Section 32 analysis report

Proposed Regional Plan for Northland

September 2017

Northland
REGIONAL COUNCIL

Contents

1 Introduction

1.1 Purpose of this report

This report is the background supporting the Proposed Regional Plan. It helps readers to understand how the Proposed Regional Plan was developed and fulfills the legal requirement of Section 32 of the RMA.

1.2 About the Proposed Regional Plan

Put simply, a regional plan sets out the rules for using resources in the region and guides how resource consent applications should be considered.

Regional plans can cover matters within the resource management functions of the regional council (outlined in section 30 of the Resource Management Act 1991), including:

- Soil conservation;
- Occupation of space in the coastal marine area;
- Water quality and quantity;
- Aquatic ecosystems;
- Biodiversity;
- Natural hazards;
- Hazardous substances;
- Discharge of contaminants; and
- Allocation of natural resources.

Regional plans must give effect to national policy statements, national planning standards and regional policy statements.

Regional plans cannot contain rules which address the effects of the discharge of greenhouse gases on climate change, except to the extent that the use and development of renewable energy enables a reduction in the discharge of greenhouse gases. This is because of a legislative policy of nationalising New Zealand's approach to the emission of greenhouse gases.

Regional plans have a significant effect on the use of natural resources within the region:

- No person may use land, water, air or the coastal marine area in a manner that contravenes a regional rule without holding a resource consent.
- District plans must be consistent with the regional plan for the applicable region.
- Consent authorities must have regard to any relevant regional plan when considering an application for a resource consent.

The Northland Regional Council currently administers three RMA regional plans:

- Regional Air Quality Plan for Northland – operative March 2003.
- Regional Coastal Plan for Northland – operative 1 July 2004.
- Regional Water and Soil Plan for Northland – operative 28 August 2004.

Section 79 of the RMA requires all provisions in a regional plan to be reviewed every 10 years. After the review, the plan(s) must go through the full Schedule 1 process (submissions, hearings etc.) regardless of whether there are changes or not.

A review of the three regional plans was completed December 2014 - see the regional council's website for more information: www.nrc.govt.nz/newregionalplan.

As a result of the review, the council decided to prepare a new single regional plan to replace the current three regional plans.

A draft Regional Plan was released for public feedback in August 2016. Feedback on the draft Regional Plan has been used to inform the proposed Regional Plan.

1.3 How to read this report

This report has been broken up into topics. Within each topic, there are sub-topics. So, for example, within the "Air quality" topic, the sub-topics are "Odour", "Spray", "Smoke" and "Dust". The sub-topics are convenient packages for evaluating management options (refer to section 1.6 'Evaluation approach' for further details). The relevant provisions addressed in each sub-topic are identified. Some provisions are covered by more than one sub-topic. A simple word search (press CTRL and "f" on the keyboard to bring up the search function) is an easy way to find where provisions are addressed.

Topic title	Sub-topic
3 Tangata whenua values	3.1 Effects on tangata whenua and their taonga 3.2 Places of significance to tangata whenua
4 Water quality	4.4 Freshwater quality objectives and limits 4.5 Coastal water quality standards 4.6 Wastewater discharges from public and on-site treatment systems 4.7 Stormwater discharges 4.8 Farm wastewater discharges 4.9 Exclusion of livestock from water bodies and the coastal marine area 4.10 Land disturbance activities 4.11 Other discharges
5 Water quantity	5.2 Freshwater quantity objectives and limits 5.3 Taking and use of fresh water 5.4 Land drainage and river control activities
6 Wetlands and beds of lakes and rivers	6.3 Dams, diversions, and fresh water structures 6.4 Wetlands
7 Air	7.3 Odour 7.4 Spray 7.5 Smoke 7.6 Dust
8 Coastal	8.3 Moorings 8.4 Structures, use and development 8.5 Anchorages and anchoring

Topic title	Sub-topic
	8.6 Aquaculture 8.7 Reclamations 8.8 Surf breaks 8.9 Dredging and disturbance 8.10 Marine pests 8.11 Mangroves 8.12 Marinas 8.13 Coastal occupation charging
9 Significant natural and historic heritage	9.3 Historic heritage 9.4 Outstanding and significant natural areas
10 Natural hazards	10.4 Flood hazard risk 10.5 Coastal hazard risk
11 Hazardous substances, contaminated land and solid waste	11.3 Solid waste 11.4 Hazardous substances and contaminated land
12 Catchment areas	12.1 Pastoral hill-country erosion in priority catchments 12.2 Water takes from lake Waiporohita (Doubtless Bay) 12.3 Managere catchment stock exclusion 12.4 Mangere catchment water quantity limits 12.5 Whangarei harbour stock exclusion 12.6 Afforestation and setbacks in outstanding Pouto lake catchments 12.7 Water takes from Pouto peninsula lakes

1.4 Development of the Proposed Regional Plan

Deciding what goes into the Regional Plan

Proposed Regional Plan

The regional council approved the release of the Proposed Regional Plan for notification at its 22 August 2017 meeting.

The development of the Proposed Regional Plan was overseen by a group of all the regional council councillors and three members of the regional council's Te Tai Tokerau Māori Advisory Committee Working Party.[1] It involved a series of eight workshops where recommendations from staff were considered, mainly in response to public feedback on the draft Regional Plan. The group, upon the completion of the workshops, made a recommendation to the regional council to approve the Proposed Regional Plan for notification.

There were some provisions which the Te Tai Tokerau Māori Advisory Working Party members did not support in the recommendation to approve the Proposed Regional Plan for notification, in particular the members did not agree with:

- the non-inclusion of provisions to regulate genetically modified organisms
- the inclusion of the rule that permits the discharge of road dust.

Draft Regional Plan

The regional council's Regional Policy Committee was delegated the responsibility to develop the draft Regional Plan. The Regional Policy Committee was made up of all the councillors of the regional council. It also had the ability to co-opt additional members with particular expertise. The Regional Policy Committee co-opted two members of the regional council's Te Tai Tokerau Māori Advisory Committee, to assist with considering and determining the Māori-specific content of the draft new regional plan.

The Regional Policy Committee approved the preparation of a single draft regional plan in December 2014. This was on the back of finishing the review of the current regional plans (see www.nrc.govt.nz/Your-Council/Council-Projects/New-Regional-Plan/10-year-review-of-the-regional-plans for more details).

The Regional Policy Committee considered material and recommendations from staff at over 25 workshops spanning from February 2015 to June 2016. The workshops were broken into two groups.

The first group of workshops focused on getting high level direction on provisions. A template was used to present the information and recommendations to the Regional Policy Committee. The template was called a 'decision sketch', and was based on the 'structured decision-making' approach to evaluating options and making choices (see www.structureddecisionmaking.org for more information). The second group of workshops were on the specific provisions. Like this report, the workshops were based on topics (refer to section 1.3 'How to read this report' for more information about the topics).

The Regional Policy Committee approved the release of the draft Regional Plan and this report at their meeting on 18 July 2016.

Catchment plans

1 *The Te Tai Tokerau Māori Advisory Committee Working Party members were involved because of their expertise and understanding of Māori values. Their views did not necessarily reflect the collective or individual views of iwi, hapu, whanau or individual Māori landowners.*

Local catchment groups (formed from community, industry and tangata whenua representatives) developed catchment plans to tailor the way fresh water is managed in five priority catchments – Mangere, Doubtless Bay, Waitangi, Poutō and Whangārei. The catchment plans included recommended rules specific to the catchment, which have been included in the Proposed Regional Plan (Section E). For more information about the catchment plans, visit: www.nrc.govt.nz and search "catchment plans".

Community, stakeholder and tangata whenua engagement

The draft Regional Plan and draft catchment plans were released for feedback on 8 August 2016 and ran for nearly seven weeks, closing on 23 September. Council received feedback from 288 submitters on the draft Regional Plan. For more information refer Draft Regional Plan - Summary of Feedback, October 2016.

Informal drop-in sessions were held around the region during August and September 2016, where staff were available to answer questions on the draft Regional Plan and draft catchment plans. The drop in sessions on the draft regional plan were held in venues in Kaitāia, Kaikohe, Kerikeri, Dargaville, Whangārei and Kaiwaka. Drop in sessions on the draft catchment plans were held at venues in all five priority catchments (Mangere, Doubtless Bay, Waitangi, Whangārei Harbour and Poutō).

Two regional hui were also held in response to expressions of interest from tangata whenua. The hui were held at Otiria Marae, Moerewa on 17 October 2016 and at regional council offices, Water Street, Whangārei on Wednesday 19 October 2016. The notes from the hui can be found at www.nrc.govt.nz/Your-Council/Council-Projects/New-Regional-Plan/drop-in-sessions/.

At its March 2016 meeting, the Te Tai Tokerau Māori Advisory Committee confirmed the establishment of a nine member Māori Technical Working Party (the working party) to provide input into the development of the Regional Plan. The working party met three times – 29 September, 27 October and 24 November 2016. A report outlining the working parties recommended changes to the Regional Plan was presented to council at a workshop on 14 February 2017.

The review of the current regional plans included a series of topic based workshops attended by key stakeholders and tangata whenua, and tangata whenua focused consultation which included three regional hui and an issues and options report (see www.nrc.govt.nz/Your-Council/Council-Projects/New-Regional-Plan/10-year-review-of-the-regional-plans for more details).

During the preparation of the draft and proposed Regional Plan, staff have had discussions and liaised with a range of different groups and people, to varying levels, including:

- Northland dairy industry liaison group;
- Northland dry stock liaison group;
- RMA Northland Forestry Development Group;
- Whangārei, Kaipara and Far North district councils;
- Far North Holdings;
- Aquaculture New Zealand
- Auckland Yacht and Boating Association;
- Ministry for Primary Industries;
- Refining New Zealand;
- Surfbreak Protection Society
- Northport;
- Department of Conservation; and
- Heritage New Zealand.

Engagement with iwi authorities

Section 14(4A) of the RMA is a recent addition (April 2017) which requires the Section 32 report to include:

1) a summary of all advice concerning the proposal received from iwi authorities under the relevant provisions of Schedule 1; and
2) a summary of the response to the advice, including any provisions of the proposal that are intended to give effect to the advice.

This section fulfills that requirement.

Advice from iwi authorities for the development of the Draft Regional Plan was received through the following processes:

- A series of workshops were held in October 2014 on specific resource management issues. Iwi representatives attended the workshops. A workshop was held on tangata whenua participation in resource management.
- Three regional hui were held in Whangarei, Kaikohe and Kaitaia in November, involving representatives from the district and regional councils. These hui focussed primarily on understanding the environmental issues of concern to tangata whenua and included discussion on the regional plan reviews.
- Tangata whenua submissions to the Draft Plan.

The advice received was generally that:

- Iwi and hapū management need to be appropriately taken into account in plan changes, and regard had for them in consent processes
- Tangata whenua engagement in consent processes needs to be effectively enabled
- Tangata whenua notification processes for consent applications was inadequate
- There are priority natural environmental resource management issues for tangata whenua

A Draft Issues and Options paper was developed which included response to advice received through the workshops and hui. The iwi and hapū management plans lodged with the council were taken into account in developing the Draft Issues and Options paper. The paper was circulated widely in the Taitokerau tangata whenua community for feedback. Feedback received was incorporated into the final paper.

A set of tangata whenua provisions was developed to implement the proposals in the Issues and Options paper. These included:

- A consent processing policy for analysis of impacts on tangata whenua and their taonga which:
  - Is triggered by issues of significance to tangata whenua
  - Has regard to relevant iwi and hapū management plans
  - Sets out a method for undertaking the analysis
- Tangata whenua notification requirements for consent applications are specified
- A policy for protection of places of significance to tangata whenua
- A policy setting out a method for identification and description of places of significance to tangata whenua
- Relevant rules relevant to tangata whenua priority issues ensure those matters are able to be addressed

The proposed tangata whenua provisions were considered by the council's Regional Policy Committee, which made recommendations to the council. Members of the council's Te Taitokerau Maori Advisory Committee were included in the Regional Policy Committee meetings on the Draft Regional Plan, and had voting rights for decisions on recommendations.

The tangata whenua submissions to the Draft Regional Plan were considered, and the provisions amended in response where relevant. Amended tangata whenua proposals were presented to a council workshop which three members of the council's Te Taitokerau Maori Advisory Committee attended with voting rights on recommendations.

1.5 Structure and content of the Proposed Regional Plan

The proposed Regional Plan is a single regional plan that covers all of the regional council's resource management functions.

The basic structure of the plan is:

- Definitions
- Rules
- Policies
- Catchments
- Objective

We (the regional council) have taken the position that the purpose of the Regional Plan is a rule book and a set of policies to guide resource consent processes. It contains very little optional content such as issues, explanations, methods (other than rules) and assessment criteria. The following table outlines the common optional content and the reason why it hasn't been included:

Optional plan content

Optional content	Reason why it hasn't been included
Issues	Of little value for guiding resource consent decision making. For those interested in the 'issues' (i.e. the problem, opportunity and/or requirement) they can refer to the Section 32 report.
Methods (other than rules)	• Non-regulatory methods are generally addressed through the Long Term Plan or Annual Plan. We decided to keep non-regulatory methods out of the regional plan to give greater flexibility. The greatest determinant of implementing non-regulatory methods is funding - therefore we think it makes more sense that the decisions about non-regulatory methods happen at the same time and place as decisions about funding. • The current regional plans have many non-regulatory methods that haven't been implemented because of changing council priorities. • Methods tend to attract a disproportionate amount of attention through the Schedule 1 process, which is an unnecessary cost to council and participants.
Explanations	Good policy doesn't need explaining. A policy should be clear in itself. Explanations are not determinative of resource consents. Also explanations tend to attract a disproportionate amount of attention through the Schedule 1 process – an unnecessary cost to council and participants.
Assessment criteria	Any criteria important for guiding resource consent applications can and should be included in policy.
Environmental results anticipated	Better that these sit outside the plan (for example, in a monitoring strategy) so they can be flexible. Science and monitoring techniques change, as does the funding to do it.
Procedures for monitoring policies and methods	See comments for "Environmental results anticipated".

Optional content	Reason why it hasn't been included
Information to be included in a resource consent application	This information can just as easily be included in material outside the plan. Also there's more flexibility for it being outside the plan – information requirements can change over time.
Processes for dealing with cross boundary issues between territorial authorities and regions	These have been addressed in the Regional Policy Statement.

Objectives

We decided to (essentially) not include objectives in the regional plan. The RMA requires regional plans to include objectives. Therefore, we've included just one intentionally high level objective (which paraphrases Section 5 (the purpose) of the RMA.

We don't think it's necessary to include objectives (other than the one legally required) because:

- Higher policy documents (for example the Regional Policy Statement) already contain objectives – there's often little opportunity or need to add value/detail.
- Objectives seldom turn resource consent decisions.
- While the RMA (and planning theory) assumes that objectives drive policies and rules, the reality is when developing plans, policies and rules drive objectives. The debate over rules seldom starts with the objectives or policies – it starts with the rules. If the objectives or policies don't match the rules then the objectives or policies are changed.
- The outcomes (objectives) sought by the rules and policies are in the Section 32 report.

The conventional purpose of objectives is:

"...a statement of what is to be achieved through the resolution of a particular issue. Objectives clearly state what is aimed for in overcoming the issue or promoting a positive outcome, or what the community has expressed as being desirable in resolving an issue[(2)]."

Objectives set the direction for the policies, rules and other methods. In theory this make sense – but the reality is it doesn't work like that.

The primary focus of the plan for most people is the rules. This is what most people are interested in because this is where the rubber hits the road. In practice the debate over rules seldom starts with the objectives or policies – it starts with the rules.

The debate about rules inherently is about the trade-offs of values (for example, environmental impact vs cost to developer, certainty vs flexibility, cost to developer vs public participation and cost to ratepayer vs cost to developer). It's these values and the extent to which they are traded off that are the true 'objectives'. Here's a hypothetical example to illustrate:

There's a proposed rule to make all stock access to waterways greater than 1 metre wide a discretionary activity and less than 1 metre wide a permitted activity. The key values at stake are water quality vs costs to farmers. Evidence suggests that if this rule is implemented, water quality would be improved by 30% and the average cost to a farmer to fence to comply is $50,000. Parties on opposing sides put up their arguments and a final decision gets made that the width be increased to 1.5 metres – this would result in a 20% improvement in water quality at an average cost of $30,000 per farmer. These are the 'objectives' – improve water quality by 20% and keep average cost to farmers below $30,000.

Some may argue that the objectives (improve water quality by 20% and keep average cost to farmers below $30,000) should have been determined first and then the policies and then rules. But that doesn't reflect the real world – you can't separate values (objectives) from consequences (policies and rules). We can't get to a point of 20% and $30,000 without understanding how it will be achieved and why. People won't sign-up to an objective if they don't know how it will affect them.

2 *Quality Planning – The QP website is the primary tool for delivering robust information on RMA processes and environmental policy to resource management practitioners – http://www.qualityplanning.org.nz/*

Of course you could have a couple of high level objectives that talk about improving water quality and minimising costs to farmers. But these are meaningless because they don't deal with the crunchy issue of trading off the two values.

So the question is, why do we need objectives if they are inherently determined by the decisions made on the rules and policies? One argument is that they are needed to show the outcomes the policies and rules are seeking to achieve. We don't agree. Firstly very few readers of an operative plan want to know the background to particular provisions. Secondly, the story behind the provisions is the Section 32 report. It's therefore important that the Section 32 report clearly shows how values have been traded off - which is what we have hoped to achieve in this Section 32 report.

Policies

Conventionally policies in a plan set the course of action to achieve objective(s). They generally do this by:

- Directing rules (for example activity status or conditions);
- Directing the methods signalling non-regulatory actions; and
- Guiding decision-making on resource consent applications.

We don't think a plan needs policies to direct rules or other methods. Therefore the Proposed Regional Plan only includes policies that guide decision making.

Policies that provide the basis for rules serve little value. Firstly, rules need a basis, but it doesn't need to be in the plan[3]. The (policy) basis for rules is the s32 report. Very few readers of an operative plan want to understand the rationale behind rules. If they do, then that's what the s32 report is – and it tells the whole story. Secondly, while in theory the development of rules starts with the objectives then policies, the reality is that people operate the other way round.

Assuming the new regional plan will generally not include methods (other than rules), there's no need for policies to signal council non-regulatory actions.

Another feature of the Proposed Regional Plan is that it doesn't repeat policies that are already covered by the Regional Policy Statement or a National Policy Statement. Traditionally, plans have attempted to rephrase policies stated in higher level planning documents. However, such policies end up looking very similar in their wording (and nearly identical in their application) to the higher level policy. There are now five operative national policy statements and a new Regional policy Statement that include a raft of prescriptive policy. If we can't add any value, then we can just rely on the policy in these documents (they have the same weight as policy in a regional plan). The one exception is policy necessary for non-complying activities.

Resource consent applications for non-complying activities are treated differently to applications under other rule classifications. Section 104D, RMA says that a resource consent cannot be granted for a non-complying activity unless the adverse effects on the environment are minor *or* the activity will not be contrary to objectives and policies in the relevant regional plan(s). It's therefore necessary that the regional plan contain policies that clearly set out the expectations of activities in the circumstances of a non-complying activity. The way we've addressed this, in circumstances where we believe we can just rely on higher level policy, is to have a policy referencing the relevant high level policy that needs to be applied for a Section 104D test (see policy D.2.2).

Rules

To cater to how most people use a regional plan, the Proposed Regional Plan has the following features:

- The rules are at the front of the plan;
- Rules are grouped by activity;
- Within each grouping of rules, the rules start with the most permissive through to the most restrictive (people generally want to know the least restrictive rule for their activity, or what they need to do meet the least restrictive rule);

3 *There are legal requirements - rules have to be linked to policies, but this can be worked around (hence D.2.1 which is a high level policy which provides the legally required link to the rules).*

- 'Bundled' rules. Rule bundling is used in this plan to combine several permissions which may be required under section 9 and sections 12 to 15C of the RMA into one rule; and
- Within each rule, the relevant section of the RMA is referenced (section 9 and/or sections 12 to 15C). This makes it clear what RMA permissions the rule covers.

Catchments

The regional council ran a programme to prepare catchment management plans to improve water management in five priority catchments – Mangere, Waitangi, Doubtless Bay, Whangārei and Poutō. Each catchment management plan was developed by a catchment group, which contain representatives of tangata whenua and stakeholders. The catchment management plans include a suite of recommended rules for the regional plan. Council approved the inclusion of the rules (unchanged) into their own section in the Proposed Regional Plan. The catchment rules trump the other rules in the Proposed Regional Plan (whether more or less restrictive).

See www.nrc.govt.nz/Your-Council/Council-Projects/Waiora-Northland-Water/Priority-areas for more information about the catchment groups and their work.

1.6 Evaluation approach

Overview

The evaluation has been broken up into topics. Within each topic, there are sub-topics - and the evaluations are generally done at this level. So, for example, within the "Air quality" topic, the sub-topics are "Odour", "Spray", "Smoke" and "Dust". The sub-topics are convenient packages for evaluating management options (refer to section 1.3 'How to read this report' for details about the topics).

For each sub-topic we start by outlining the context - the legal situation; relevant policies; and the problem, opportunity and/or requirement. We then outline the various management options (packages or policies and rules) and then screen out any that are not viable or relevant. The evaluation of the management options uses a multi-criteria analysis approach. Put simply, multi-criteria analysis is scoring options against a set of criteria. It is a commonly used approach for evaluating options [(4)] .

There are various ways multi-criteria analysis can be done. We've adopted an approach based on the 'structured decision-making' approach (see www.structureddecisionmaking.org for more information). A detailed explanation of the approach is covered in the "High level objectives and measures" and "Evaluating the management options" section below. Key features of this approach are:

- The 'criteria' are a set of what we've called "high level objectives" and related measures. The high level objectives capture the fundamental things (or values) that matter to people when determining the best management option, and signal a direction for where we want to head, without stating how far we go - for example "Minimise the cost to developers". The measure is a metric for the high level objective and are used to test the management options against - for example "costs of obtaining resource consent".
- The outcomes we want to achieve (objectives) and management options are assessed all at the same time. This recognises that understanding consequences (for example, rules) is necessary for determining acceptable objectives. The standard practice is to develop and test objectives first, and then test the effectiveness of the management options (policies and rules) against their ability to achieve the objectives.
- Only the fundamental things that matter to people in determining the best management option are identified (rather than identifying all the potential impacts – often identified costs and benefits are not material for deciding the best management option).

This Section 32 report follows a standard template - refer Appendix 1. The following explains each section of the template and covers the evaluation approach in more detail:

Executive summary

Self explanatory.

Relevant provisions

The relevant policies and rules in the Proposed Regional Plan the evaluation supports.

Legal background

A brief description of key aspects of the RMA and any other relevant legislation for the topic. The focus is on legal aspects which are particularly relevant for the topic.

Planning documents

Covers key aspects of the planning context for the topic, including any relevant national policy statements, the Regional Policy Statement, and iwi/hapū management plans.

4 *A guide to section 32 of the Resource Management Act, Ministry for the Environment, 2017*

The problem, opportunity and/or requirement

This section provides an overview of the state and management of the resource(s). Problems may be with the state of the resource and or with the way it's managed. Opportunities could be, for example, economic opportunities (for example, where there is known commercial demand for a resource but it's use is limited by the current rules). In many situations, the reason we need certain rules and policies in a regional plan is because it's a requirement (for example, directed by national policy statements or the regional policy statement).

Management options

Management options are packages of policies and rules. We have used a packaging approach because it recognises that the solutions to the problem, opportunity and/or requirement generally require a package of interrelated policies and rules. For example, the successful management of moorings may include rules to permit moorings in designated mooring areas and policies to guide decision makers for mooring resource consent applications outside of designated mooring areas.

The management options in this section should include all the options that we know about, for example identified from consultation, strategic documents, research and approaches used by other councils. The management options should also represent the spectrum of approaches, for example, from highly regulated to minimal regulation.

Section 32(2)(c) requires the assessment to "*...assess the risk of acting or not acting if there is uncertain or insufficient information about the subject matter of the provisions.*" This is covered by including a management option of doing nothing relevant and viable.

Screening the management options

The next step is to screen the management options to filter those that are clearly not relevant or viable. To be relevant, management options need to:

- Relate to the problems, opportunity and/or requirement;
- Be within scope of council's functions; and
- Be consistent with higher level documents (for example, RMA Part II, national policy statements and the regional policy statement).

Viability generally comes down to cost. If the cost is clearly untenable then the option can be discounted (for example, if the costs were so high as to make an existing industry commercially unviable).

High level objectives and measures

Section 32 requires an assessment of "*...the efficiency and effectiveness of the provisions in achieving the objectives...*". Our evaluation approach does this by assessing the management options against a set of high level objectives and measures.

'High level objectives':

- Capture the fundamental things (or values) that matter to people when determining the best management option. These are generally the things that the management options may have significant impacts on and the impacts vary between the management options. There is little point considering something that the management options all have the same or similar impact on because it doesn't assist with the job of deciding between the management options.
- Signal a direction for where we want to head, without stating how far we go – that comes later (they are not 'objectives' as referred to in the RMA, but are the beginnings of objectives).

'Measures' make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against. The measure relates specifically to the subject of the high level objective. So, for example, if the high level objective was to minimise compliance cost to resource users, the measure could be the cost of applying for resource consent.

Also included is an explanation of how we've determined the measure. These might include technical reports, feedback from workshops or expert judgement. It's important to be clear about the information source for the measure as it indicates the level of certainty we have about the measure and the assessment. The first option for a measure and the information source is that it be quantifiable[5]. The reality is, it can be very difficult and/or expensive to quantify impacts.

5 *Section 32(2)(b).*

Section 32 requires an assessment of the impacts on economic growth and employment opportunities (s32(2)(a)). Generally it hasn't been included as a high level objective – for more information refer to 1.7 'Assessing impacts on economic growth and employment opportunities'.

Section 32 requires that the report "*...contain a level of detail that corresponds to the scale and significance of the environmental, economic, social, and cultural effects that are anticipated from the implementation of the proposal...*". This is reflected in the:

- Range of high level objectives;
- Accuracy and specificity of the measures; and/or
- Reliability of the information source.

Evaluating the management options

The next step is to evaluate the management options against the high level objectives.

Certainty about the evaluation

There is always uncertainty about the potential impacts of management options. We are trying to predict what will happen in the future if we were to implement each management option. We don't often know what and where demand for resources will be, getting better information can be too expensive, and many of values we have can't be scientifically quantified.

Therefore we often have no choice but to make 'best guesses'.

It's important that we recognise and understand the level of certainty we have about potential impacts when making decisions about options, particularly when it comes to significant impacts. It's also important to consider the feasibility of getting more information to increase certainty. It may not be necessary to get information to increase the accuracy of our evaluation. For example, where there is little difference in the measure between the management options or where the impacts are not anticipated to be significant.

Time-frame of the evaluation

The impacts and effectiveness of management options will differ over time and their may be lags – it may take a while for actions to take effect and to start generating benefits. For example, a restriction on fertiliser application may take some years before there's a corresponding improvement in water quality. Also, there may be a threat which has yet to occur, for example a tsunami. Lastly, there may be a lag while people change their behaviour.

For the purposes of the evaluation, a point in time is chosen where we would expect the majority of changes anticipated to occur. Where there is no time lag of impacts, generally the life of the plan is chosen as the time-frame for evaluation (10-15 years).

The preferred management option

The preferred management option may be immediately obvious, but often it won't. It will generally come down to a trade-off of usually two competing values (for example, risk to the environment vs cost to developers). The weight given to any particular value is a judgement call. This reflects the reality that we are often dealing with 'apples and oranges' and therefore it's a value based judgement. The judgement call however still needs to be justified and will generally be guided by factors like certainty of information, the risk of adverse impacts, and national direction.

1.7 Assessing impacts on economic growth and employment opportunities

Assessing the effects of provisions on economic growth and employment opportunities has been specifically incorporated into section 32 of the Resource Management Act 1991 (RMA). Clause (2) states that an assessment of the efficiency and effectiveness of the provisions in achieving the objectives "must:

> *(a) Identify and assess the benefits and costs of the environmental, economic, social and cultural effects that are anticipated from the implementation of the provisions, including the opportunities for –*
>
> > *(i) economic growth that are anticipated to be provided or reduced; and*
> >
> > *(ii) employment that are anticipated to be provided or reduced; and*
>
> *(b) if practicable, quantify the benefits and costs referred to in paragraph (a).*

However, while economic growth and employment are specifically mentioned for consideration, there are three qualifiers provided in the legislation, in that:

1) They are just part of the overall assessment of effects, with no additional weighting being given to them above other effects (sub-clause (2)(a));
2) As with all effects, the quantification of them is limited to where it is practicable to do so (sub-clause (2)(b)); and
3) again as with all effects, the level of detail that is expected corresponds to the scale and significance of the effects that are anticipated (sub-clause (1)(c)).

The Ministry for the Environment (MfE) has published guidance to assist practitioners and decision-makers undertake good practice section 32 evaluations.[6] The guidance recommends that reporting on economic growth and employment effects should be done separately from the evaluation of provisions. This recommendation is made because while higher levels of economic output and employment are generally considered beneficial for the community, an increase in GDP or employment cannot automatically be considered a benefit. This is because economic activity includes both benefits and costs – additional activity incurs additional resource inputs, employment includes the time and energy input of the person employed. The shares of economic activity and employment that can be considered a benefit are difficult to measure.

Furthermore there are often practical difficulties in predicting the effects of proposals on GDP and employment. Establishing the link between some of the likely economic impacts, for example, cost to resource user, and GDP and employment is tenuous in many cases. For other economic impacts that can be measured, such as the area of land effected, a number of assumptions have to be made to assess the resulting GDP and employment impacts, for example, level of production per hectare and the returns achieved per unit of output. It is more appropriate to make the assessment based on the more certain measure.

Based on the above, the section 32 evaluation report assesses the economic growth and employment effects of the new plan provisions as follows:

1) Economic growth and employment effects (measured in terms of GDP and employment) is not specifically included in the assessment of the provisions. The assessment of effectiveness and efficiency is based on high level objectives that capture the fundamental things (or values) that matter to people when determining the best management option. This does not mean that economic effects will not be taken into consideration. Often they will be in terms of an evaluation cost to resource users. Other times a proxy such as area affected may be used. But the impact of these effects on economic growth and employment is not included in the evaluation of the alternative proposals as specific objectives against which the policy options will be assessed.

6 *Ministry for the Environment, 2014. A guide to section 32 of the Resource Management Act.*

2) Where it is practicable, and the scale and significance of the potential effects justifies it, an assessment of the effects on economic growth and employment (measured in terms of GDP and employment) is provided as part of the discussion on the preferred management option.

3) To assist assessing the scale and significance of the plan provisions, the evaluation may also contain information regarding the potential economic impacts of other events outside the plan provisions. This will assist in showing the relative impact of plan provisions vis-á-vis other events/happenings that impact on the Northland economy on a regular basis. Some of the possible events and their potential impacts are shown in the following table.

Table 1: the impact of various events on Northland's economy.

Event	Impact of the event on:		
	Price	Quantity	Value of output
Tariff relief associated with the Trans Pacific Partnership trade agreement on kiwifruit industry.	Savings of over $1000 per hectare.	422ha of kiwifruit was harvested in Northland during the 2014/15 season.	$422,000
An additional cruise liner visits the Bay of Islands.	Each passenger spends on average $270 during the visit.	The average cruise liner visiting the Bay of Islands in the coming 2015/16 season will carry 1900 passengers.	$513,000
A fall in the NZ/USD exchange rate improves the return for exporters, for example, the dairy industry.	A total of 89 million kilograms of milk solids was produced in Northland during the 2013/14 season.	A USD 0.01c depreciation of the exchange rate (for example, from USD 0.68c to 0.67) increases the dairy payout price by 10c/kg milk solids.	$8,900,000

2 Statutory acknowledgements and iwi/hapū management plans

Statutory acknowledgements[1]

Statutory acknowledgements are statements in Treaty of Waitangi settlements between Crown and tangata whenua (generally iwi) that are intended to recognise the mana of tangata whenua groups in relation to identified sites and areas.

Statutory acknowledgements are an acknowledgement by the Crown of the particular cultural, spiritual, historic, and traditional association of an iwi with each statutory site and area.

Text for statutory acknowledgements is included in the schedules to each relevant Claims Settlement Act. The locations for statutory acknowledgement areas are shown on Survey Office (SO) plans. While these plans do not indicate the precise boundaries of the statutory acknowledgement area, they do indicate the location as nearly as possible.

Statutory acknowledgements are only over Crown land and may apply to land, rivers, lakes, wetlands, a landscape feature, or a particular part of the coastal marine area. Where a statutory acknowledgement relates to a river, lake, wetland or coastal area, it only applies to that part of the bed in Crown ownership or control.

In terms of RMA processes, the main implication for statutory acknowledgements is for resource consent applications. While the only legal requirements with regard to statutory acknowledgements in the preparation of plans is to attach them to the plan, they provide a clear statement of the interests of tangata whenua that can be used to inform plan preparation.

For example, statutory acknowledgements can be used to:

- Create a starting point for consultation;
- Assist in drafting plan provisions;
- Identify activities/circumstances in which the iwi authority may consider waiving its right to receive summaries of applications, for example, where particular activities are not considered to affect the associations identified in the statutory acknowledgement;
- Using controlled, restricted discretionary and discretionary activity status where activities are likely to result in adverse effects on particular sites or issues of concern identified in the statutory acknowledgement, which can include the requirement to obtain written approval from the claimant group; and
- Identify areas of importance to an iwi, or where consultation with iwi is to be encouraged through their incorporation into planning maps, or alert layers within GIS.

Statutory Acknowledgements in Northland

Treaty of Waitangi settlement legislation has been enacted for several iwi and hapū within the Northland region:

- Te Uri o Hau
- Te Roroa
- Ngati Manuhiri
- Ngati Kuri
- Te Aupouri
- Ngai Takoto
- Te Rarawa

Details about the statutory acknowledgements can be found in the respective settlement legislation for each iwi or hapū.

Rather than attaching statutory acknowledgements to every plan and regional policy statement, the approach taken by the regional council is to have a single companion document recording all statutory acknowledgement areas – "*Te Ture Whakamana nga Iwi o Taitokerau - Statutory acknowledgements in Northland*". This can be found on the regional council's website.

1 *Much of the commentary in this section is based on the guidance material from www.qualityplanning.org.nz*

Iwi/hapū management plans

An iwi/hapū management plan is any planning document recognised by an Iwi Authority (the authority that represents an iwi and that is recognised by that iwi as having authority to do so).

Iwi/hapū management plans may be formal planning documents similar to council policy documents, or they may be a statement of iwi policies in a less formal and detailed memo or report. Plans may be be developed by iwi, hapū or whānau and provide a statement on the position of the tangata whenua on a range of issues so that these can be heard and considered by councils and other stakeholders.

In some instances, iwi management plans may be written in a holistic manner and may go more broadly than RMA requirements and include social, economic and health issues. They could also be a statement on the iwi interests in relation to one resource such as fresh water or a particular site.

Iwi/hapū environmental management plans provide a vision of how the management and protection of natural and physical resource can be achieved based on cultural and spiritual values of tangata whenua.

There are a range of sections within the Resource Management Act (RMA) that provide for Māori interests. When preparing regional plans, regional councils are required to "*...take into account any relevant planning document recognised by an iwi authority and lodged with council*" under 66(2A)(a) of the RMA .

The following is a list of those iwi and hapū who have developed environmental management plans (recognised by an iwi authority) and formally lodged them with the regional council.

Ngātiwai Trust Board

Te Iwi o Ngātiwai Iwi Environmental Policy Documents 2007

Ngātiwai Aquaculture Plan 2005

Te Rūnanga o Ngāti Rehia

Ngati Rehia Environmental Management Plan 2007 (updated 2015 yet to be formally lodged with council)

Patuharakeke Te Iwi Trust Board

Hapū Environmental Management Plan 2015

Te Rūnanga o Ngāti Hine

Ngā Tikanga mo te Taiao o Ngāti Hine 2008

Kororareka Marae

Kororareka Marae Environmental Hapū Management Plan 2009

Te Uri o Hau Settlement Trust

Te Uri o Hau Kaitiakitanga O Te Taiao 2012

Ngāti Kuta

Whakatakoto Kaupapa Mo Te Hapū o Ngāti Kuta ki Te Rawhiti

Ngā Hapū o Te Wahapū o Te Hokianga Nui A Kupe

(Ngāti Korokoro, Ngāti Wharara, Te Poukā) Hapū Environmental Management Plan 2008

Te Rūnanga o Whaingaroa (Te U Kaipo RMU)

Kia Matau, kia mohia e ora ana Te U Kaipo 2011

Ngati Hau

Ngati Hau Environmental Management Plan 2016

Te Uriroroi, Te Parawhau and Te Māhurehure ki Whatitiri

Whatitiri Resource Management Plan 2016

3 Tangata whenua values

3.1 Effects on tangata whenua and their taonga

3.1.1 Executive summary

This section considers options for provisions for processing of resource consents to ensure effects on tangata whenua and their taonga are appropriately managed.

The RMA in Schedule 4 requires an assessment of cultural effects and effects on cultural values. However, without focus on priority resources and activities which concern tangata whenua, in practice these can be easily overlooked. Effective engagement of tangata whenua in the assessment process is necessary. Without a defined process for the assessment, the evidential value of the results of that analysis are difficult to evaluate.

These provisions also respond to engagement issues identified by tangata whenua in the Regional Policy Statement and which are included in many iwi planning documents lodged with the council.

Insufficient engagement of tangata whenua and the failure to identify issues and potential impacts on their values can lead to inappropriate management with more than minor adverse effects resulting. The provisions of this section aim to address that problem.

By undertaking an analysis which requires, as does the policy, to "*identify, where possible, how to avoid, remedy or mitigate the more than minor cultural effects of the activity*" a proactive approach to managing impacts will be developed prior to lodging the consent. This will greatly reduce the risk of challenges and delays during the consent process, and a consequent potential savings in costs of hearings, appeals and costs from delays in project implementation.

The preferred option is Option 2:

Guidance on how to assess effects on tangata whenua values	Identifying when an assessment of effects is required	Activities which effects on tangata whenua values to be considered
Included in plan.	Assessment required for significant tangata whenua values. Case-by-case for all others.	All discretionary activities, and all restricted discretionary and controlled activities that that have been determined to be relevant.

This option:

- Gives effect to the Regional Policy Statement;
- Takes into account iwi planning documents;
- Gives effect to national policy statements;
- Gives direction for Schedule 4 implementation;
- Recogniss other relevant legislation;
- Provides a framework for protection of tangata whenua values; and
- Aims to minimise costs of implementation.

3.1.2 Relevant provisions

- Policy D.1.1 When an analysis of effects on tangata whenua and their taonga is required
- Policy D.1.2 Determining whether effects on tangata whenua and their taonga is likley

- Policy D.1.3 Requirements of an analysis of effects on tangata whenua and their taonga
- Policy D.1.4 Affected parties

The parts of the following rules that refer to "effects tangata whenua and their taonga" as a matter of control or discretion

- C.1.6.1 Unlawful public road reclamations – controlled activity
- C.4.2.1 Wet weather wastewater discharge from a pump station or pipe network – controlled activity
- C.5.1.6 Existing dairy shed use – controlled activity
- C.5.1.7 Application for a new water permit where a consent is due to expire – controlled activity
- C.5.3.5 Re-consenting flood control schemes – controlled activity
- C.5.3.6 Land drainage schemes for which there is no approved management plan – controlled activity
- C.2.6.4 Construction, maintenance, alteration, decommissioning and closure of a bore that is not a permitted or controlled activity – restricted discretionary activity
- C.3.2.4 Wetland construction, alteration or extension – restricted-discretionary activity
- C.5.2.5 New dam (intermittently flowing) – restricted discretionary activity

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3.1.3 Legal background

Resource Management Act

Section 6(e) in Part 2 of the RMA requires that "*the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga*" be recognised and provided for as a matter of national importance. Section 6(f), historic heritage, and section 6(g), protected customary rights, must similarly be recognised and provided for.

Kaitiakitanga must be given particular regard to under section 7(a).

Section 8 requires that the principles of the Treaty of Waitangi (Te Tiriti o Waitangi) be taken into account. These principles have not been defined in legislation, although the Courts and the Waitangi Tribunal have endeavored to extrapolate the practical implications of the "principles" in relation to the factual circumstances of the particular proceedings and claims before them. RMA case law has clarified that Section 8 that recognises the relationship of tangata whenua with natural and physical resources and encourages active participation of, and consultation with, tangata whenua in resource management decision-making.

Legal definition of the requirement to "recognise and provide for" in section 6 means that councils must make provision for the relationship of Māori with their ancestral lands, water, sites, waahi tapu, and other taonga, and anticipates a positive action by decision-makers. The requirement to "have particular regard to kaitiakitanga" in section 7 means that this matter must be given genuine attention, consideration and appropriate weight. The requirement to "take(n) into account" in Section 8 means that it must be considered and weighed up along with all the other relevant factors.

These definitions have been taken from recent case law do not override the primary purpose of the RMA (section 5).

Section 88(3) enables a consent to be returned if there is not an adequate assessment of environmental effects.

Section 92 sets out how council can request further information on a consent application.

Section 104(1)(c) Consideration of applications, allows for inclusion of having regard to relevant iwi planning documents.

> *(1) When considering an application for a resource consent and any submissions received, the consent authority must, subject to Part 2, have regard to – ….*
>
> > *(c) any other matter the consent authority considers relevant and reasonably necessary to determine the application.*

Schedule 4 requires an assessment of environmental effects to include identification of affected parties, and an assessment of cultural effects;

6 Information required in assessment of environmental effects

(1) An assessment of the activity's effects on the environment must include the following information:

...

(e) a description of the mitigation measures (including safeguards and contingency plans where relevant) to be undertaken to help prevent or reduce the actual or potential effect:

...

(f) identification of the persons affected by the activity, any consultation undertaken, and any response to the views of any person consulted:

7 Matters that must be addressed by assessment of environmental effects

(1) An assessment of the activity's effects on the environment must address the following matters:

(a) any effect on those in the neighbourhood and, where relevant, the wider community, including any social, economic, or cultural effects:

...

(d) any effect on natural and physical resources having aesthetic, recreational, scientific, historical, spiritual, or cultural value, or other special value, for present or future generations:

Statutory acknowledgements

Refer section 2 'Statutory acknowledgements and iwi/hapū management plans' for discussion on statutory acknowledgements.

Marine and Coastal Area Takutai Moana Act 2011

Protected customary rights are identified and provided legal status by this statute.

In section 6(g), protected customary rights are a matter of national significance and must be recognised and provided for. The enactment of the statute and the amendment to include section 6(g) occurred after the regional plans became operative.

At the time of writing, there have been no protected customary rights orders granted in Northland although some applications have been lodged.

3.1.4 Planning documents

New Zealand Coastal Policy Statement

Objective 3 of the New Zealand Coastal Policy Statement 2010 requires that we "*take account of the principles of the Treaty of Waitangi, recognise the role of tangata whenua as kaitiaki and provide for tangata whenua involvement in management of the coastal environment*" through the following:

- Recognising the ongoing and enduring relationship of tangata whenua over their lands, rohe and resources;
- Promoting meaningful relationships and interactions between tangata whenua and persons exercising functions and powers under the Act;
- Incorporating mātauranga Māori into sustainable management practices; and
- Recognising and protecting characteristics of the coastal environment that are of special value to tangata whenua.

Policy 2 provides councils with direction for the implementation of Objective 3:

(f) provide for opportunities for tangata whenua to exercise kaitiakitanga over waters, forests, lands, and fisheries in the coastal environment through such measures as:

...

(iii) having regard to regulations, rules or bylaws relating to ensuring sustainability of fisheries resources such as taiāpure, mahinga mātaitai or other non commercial Māori customary fishing.

National Policy Statement for Freshwater Management

The National Policy Statement for Freshwater Management 2014 "*is about recognising the national significance of fresh water for all New Zealanders and Te Mana o te Wai.*"[1] There is one objective and one policy specific to recognising mana whenua interests in freshwater management:

Objective D1

To provide for the involvement of iwi and hapū, and to ensure that tangata whenua values and interests are identified and reflected in the management of fresh water including associated ecosystems, and decision-making regarding freshwater planning, including on how all other objectives of this national policy statement are given effect to.

Policy D1

Local authorities shall take reasonable steps to:

a) involve iwi and hapū in the management of fresh water and freshwater ecosystems in the region;

b) work with iwi and hapū to identify tangata whenua values and interests in fresh water and freshwater ecosystems in the region; and

c) reflect tangata whenua values and interests in the management of, and decision-making regarding, fresh water and freshwater ecosystems in the region.

"Reflect" is new terminology in RMA implementation, and would not appear to have legal interpretation or relevant case law. The online Oxford Dictionary defines "reflect" as "embody or represent in a faithful or appropriate way". The online Collins Dictionary has "to show or express". This would appear to be equivalent to a high level requirement – that is, more like "give effect" than "have regard to".

The work undertaken by the regional council with Ministry for Primary Industries and Ministry for the Environment [2] to identify the tangata whenua freshwater values needs to be the basis for what is to be reflected. Those values are expressed from high level overarching values through to more specific values for which regulatory responses are proposed. Councils must "take reasonable steps to reflect" these values. The operational level values identified are:

- Crystal clear water (in specific water bodies);
- Fish stocks;
- Tuna;
- Repo; and
- Safe swimming/safe drinking (in specific water bodies).

Regional Policy Statement

Relevant provisions are:

2.5: Issues of significance to tangata whenua – participation in resource management

The following issues have been identified by iwi authorities as regionally significant as they relate to tangata whenua participation in resource management:

(a) There is inadequate provision for the early and effective participation of tangata whenua as partners in regional council resource management decision-making processes affecting natural and physical resources

1 *page 6*

2 *Northland Regional Council, Ministry for Primary Industries, and Ministry for the Environment, August 2015. Northland Tangata Whenua Freshwater Values (Final Draft).*

8.1.5 Method – Statutory plans and strategies:

The regional and district councils will:

....

(b) Include an analysis of the effects of any resource consent application on tangata whenua and their taonga, including details of any proposed measures to avoid, remedy, or mitigate effects and consultation undertaken, in all regional and district council reports on resource consent applications.

2.6 Issues of significance to tangata whenua – natural and physical resources

The following issues have been identified by iwi authorities as regionally significant as they relate to the state of, and pressures on, natural and physical resources:

(a) The decline of the mauri of natural resources (in particular water and land). (See also Issue 2.1 – Fresh and coastal water);

(b) The decline of mahinga kai, particularly kai moana harvesting sites, is

impacting on the ability of tangata whenua to feed their whanau and manaaki manuhiri. (See also Issue 2.1 – Fresh and coastal water);

(c) Some tangata whenua in rural areas are drinking untreated water from streams and rivers. (See also Issue 2.1 – Fresh and coastal water);

(d) Land use and development can lead to damage, destruction and loss of access to wāhi tapu, sites of customary value and other ancestral sites and taonga which Maori have a special relationship with. (See also Issue 2.8 – Significant natural areas, features / landscapes and historic heritage);

(e) The loss of indigenous biodiversity, particularly where it negatively impacts on the ability of tangata whenua to carry out cultural and traditional activities. (See also Issue 2.2 – Indigenous ecosystems and biodiversity);

(f) The impacts of climate change. (See also Issue 2.7 – Natural hazards); and

(g) *The use of genetic engineering and the release of genetically modified organisms to the environment.*[3]

Iwi planning documents

Most iwi planning documents lodged with the council identify engagement and participation as a key issue. (This was taken into account in the Regional Policy Statement in Issue 2.5 and Method 8.1.5 as above.)

An iwi/hapū management plan is any planning document recognised by an Iwi Authority (the authority that represents an iwi and that is recognised by that iwi as having authority to do so).

Iwi/hapū management plans may be formal planning documents similar to council policy documents, or they may be a statement of iwi policies in a less formal and detailed memo or report. Plans maybe be developed by iwi, hapū or whānau and provide a statement on the position of the tangata whenua on a range of issues so that these can be heard and considered by councils and other stakeholders.

In some instances, iwi management plans may be written in a holistic manner and may go more broadly than RMA requirements and include social, economic and health issues. They could also be a statement on the iwi interests in relation to one resource such as fresh water or a particular site.

Iwi/ hapū environmental management plans provide a vision of how the management and protection of natural and physical resource can be achieved based on cultural and spiritual values of tangata whenua.

3 *There is currently an appeal challenging the RMA jurisdiction of genetic engineering (relevant to Issue (g)). If through the appeal it is found that there is RMA jurisdiction for genetic engineering other points of appeal may be pursued and may affect this issue.*

There are a range of sections within the Resource Management Act (RMA) that provide for Māori interests. In relation to iwi management plans, regional councils and territorial authorities are required to "*Take into account any relevant planning document recognised by an iwi authority and lodged with council*" under sections 61(2A)(a), 66(2A)(a) and 74(2A) of the RMA (relevant to preparing or changing a regional policy statement, regional plan or a district plan).

The following is a list of those iwi and hapū who have developed environmental management plans (recognised by an iwi authority) and formally lodged them with council[4].

Ngātiwai Trust Board

Te Iwi o Ngātiwai Iwi Environmental Policy Documents 2007

Ngātiwai Aquaculture Plan 2005

Te Rūnanga o Ngāti Rehia

Ngati Rehia Environmental Management Plan 2007 (updated 2015 yet to be formally lodged with council)

Patuharakeke Te Iwi Trust Board

Hapū Environmental Management Plan 2015

Te Rūnanga o Ngāti Hine

Ngā Tikanga mo te Taiao o Ngāti Hine 2008

Kororareka Marae

Kororareka Marae Environmental Hapū Management Plan 2009

Te Uri o Hau Settlement Trust

Te Uri o Hau Kaitiakitanga O Te Taiao 2012

Ngāti Kuta

Whakatakoto Kaupapa Mo Te Hapū o Ngāti Kuta ki Te Rawhiti

Ngā Hapū o Te Wahapū o Te Hokianga Nui A Kupe

(Ngāti Korokoro, Ngāti Wharara, Te Poukā) Hapū Environmental Management Plan 2008

Te Rūnanga o Whaingaroa (Te U Kaipo RMU)

Kia Matau, kia mohia e ora ana Te U Kaipo 2011

Ngati Hau

Ngati Hau Environmental Management Plan 2016

Te Uriroroi, Te Parawhau and Te Māhurehure ki Whatitiri

Whatitiri Resource Management Plan 2016

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4 *An analysis of these iwi/hapū plans to determine the matters which need to be taken into account in plan changes is in the Issues and Options paper prepared for the regional for the review of the regional plan – http://www.nrc.govt.nz/contentassets/0d3e217aec2346549fdbd0b3e579c501/review-of-the-nrc-regional-plans---tangata-whenua-issues-and-options----final.pdf.*

3.1.5 The problem, opportunity and/or requirement

General issues

The purpose of these provisions is to provide guidance for resource consent processing with respect to tangata whenua values. Without guidance there is uncertainty as to the priority of specific tangata whenua values and hence the extent to which there is a need for analysis, and this can result in tangata whenua values being overlooked.

Identifying relevant resources/activities

The issues of significance to tangata whenua are in the Regional Policy Statement [5]. Those therefore represent issues of significance to tangata whenua, which have been supported by the community through the planning process.

A collation of these matters is needed for clarity when identifying the specific resources/activities requiring full analysis.

Best practice guidance

There is no currently accepted best practice for the type of analysis required.

Similar analysis to that required in the policy is often undertaken in documents such cultural impact assessments or cultural values assessments. There is no consensus on the appropriate terminology and hence none of the possible terminologies has been used. Nor is there an accepted best practice for the production of such a document.[6]

Guidance is therefore needed for the development of the analysis so that a consent officer has a defensible basis for a s88(3) decision. Rejecting an assessment of environmental effects containing an assessment which did not meet the process requirements specified in the policy would be enabled.

Guidance will assist councils when further information is requested pursuant to s92.

When a consent is being considered pursuant to s104, the guidance will facilitate evaluation of whether the appropriate tangata whenua values have been considered, and whether an appropriate process for analysis has been implemented.

Without the specific requirements of the policy for the analysis – tangata whenua endorsement, evidence based, identification of potential impacts and their management – investigations with a far less rigorous process are often all that is available.

Examples of current deficiencies are:

- In the absence of agreed processes, tangata whenua with valid concerns often fail to effectively express their concerns. In particular, while the basis of their issues may be articulated, relevant RMA management resolutions are often not identified.
- Tangata whenua decisions need to be collective and consensual. Without the process guidance, individuals with conflicts of interest or who are not endorsed by the relevant tangata whenua community may produce the sole analysis which is fundamentally flawed. In the absence of alternatives this may have influence. For instance, there have been applicants who are not themselves tangata whenua who have written their own version of a cultural analysis, without any engagement with the tangata whenua community.
- In the absence of guidelines and defined process, cases arise of conflicting tangata whenua analyses, without any criteria for evaluating between them.
- Without guidance from a process in the plan, decision makers lack criteria for evaluating any analysis.

Affected party status

Schedule 4 requires identification of affected parties and frequently there is uncertainty about identifying the appropriate tangata whenua parties.

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5 With the proviso regarding the appeal on genetic engineering provisions.

6 Quality Planning has guidance on the reception, but not the production, of cultural assessments.

3.1.6 Management options

In this section "analysis" refers to the analysis required in an assessment of environmental effects and is consistent with the usage in the Regional Policy Statement.

This section summarises the management options for the effects of activities on tangata whenua and their taonga. The intention is not to identify every different combination of approach as there would be many, but to represent the range of options and highlight key differences in approaches.

The options focus on three key aspects:

- Guidance on *how* to assess effects on tangata whenua values;
- Identifying the particular tangata whenua *values* for which an assessment of effects is required, and processes to follow when not required; and
- Identifying the *activities* which effects on tangata values are to be considered.

These factors are considered in describing the options below.

Option 1: do nothing/status quo

This option reflects the status quo, for which there is no guidance or requirements in the regional plans.

Guidance on how to assess effects on tangata whenua values	Identifying when an assessment of effects is required	Activities which effects on tangata whenua values to be considered
None in plan.	None (case-by-case).	Discretionary activities only.

For each application it would be necessary to determine the extent to which a full analysis is needed, and to develop a process for an analysis where one is required. While the RMA and the Regional Policy Statement give some general guidance, consent officers would have no specific guidance in the plan for evaluating the quality of this aspect of the assessment of environmental effects for a s88(3) decision, or for making a s92 request. Decision-makers would have no specific direction for s104 determinations.

Option 2: guidance provided (preferred option)

Focus is provided to identify the resources/activities for which a full analysis is required. A process for the analysis provided and is required to be implemented.

Guidance on how to assess effects on tangata whenua values	Identifying when an assessment of effects is required	Activities which effects on tangata whenua values to be considered
Included in plan.	Assessment required for significant tangata whenua values. Case-by-case for all others.	All discretionary activities, and all restricted discretionary and controlled activities that that have been determined to be relevant.

For controlled and restricted discretionary activities, consideration of impacts on tangata whenua values may be constrained if it is not enabled by the conditions or matters of control or discretion. In some cases there is the potential for more than minor adverse effects on those values as a result of the activities. For such controlled and restricted discretionary activities, the requirement to consider the effects on tangata whenua and their taonga has been included. Relevant rules have been identified needing this inclusion because the activities potentially impact values determined by issues of significance to tangata whenua, are needed to give effect to national policy statements, or to take into account iwi planning documents. This inclusion only applies to a small number of rules.

For instance giving effect to the Policy D1, National Policy Statement for Freshwater Management, requires councils "*to take reasonable steps … to reflect tangata whenua values*" for freshwater management. This has been a factor in the inclusion of the tangata whenua provision in some freshwater rules. Other factors are derived from components of the preferred policy – issues of significance to tangata whenua, national policy statements, the Regional Policy Statement and iwi planning documents.

Option 3: require analysis for all consent applications

Guidance on how to assess effects on tangata whenua values	Identifying when an assessment of effects is required	Activities which effects on tangata whenua values to be considered
Included in plan.	All activities requiring resource consent.	All activities requiring resource consent.

This option would see all resource consent applications having to include an assessment of effects on tangata whenua and their taonga.

Option 4: comprehensive mapping of tangata whenua values and resources to be considered

A possible option would be to comprehensively map all potential resources or locations for which there are potential more than minor adverse effects on tangata whenua values (in addition to identifying places of significance to tangata whenua). Any such process is imperfect, and policy provisions would still be needed for management of its omissions.

3.1.7 Screening the management options

Option 4 is comprehensive mapping of tangata whenua values and resources to be considered. The cost of such an exercise would be excessive and therefore this option has been excluded.

3.1.8 High level objectives and measures

Section 32 requires an assessment of "*…the efficiency and effectiveness of the provisions in achieving the objectives…*". Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section 1.6 'Evaluation approach' for more details.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. They also signal a direction for where we want to head, without stating how far we go – that comes later (they are the beginnings of objectives).

Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against

High level objective	Measure
Minimise adverse effects on tangata whenua and their taonga.	Likelihood that adverse effects on tangata whenua and their taonga will appropriately be considered as part of decision making on resource consent applications, and that the scale of the analysis is commensurate with the potential impacts. 1 = in some cases 2 = in many cases 3 = in most or all cases

High level objective	Measure
Maximise certainty of when and how adverse effects on tangata whenua and their taonga are assessed.	Constructed scale of the level of certainty about what is required of a resource consent applicant where there are likely to be adverse effects on tangata whenua and their taonga: 1 = no certainty 2 = certainty in some cases 3 = certainty in many or most cases
Minimise costs to resource users.	The cost of the analysis (excluding mitigation costs) is appropriate for the scale of activity. Cost is: 1 = low 2 = at or near optimum cost 3 = unpredictable 4 = significantly above optimum cost

Explanation for the high level objectives and measures

Minimise adverse effects on tangata whenua and their taonga

Method 8.1.5 of the Regional Policy Statement, which requires the analysis in consent processing, arose from tangata whenua concern in the region over lack of effective input into decision making and the consequent negative impact on tangata whenua values. Change in this situation is the key output captured by this high level objective.

Without focus and guidance, while there is a statutory requirement to consider impacts on tangata whenua values, in practice in many cases they are inadequately addressed or overlooked. The status quo relies on the experience of individual consent officers and their ability to respond, and on the capacity of tangata whenua to engage effectively. Distribution of consents to relevant tangata whenua groups [7] helps to create opportunities for engagement. But the current state of engagement is still low. Hence management responses to protect tangata whenua values are often limited or absent.

Capacity to investigate and address these matters has been variable for both council and iwi/hapū entities. Current and future Treaty settlement legislation is enabling greater capacity for tangata whenua engagement. Iwi with financial and other resources from settlement are beginning to take a greater role in environmental management. Also, increasing numbers of tangata whenua are graduating from wānanga and other environmental management courses.

While increased guidance and defined process will not of themselves increase protection, the combination of plan provisions and the increased capacity will enable much more effective engagement and consequent protection over the life of the plan.

A requirement for a full analysis for all consents would in principle increase protection, it would result in unjustifiable time and expense. This could in practice detract from the effort needed for addressing priority issues.

Maximise certainty of when and how adverse effects on tangata whenua and their taonga are assessed

Applicants need certainty of process and reliable forecasts of costs. Tangata whenua need certainty that there will be adequate management of impacts on their values. Council needs certainty on how to assess and make decisions on consent applications.

7 *It is council's practice to circulate all consent applications to tangata whenua.*

Without appropriate analysis the identification of potential impacts is unlikely to be achieved. However, without focus and best practice guidance, analysis may be of little worth in identification and management of options. Further, that analysis needs to be able to be given full consideration in the consenting process.

Capacity to investigate and address these matters has been variable for both council and iwi/hapū entities. Current and future Treaty settlement legislation is enabling greater capacity for tangata whenua engagement. Iwi with financial and other resources from settlement are beginning to take a greater role in environmental management. Also, increasing numbers of tangata whenua are graduating from wānanga and other environmental management courses.

Minimise costs to resource users

The cost for any analysis will be first determined by the scale and complexity of the activity and its impacts. For instance damming freshwater could have a limited range of readily identified effects and any cultural impacts could be quickly identified. This may not require more than a meeting between the applicant and a tangata whenua entity followed by documentation. An application for a marina may have adverse effects on access, kaimoana, onshore activities etc and may need more analysis and response. An activity such as offshore sand mining or wave electricity generation would have less easily recognised effects and need more extensive analysis to determine the cultural impacts. The costs for these analyses could range from hundreds to tens of thousands of dollars, depending on the scale and complexity.

Schedule 4 of the RMA requires an analysis is always undertaken. It is not possible, given the range of potential different activities, to itemise each type of activity and consent, and then to predict potential analysis costs. What is important is that the costs are kept to an appropriate level for the type of activity and the scale of potential impacts and the relevant analysis. By specifying the activities and values to be considered, and the analysis process, standardised services and their costs will be established. Without this guidance each application could require developing a method as well as implementing it. Time would then need to be spent for each consent to evaluate the validity of the method. Without the focus on specific activities and values, or a requirement for a full assessment with all consent applications, a lot of unnecessary work would result.

From an applicant/developer perspective the status quo will often be preferable. As many effects will often not be identified, the costs of analysis and implementation of management responses will be avoided. However, this is at a cost of higher adverse effects on tangata whenua values. Also, although at this stage will limit tangata whenua engagement and scrutiny costs may be low, once iwi capacity builds a different situation could exist. Demands for more comprehensive analysis are likely to grow during the life of the plan. If there are no guidelines for activities and values to be addressed, and no defined process for the analysis, costs would be unpredictable and could be large.

If an identification process is not implemented and a place of significance to tangata whenua is subsequently impacted during development, the costs of managing the impacts, including unforeseen mitigation costs, could be considerably greater than those of an identification and appropriate management.

Where simple type analysis is required the expertise to undertake this analysis can be found in some tangata whenua organisations. Where more complex analysis, and in particular the articulation of the findings in terms appropriate for RMA implementation, is required it is very likely that expertise will be required to be contracted in. In time this will create a competitive market which will set appropriate costs.

3.1.9 Evaluating the management options

High level objective and measure	Option 1: status quo with no guidance	Option 2: guidance in plan	Option 3: all consents have full analysis
Minimise adverse effects on tangata whenua and their taonga. *Measure:*	2 = in some cases	3 = in most or all cases	3 = in most or all cases

High level objective and measure	Option 1: status quo with no guidance	Option 2: guidance in plan	Option 3: all consents have full analysis
Likelihood that adverse effects on tangata whenua and their taonga will appropriately be considered as part of decision making on resource consent applications, and that the scale of the analysis is commensurate with the potential impacts. 1 = in some cases. 2 = in many cases. 3 = in most or all cases.			
Maximise certainty of when and how adverse effects on tangata whenua and their taonga are assessed. *Measure:* Constructed scale of the level of certainty about what is required of a resource consent applicant where there are likely to be adverse effects on tangata whenua and their taonga: 1 = no certainty. 2 = certainty in some cases. 3 = certainty in many or most cases.	1 = no certainty	2 = certainty in some cases	3 = certainty in many or most cases
Minimise costs to resource users. *Measure:* The cost of the analysis (excluding mitigation costs) is appropriate for the scale of activity. Cost is: 1 = significantly above optimum cost. 2 = unpredictable. 3 = at or near optimum cost. 4 = low.	1 = significantly above optimum cost.	3 = at or near optimum cost	1 = significantly above optimum cost

Certainty about the evaluation

There is inherent uncertainty with the evaluation. All the measures are a judgement call based on knowledge and experience by the author.

Time-frame for the evaluation

The time-frame is over the life of the plan (10-15 years).

The preferred management option

Option 2 is the preferred option. It provides protection for tangata whenua with a high degree of certainty for applicants. While Option 3 would have an equally high or potentially higher degree of protection it has an unacceptably higher cost. Option 1 is the least preferred as it has little guarantee of protection, is uncertain, and has unpredictable costs.

3.2 Places of significance to tangata whenua

3.2.1 Executive summary

Note: In what follows "places of significance" means "places of significance to tangata whenua".

This section considers options for the identification, assessment and protection for places of significance to tangata whenua (which includes landscapes, areas and sites of significance) in the coastal marine area and freshwater bodies. District councils are responsible for managing places of significance to tangata whenua on land [8].

Without identification and recording of relevant values, the locations of those values and how they may be impacted, many places of significance are unknown to the general public and are vulnerable to the impacts of development.

Places of significance will often be captured by the definition of historic heritage. However, places of significance may also be determined in terms of RMA s6(e) and s6(f) implementation. It is therefore possible that some places of significance may not be able to be identified by using processes in the Regional Policy Statement for historic heritage.

Places of significance are often only expressed in terms of oral tradition and unlike most historic heritage, lack written records. Relevant tangata whenua communities hold that oral knowledge, and hold mana over the places of significance. The appropriate engagement of those communities is an essential component of the identification and assessment process.

Other resources, such as outstanding natural character areas, have high level protection in the Regional Policy Statement or the plan. Places of significance require no lower a standard of protection.

The preferred management option is Option 2: *A definition, an assessment process and a policy for protection.* This option includes:

- Descriptions of attributes of places of significance with details of how those attributes can be analysed to be included in the regional plan.
- A high level of protection for places of significance.

The preferred option:

- Gives effect to the Regional Policy Statement;
- Takes into account iwi planning documents;
- Gives effect to national policy statements;
- Recognises other relevant legislation;
- Identifies roles specifically for tangata whenua in determining and recording places of significance;
- Has a robust and defensible process for identification and assessment of places of significance;
- Provides appropriate protection for places of significance; and
- Aims to minimise costs of implementation.

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8 *s31 Resource Management Act 1991*

3.2.2 Relevant provisions

The relevant provisions for this evaluation are:

- Policy D.1.5 - Managing effects on Places of Significance to Tangata Whenua
- Policy D.1.6 - Places of Significance to Tangata Whenua
- Rule C.1.1.3 - Temporary structure - permitted activity
- Rule C.1.1.4 - Aids to navigation - permitted activity
- Rule C.1.1.12 - Structures for scientific, research, monitoring or education purposes - controlled activity
- Rule C.1.1.17 - Structures outside a significant marine area - discretionary activity
- Rule C.1.1.18 - New hard protection structures and extension or addition to existing hard protection structures – discretionary activity
- Rule C.3.1.2 - Extraction of material from rivers – permitted activity
- Rule C.3.1.9 - New minor structures – permitted activity
- Rule C.3.1.10 - Minor river bank protection works – permitted activity
- Rule C.3.1.11 - Existing vessel launching, retrieval and mooring structures – controlled activity
- Rule C.3.1.13 - Structures – discretionary activity
- Rule C.3.1.16 - Structures in a significant area – non-complying activity
- Rule C.3.1.18 - New flood defence in significant areas – non-complying activity

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3.2.3 Legal background

Note: In what follows "places of significance" means "places of significance to tangata whenua".

Resource Management Act – Part 2

Section 6(e) in Part 2 of the RMA requires that "*the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga*" be recognised and provided for as a matter of national importance. Section 6(f), historic heritage, and section 6(g), protected customary rights, must similarly be recognised and provided for.

Kaitiakitanga must be given particular regard to under section 7(a).

Section 8 requires that the principles of the Treaty of Waitangi (Te Tiriti o Waitangi) be taken into account. These principles have not been defined in legislation, although the Courts and the Waitangi Tribunal have endeavored to extrapolate the practical implications of the "principles" in relation to the factual circumstances of the particular proceedings and claims before them. RMA case law has clarified that Section 8 recognises the relationship of tangata whenua with natural and physical resources and encourages active participation of, and consultation with, tangata whenua in resource management decision-making.

Legal definition of the requirement to "recognise and provide for" in section 6 means that councils must make provision for the relationship of Māori with their ancestral lands, water, sites, waahi tapu, and other taonga, and anticipates a positive action by decision-makers. The requirement to "have particular regard to kaitiakitanga" in section 7 means that this matter must be given genuine attention, consideration and appropriate weight. The requirement to "take(n) into account" in Section 8 means that it must be considered and weighed up along with all the other relevant factors.

These definitions taken from recent case law do not override the primary purpose of the RMA (section 5).

Sites and landscapes

The Section 2 RMA definition of historic heritage applies to individual sites as well as collections of sites in an "area" or its "surroundings". This definition has broad application, and is likely to capture most if not all tangata whenua sites and landscapes of significance.

A tangata whenua site or landscape of significance in terms of the RMA may also arise from Section 6(e) – "*the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, wāhi tapu, and other taonga"; or from Section 6(g) – "the protection of protected customary rights*".

These sites and landscapes of significance to tangata whenua will be referred to here collectively as "places", this is consistent with the definition in the proposed provisions.

Since RMA historic heritage is central to identification and management of many significant places, a discussion of its RMA implementation follows.

Heritage management

Heritage management and the RMA

Historic heritage is a matter of national importance in the RMA (Section 6(f)). Historic heritage is defined in Section 2 as:

> *historic heritage –*
>
> *(a) means those natural and physical resources that contribute to an understanding and appreciation of New Zealand's history and cultures, deriving from any of the following qualities:*
>
> *(i) archaeological:*
>
> *(ii) architectural:*
>
> *(iii) cultural:*
>
> *(iv) historic:*
>
> *(v) scientific:*
>
> *(vi) technological; and*
>
> *(b) Includes –*
>
> *(i) historic sites, structures, places, and areas; and*
>
> *(ii) archaeological sites; and*
>
> *(iii) sites of significance to Māori, including wāhi tapu; and*
>
> *(iv) surroundings associated with the natural and physical resources.*

The practice of archaeology was concentrated on collection of *artefacts* up to the 1950s. In the 1960s archaeological *sites* became the dominant study context.

The Historic Places Act 1993 reflected that 1960s methodology. Current academic work considers archaeological *landscapes* as a critical subject for investigation. The RMA definition of historic heritage reflects in b(i) and b(iv) a landscape approach – that is, historic areas and the associated surroundings.

At the NZ Institute of Landscape Architects Conference in 2005, Judge Shonagh Kenderdine presented a comprehensive paper on the legal context of heritage landscapes.[9] She notes that:

- The RMA s2 definition of historic heritage is extremely broad despite the Parliamentary debate that preceded it. "*At first I considered that by not using the term 'cultural landscape' in the RMA, New Zealand was seeking to exclude some of our richest historical records based on Māori traditions.*" But the development of the Bannockburn study[10] "*avoids some of the pitfalls the legislation may have foreseen*" … "*The reason for DoC's use of heritage is that the term is broader and the*

9 *Heritage landscapes: developing legislative frameworks which allow for protection and change*

10 *See Janet Stevenson, Heather Bauchop, Peter Petchey, Science for Conservation, Department of Conservation.*

use of cultural has generally been restricted to current relationships with the landscape. Former relationships are defined as historic. This choice is consistent with the definition of 'cultural heritage' as defined by the ICOMS NZ Charter".

- *"Taken in conjunction with the existing s6(e) relating to the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, wāhi tapu, and other taonga ... the possible ramifications of s6(f) may be widespread in cultural forms."*

The Bannockburn study J[11] *"made the point that the concept of landscape is not only that of the physical environment but also the cultural perceptions, practices, stories, traditions and the relationships between people and the land".*

Regional planning for heritage management must therefore encompass potential impacts on a range of heritage resources including sites and landscapes.

David Derby[12] states more than Section 6 of the RMA is relevant to heritage management. For instance, "*heritage is embodied in the RMA under s7(c) and other sections of the RMA"including s8, s66, s93, and ss187-198".*

Māori heritage

The following is from the Quality Planning website:

> *Recognition and protection of Māori heritage is a fundamental principle of historic heritage in New Zealand. The ICOMOS New Zealand Charter for the Conservation of Places of Cultural Heritage Value (www.icomos.org/charters/ICOMOS_NZ_Charter_2010_FINAL_11_Oct_2010.Pdf) states:*
>
> > *The indigenous cultural heritage of tangata whenua relates to whanau, hapū, and iwi groups. It shapes identity and enhances well-being, and it has particular cultural meanings and values for the present, and associations with those who have gone before. Indigenous cultural heritage brings with it responsibilities of guardianship and the practical application and passing on of associated knowledge, traditional skills, and practices.*
> >
> > *The Treaty of Waitangi is the founding document of our nation. Article 2 of the Treaty recognises and guarantees the protection of tino rangatiratanga, and so empowers kaitiakitanga as customary trusteeship to be exercised by tangata whenua. This customary trusteeship is exercised over their taonga, such as sacred and traditional places, built heritage, traditional practices, and other cultural heritage resources. This obligation extends beyond current legal ownership wherever such cultural heritage exists.*
>
> *Heritage has long been associated with historic buildings associated with early European settlement. This association is expressed in the many lists and schedules of heritage places in which historic buildings are dominant. Historic heritage needs to go beyond these types of buildings and seek to include and protect Māori heritage. This means that councils should consider including Māori heritage in identification and protection processes.*
>
> *Māori heritage covers the full range of values and types of places – buildings, sites and areas. For example, Māori heritage may include urupā, water springs, pa, gardens, battle grounds, marae, flag poles and pou, wetlands, churches, hunting sites, rivers and mountains.*
>
> *To build trust and establish certainty, processes to identify and protect historic heritage should be preceded by discussion and agreement between councils and tangata whenua. This will be added by participation agreements such as memorandums of understanding, contracts and forums. Participation agreements should clearly outline the process of identifying and protecting historic heritage as it applies to Māori and the expectations of the parties involved.[13]*
>
> *The identification of Māori heritage under Māori ownership requires a carefully planned management strategy. There are different types of Māori land, of which often has complex ownership arrangements and potentially a large number of owners. Māori land is defined in the Te Ture Whenua Maori Act 1993 (www.legislation.govt.nz/act/public/1993/0004/latest/DLM289897.Html). Engagement will often be required with the Trustees and lessees, public notification in major and local newspapers and consultative hui.*

11 *Stephenson, H Bauchop, and P Petchey, 2004. Bannockburn Heritage Landscape Study, SCIENCE FOR CONSERVATION 244. The Bannockburn study trialled a newly-developed methodology for investigating heritage at a landscape scale. A secondary purpose was to produce a heritage landscape report on the Bannockburn area of Central Otago*

12 *Sustainable Management of Our Heritage ,1997. David Derby, Planning Quarterly.*

13 *The processes for identification through working with TTMAC are the initial stage of engagement.*

Iwi Management Plans are often a key method to identify Māori heritage.

Assigning values or significance to Māori heritage resources is a task for the relevant tangata whenua.

"... a distinction should be drawn between historic places and wāhi tapu as they represent different cultural concepts. Furthermore, ... it is inappropriate to rank places of Māori interest in terms of significance except where hapū and iwi asked that this should be done."[14]

Tangata whenua may require information on sites to not be made public. This sensitive information can be held in a silent file which is not publicly available, but can trigger a consent requirement.

Statutory acknowledgements

Statutory acknowledgements are statements in Treaty of Waitangi settlements between Crown and tangata whenua (generally iwi) that are intended to recognise the mana of tangata whenua groups in relation to identified sites and areas.

Statutory acknowledgements are an acknowledgement by the Crown of the particular cultural, spiritual, historic, and traditional association of an iwi with each statutory site and area.

Text for statutory acknowledgements is included in the schedules to each relevant Claims Settlement Act. The locations for statutory acknowledgement areas are shown on Survey Office (SO) plans. While these plans do not indicate the precise boundaries of the statutory acknowledgement area, they do indicate the location as nearly as possible.

Statutory acknowledgements are only over Crown land and may apply to land, rivers, lakes, wetlands, a landscape feature, or a particular part of the coastal marine area. Where a statutory acknowledgement relates to a river, lake, wetland or coastal area, it only applies to that part of the bed in Crown ownership or control.

In terms of RMA processes, the main implication for statutory acknowledgements is for resource consent applications. While the only legal requirements with regard to statutory acknowledgements in the preparation of plans is to attach them to the plan, they provide a clear statement of the interests of tangata whenua that can be used to inform plan preparation.

For example, statutory acknowledgements can be used to:

- Create a starting point for consultation.
- Assist in drafting plan provisions.
- Identify activities/circumstances in which the iwi authority may consider waiving its right to receive summaries of applications; for example, where particular activities are not considered to affect the associations identified in the statutory acknowledgement.
- Using controlled, restricted discretionary and discretionary activity status where activities are likely to result in adverse effects on particular sites or issues of concern identified in the statutory acknowledgement, which can include the requirement to obtain written approval from the claimant group.
- Identify areas of importance to an iwi, or where consultation with iwi is to be encouraged through their incorporation into planning maps, or alert layers within GIS.

Statutory Acknowledgements in Northland

Treaty of Waitangi settlement legislation has been enacted for several iwi and hapū within the Northland region:

- Te Uri o Hau
- Te Roroa
- Ngati Manuhiri
- Ngati Kuri
- Te Aupouri
- Ngai Takoto
- Te Rarawa

14 *Protecting Historic Places in NZ , 1998. Harry Allen, University of Auckland.*

Details about the statutory acknowledgements can be found in the respective settlement legislation for each iwi or hapū.

Rather than attaching statutory acknowledgements to every plan and regional policy statement, the approach taken by the regional council is to have a single companion document recording all statutory acknowledgement areas – "Te Ture Whakamana nga Iwi o Taitokerau"[15].

Marine and Coastal Area Takutai Moana Act 2011

Protected customary rights are identified and provided legal status by this statute although some applications have been lodged.

In section 6(g) protected customary rights are a matter of national significance and must be recognised and provided for. The enactment of the statute and the amendment to include section 6(g) occurred after the regional plans became operative.

At this time there have been no protected customary rights orders granted in Northland.

3.2.4 Planning documents

New Zealand Coastal Policy Statement

Objective 3 of the New Zealand Coastal Policy Statement 2010 requires that we "take account of the principles of the Treaty of Waitangi, recognise the role of tangata whenua as kaitiaki and provide for tangata whenua involvement in management of the coastal environment" through the following:

- Recognising the ongoing and enduring relationship of tangata whenua over their lands, rohe and resources;
- Promoting meaningful relationships and interactions between tangata whenua and persons exercising functions and powers under the Act;
- Incorporating mātauranga Māori into sustainable management practices; and
- Recognising and protecting characteristics of the coastal environment that are of special value to tangata whenua.

Policy 2 provides councils with direction for the implementation of Objective 3:

> *Policy 2 The Treaty of Waitangi, tangata whenua and Māori heritage*
>
> *In taking account of the principles of the Treaty of Waitangi (Te Tiriti o Waitangi), and kaitiakitanga, in relation to the coastal environment:*
>
> *(a) recognise that tangata whenua have traditional and continuing cultural relationships with areas of the coastal environment, including places where they have lived and fished for generations;*
>
> *...*
>
> *(f) provide for opportunities for tangata whenua to exercise kaitiakitanga over waters, forests, lands, and fisheries in the coastal environment through such measures as:*
>
> > *(i) bringing cultural understanding to monitoring of natural resources;*
> >
> > *(ii) providing appropriate methods for the management, maintenance and protection of the taonga of tangata whenua;*
> >
> > *...*
>
> *(g) in consultation and collaboration with tangata whenua, working as far as practicable in accordance with tikanga Māori, and recognising that tangata whenua have the right to choose not to identify places or values of historic, cultural or spiritual significance or special value:*

15 www.nrc.govt.nz/resources/?url=%2FResource-Library-Summary%2FPlans-and-Policies%2FStatutory-Acknowledgements%2FStatutory-Acknowledgements-in-Northland%2F

(i) recognise the importance of Māori cultural and heritage values through such methods as historic heritage, landscape and cultural impact assessments; and

(ii) provide for the identification, assessment, protection and management of areas or sites of significance or special value to Māori, including by historic analysis and archaeological survey and the development of methods such as alert layers and predictive methodologies for identifying areas of high potential for undiscovered Māori heritage, for example coastal pā or fishing villages

National Policy Statement for Freshwater Management

The National Policy Statement for Freshwater Management identifies national values, some of which are compulsory. Councils may identify and manage non-compulsory values.

Policy CA2

By every regional council applying the following processes in developing freshwater objectives for all freshwater management units:

a) considering all national values and how they apply to local and regional circumstances;

b) identifying the values for each freshwater management unit, which

i. must include the compulsory values; and

ii. may include any other national values or other values that the regional council considers appropriate (in either case having regard to local and regional circumstances);.

Those non compulsory values include:

***Wai tapu** – Wai tapu represent the places where rituals and ceremonies are performed.*

Rituals and ceremonies include, but are not limited to, tohi (baptism), karakia (prayer), waerea (protective incantation), whakatapu (placing of raahui), whakanoa (removal of raahui), and tuku iho (gifting of knowledge and resources for future generations).

In providing for this value, the wai tapu would be free from human and animal waste, contaminants and excess sediment, with valued features and unique properties of the wai protected to some extent. Other matters that may be important are that identified catchments have integrity (there is no artificial mixing of the wai tapu) and identified taonga in the wai are protected.

***Transport and tauranga waka** – The freshwater management unit is navigable for identified means of transport.*

Transport and tauranga waka generally refers to places to launch waka and water craft, and appropriate places for waka to land (tauranga waka).

Water quality and quantity in the freshwater management unit would provide for navigation. The freshwater management unit may also connect places and people including for traditional trails and rites of passage, and allow the use of various craft.

Regional Policy Statement

Policy 4.5.3 of the RPS identifies heritage criteria. These are:

- *"Archaeological and / or scientific importance: the resource contributes significantly to our understanding of human history or archaeological research;*
- *Architecture and technology: the structure or building is significant due to design, form, scale, materials, style, period, craftsmanship, construction technique or other unique element / characteristic;*
- *Rarity: the resource or site is unique, uncommon or rare at a district, regional or national level;*
- *Representativeness: the resource is an excellent example of its class in terms of design, type, use, technology, time period or other characteristic;*

- *Integrity: the resource retains a high proportion of its original characteristics and integrity compared with other examples in the district or region;*
- *Context: the resource forms part of an association of heritage sites or buildings which, when considered as a whole, become important at a district, regional or national scale;*
- *People and events: the resource is directly associated with the life or works of a well-known or important individual, group or organisation and / or is associated with locally, regionally or nationally significant historic events;*
- *Identity: the resource provides a sense of place, community identity or cultural or historical continuity;*
- *Tangata whenua: the resource place or feature is important to tangata whenua for traditional, spiritual, cultural or historic reasons; and*
- *Statutory: the resource or feature is recognised nationally or internationally, including: a World Heritage Site under the World Heritage Convention 1972; is registered under the Historic Places Act 1993; or is recognised as having significant heritage value under a statutory acknowledgement or other legislation."*

4.6.2 Policy – Maintaining the integrity of heritage resources

> *(1) Protect the integrity of historic heritage resources ...by ... avoiding, remedying or mitigating other adverse effects (including cumulative adverse effects) on historic heritage*

4.4.1 Policy – Maintaining and protecting significant ecological areasand habitats has equivalent wording to this policy ("*avoid, remedy or mitigate adverse effects of subdivision, use and development so they are no more than minor"*). Also included in 4.4.1 is the requirement that effects are no more than minor on "*(b) Areas of indigenous vegetation and habitats of indigenous fauna, that are significant using the assessment criteria in Appendix 5".* It does not require that the areas are mapped and included in a plan, but that they have been assessed using the agreed process.

4.6.1 Policy – Managing effects on the characteristics and qualities natural character, natural features and landscapes

> *"...Avoid adverse effects of subdivision use, and development on the characteristics and qualities which make up the outstanding values of areas of outstanding natural character, outstanding natural features and outstanding natural landscapes."*

The Regional Policy Statement assigns identification and management of heritage sites in the coastal marine area and freshwater to the regional council, and on dry land to district councils[16].

Iwi planning documents

Most iwi planning documents lodged with the council identify heritage and related issues as having importance.

An iwi/hapū management plan is any planning document recognised by an Iwi Authority (the authority that represents an iwi and that is recognised by that iwi as having authority to do so).

Iwi/hapū management plans may be formal planning documents similar to council policy documents, or they may be a statement of iwi policies in a less formal and detailed memo or report. Plans maybe be developed by iwi, hapū or whānau and provide a statement on the position of the tangata whenua on a range of issues so that these can be heard and considered by councils and other stakeholders.

In some instances, iwi management plans may be written in a holistic manner and may go more broadly than RMA requirements and include social, economic and health issues. They could also be a statement on the iwi interests in relation to one resource such as fresh water or a particular site.

Iwi/ hapū environmental management plans provide a vision of how the management and protection of natural and physical resource can be achieved based on cultural and spiritual values of tangata whenua.

There are a range of sections within the Resource Management Act (RMA) that provide for Māori interests. In relation to iwi management plans, regional councils and territorial authorities are required to "*Take into account any relevant planning document recognised by an iwi authority and lodged with council*" under sections 61(2A)(a), 66(2A)(a) and 74(2A) of the RMA (relevant to preparing or changing a Regional Policy Statement, Regional Plan or a District Plan).

16 *Method 4.6.3.*

The following is a list of those iwi and hapū who have developed environmental management plans (recognised by an iwi authority) and formally lodged them with council[17].

Ngātiwai Trust Board

Te Iwi o Ngātiwai Iwi Environmental Policy Documents 2007

Ngātiwai Aquaculture Plan 2005

Te Rūnanga o Ngāti Rehia

Ngati Rehia Environmental Management Plan 2007 (updated 2015 yet to be formally lodged with council)

Patuharakeke Te Iwi Trust Board

Hapū Environmental Management Plan 2015

Te Rūnanga o Ngāti Hine

Ngā Tikanga mo te Taiao o Ngāti Hine 2008

Kororareka Marae

Kororareka Marae Environmental Hapū Management Plan 2009

Te Uri o Hau S ettlement Trust

Te Uri o Hau Kaitiakitanga O Te Taiao 2012

Ngāti Kuta

Whakatakoto Kaupapa Mo Te Hapū o Ngāti Kuta ki Te Rawhiti

Ngā Hapū o Te Wahapū o Te Hokianga Nui A Kupe

(Ngāti Korokoro, Ngāti Wharara, Te Poukā) Hapū Environmental Management Plan 2008

Te Rūnanga o Whaingaroa (Te U Kaipo RMU)

Kia Matau, kia mohia e ora ana Te U Kaipo 2011

Ngati Hau

Ngati Hau Environmental Management Plan 2016

Te Uriroroi, Te Parawhau and Te Māhurehure ki Whatitiri

Whatitiri Resource Management Plan 2016

3.2.5 The problem, opportunity and/or requirement

Protection of places of significance is a requirement derived from the RMA. Without identification these places of significance are frequently unknown to the general public. Often it is a proposal for an activity that triggers the need for protection. If the proposed activity is permitted or controlled, it may commence without restraints with significant impacts on the place of significance.

17 *An analysis of these iwi/hapū plans to determine the matters which need to be taken into account in plan changes is in the Issues and Options paper prepared for Northland Regional Council for the review of the regional plan.*

While there is a lot of commonality between historic heritage sites and landscapes and places of significance, there are important distinctions.

The process for identification and assessment of places of significance needs to engage tangata whenua, but also needs to have the consensual support of relevant tangata whenua.

Historic heritage landscapes

A Historic Places Trust convened Think Tank on heritage landscapes in April 2003 reported: *"The concept of heritage landscapes is an inclusive one – it encompasses iwi views of heritage significance while at the same time capturing historical relationships to land developed by European and other cultural groups."*[18]

The Think Tank consensus on the concept of heritage landscapes:

- *"They are those landscapes, or networks of sites, which deserve special recognition or protection because of their heritage significance to communities, tangata whenua, or the nation. They encompass the physical structures and changes made to the environment by people, natural landforms modified by human action, the meanings given to places and the stories told about them."*

"The concept includes:

- *Land, rivers, lakes and sea. They include both physical features and stories.*
- *The term stories ... as a collective term for history, meaning, myth and stories in written, oral and other forms.*
- *Heritage landscapes differ from historic sites or buildings in that:*
- *They can cover large areas.*
  - *They can have many owners.*
  - *There may be many parties with an interest in the landscape.*
  - *They can have natural and cultural values.*
  - *Unlike sites, which are usually associated with a particular group or story, historic landscapes can represent the heritage of many.*
  - *Historic sites or buildings can usually be considered artefacts. In comparison, heritage landscapes are dynamic systems, undergoing constant change.*
  - *Heritage landscapes don't fit neatly into a single historic period, but are a composite of layers of human history and human interaction.*
  - *Their significance can include ongoing traditions associated with that space.*
- *"Compared to heritage sites or buildings, heritage landscapes are therefore potentially more difficult to identify, understand, evaluate and protect."*
- *Increasingly, one person may be made up of many cultural strands. An individual may descend from many different tribes, or may be from both Māori and Pakeha backgrounds, or may be multicultural. These multiple identities make it all the more important to be able to tell the many stories that may be associated with one landscape."*

Planning to provide for heritage landscapes requires new understandings and new methods. The change in perspective is a paradigm shift which needs a significant change in provision. The enactment of s6(f) makes that a requirement, rather than an option. The work on identification of heritage sites, both for regional and district councils, needs to encompass these concepts of heritage landscapes.

Identifying places

Post European contact heritage resources in almost all cases have written records which can trigger their identification. Places of significance to tangata whenua, in most cases, are recorded only in oral tradition, and that information is held by the relevant tangata whenua community. Without engagement and appropriate involvement of that community, identification is highly unlikely or inappropriate.

18 *Heritage Landscapes Think Tank – Report on Proceedings, Historic Places Trust, 2003.*

There are often sensitivities about revealing details, including exact location, of places of significance. This does not apply to general historic heritage resources, and therefore there are different needs for silent files or similar methods for places of significance.

Historic heritage/places

While heritage status arises from s6(f), as can that for some places of significance, the status for places of significance can also arise from s6(e). Places of significance may therefore fail to be identified using only s6(f) implementation. Further, processes for identification and assigning significance to historic heritage do not include the need for tangata whenua consensus. For places of significance, this is an essential component of the process.

The process

The process for identification and assessment of places of significance needs to be robust – for instance be evidence based and identify values and locations – but it must also effectively engage the relevant tangata whenua community. It is that community which holds the knowledge of their own taonga, and they hold the mana of those places of significance.

3.2.6 Management options

This section summarises the management options for places of significance. The intention is not to identify every different combination of approach as there would be many, but to represent the range of options and highlight key differences in approaches.

Places of significance = Places of significance to tangata whenua.

The key differences between the options are:

- The amount of guidance given for describing and identifying places of significance.
- Whether places of significance are (or can) be mapped in the Regional Plan.
- The level of protection for places of significance provided.

Option 1: Do nothing

This option assumes that the significance will only be identified through identifying historic heritage. It therefore assumes no specific processes for tangata whenua engagement and endorsement are needed.

Opportunity to be mapped in plan?	Guidance for describing and identifying places of significance	Protection provided
Only those that are "historic heritage"	None	Nothing in rules and policies specific to tangata whenua and places.

There are provisions for identification of historic heritage resources. The application of processes for identification and assessment would, for this option, be assumed to be sufficient to identify Places of Significance to Tangata Whenua.

Option 2: A definition, an assessment process and a policy for protection

This option includes descriptions of attributes of Places of Significance with details of how those attributes can be analysed. A high level of protection is provided.

Opportunity to be mapped in plan?	Guidance for describing and identifying places of significance	Protection provided
Yes	Robust process and defined values/locations included in Regional Plan.	Policy = avoid more than minor effects on identified places of significance (mapped in plan or not).

Opportunity to be mapped in plan?	Guidance for describing and identifying places of significance	Protection provided
		Consent generally required for activities that are likely to have adverse effects on place of significance.

The relevant tangata whenua will be engaged in the process of identification and assigning significance.

Option 3: Places of significance will be mapped and included in the plan before protection is to be provided

Opportunity to be mapped in plan?	Guidance for describing and identifying places of significance	Protection provided
Yes	Robust process and defined values/locations included in Regional Plan.	Policy = avoid more than minor effects on identified places of significance mapped in the Regional Plan. Consent generally required for activities that are likely to have adverse effects on place of significance mapped in the Regional Plan.

The definition and the assessment process is included in the plan, but protection is only provided once the place has been mapped and included in the plan. Places of significance would need to be included in the plan through a variation or a plan change.

3.2.7 High level objectives and measures

Section 32 requires an assessment of *"...the efficiency and effectiveness of the provisions in achieving the objectives..."*. Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section 1.6 'Evaluation approach' for more details.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. They also signal a direction for where we want to head, without stating how far we go – that comes later (they are the beginnings of objectives).

Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against.

High level objective	Measure
Minimise adverse effects on places of significance.	Level of control over adverse effects of use and development on places of significance: 1 = no controls 2 = some control over adverse effects 3 = control over most adverse effects 4 = control over all adverse effects

High level objective	Measure
	5 = no adverse effects allowable
Maximise certainty of where places of significance are that may be at risk and how effects are assessed.	Robustness of process for identifying, whether the location is identified and how accessible the information is. 1 = no agreed process in Regional Plan 2 = brief process not requiring engagement of tangata whenua community 3 = robust process for identification, some mapped in Regional Plan 4 = robust process for identification, most mapped in Regional Plan 5 = very clear process comprehensively applied and all mapped in Regional plan.
Minimise costs to resource users (actual and opportunity costs).	The cost of the analysis (excluding mitigation costs) is appropriate for the scale of activity. Cost is: 1 = significantly above optimum cost 2 = unpredictable 3 = at or near optimum cost 4 = low

Explanation for the high level objectives and measures

Minimise adverse effects on places of significance.

The controls need to be effective when implemented through rules. Inclusion in rules must be relevant to potential impacts and applied to appropriate activity classes. The identification process for places of significance requires describing and locating the values to be protected. This degree of specificity both enables effective protection while allowing activities at a site or within a landscape which have no impact on the values. This differs from the common approach which prohibits all activities within a site or a landscape. By requiring that the effects are managed the level of control is 5, ie no adverse effects allowable.

Maximise certainty of where places of significance are that may be at risk and how effects are assessed.

The process needs to be robust so that its results are defensible. An essential component of that process is the appropriate and effective engagement and involvement of the relevant tangata whenua community. They hold the knowledge of the existence of the place of significance, which is often unknown to the general public. They understand the values of the place, and how they should be protected. While rigorous processes can be designed to appear to meet the evidential requirements of results, without the tangata whenua community engagement those results will be of little value. For instance, limited consultation with a few within the community may produce a result, but this could be at odds with the consensual view of the whole community.

Without appropriate analysis, the identification of potential impacts is unlikely to be achieved. Without focus and best practice guidance, analysis may be of little worth in identification of locations and management of options. Further, that analysis needs to be able to be given full consideration in the consenting process.

Applicants need certainty of location and potential values to be impacted. Tangata whenua need certainty that a robust process will identify and enable protection of values.

There has not been a comprehensive investigation to identify all Places and map them into the Plan. The certainty of identification is therefore 3 = robust process for identification, some mapped in Regional Plan.

Minimise costs to resource users (actual and opportunity costs).

The low cost of assessment for less robust processes will be offset by potentially very high costs when an unidentified site is negatively impacted. These costs can include delay in a project, redesign or relocation, or having to abandon the project. Also penalties can be levied for damage to sites when a precautionary approach has not been implemented appropriately. Lack of information from a robust process with defensible results could have the consequence of lengthy and disputatious consent processes.

When a Place of Significance has been identified and scheduled in the plan the values which can be affected and their location will be clearly described. A consent application can then be developed to ensure that the impacts are managed. While there is a cost to the council for the relevant plan change, there will be no cost to the applicant. For Places which are not mapped into the Plan, and for which there is evidence that in respect of a consent application a Place may exist and may be affected, the cost of investigation would be included in the development of the AEE. In general the costs for this would be less than the costs of accidental impact.

3.2.8 Evaluating the management options

High level objective and measure	Option 1: Do nothing	Option 2: A definition, an assessment process and protection policy (preferred)	Option 3: Places mapped and included in plan
Minimise adverse effects on places of significance. *Measure* Level of control over adverse effects of use and development on places of significance: 1 = no controls 2 = some control over adverse effects 3 = control over most adverse effects 4 = control over all adverse effects 5 = no adverse effects allowable	2 = some control over adverse effects	3 = control over most adverse effects	2 = some control over adverse effects
Maximise certainty of where places of significance are that may be at risk and how effects are assessed. *Measure* Robustness of process for identifying, whether the location is identified and how accessible the information is.	1 = no agreed process in Regional Plan	3 = robust process for identification, some mapped in Regional Plan	4 = very clear process comprehensively applied and all mapped in Regional plan.

High level objective and measure	Option 1: Do nothing	Option 2: A definition, an assessment process and protection policy (preferred)	Option 3: Places mapped and included in plan
1 = no agreed process in Regional Plan 2 = brief process not requiring engagement of tangata whenua community 3 = robust process for identification, some mapped in Regional Plan 4 = robust process for identification, most mapped in Regional Plan 5 = very clear process comprehensively applied and all mapped in Regional plan.			
Minimise costs to resource users (actual and opportunity costs). *Measure* The cost of the analysis (excluding mitigation costs) is appropriate for the scale of activity. Cost is: 1 = significantly above optimum cost 2 = unpredictable 3 = at or near optimum cost 4 = low	2 = unpredictable.	3 = appropriate	1 = significantly above optimum cost.

Certainty of evaluation

Minimise adverse effects on places of significance.

The degree to which control is effective is as much a consequence of the rules and their conditions as it is of there being an adequate identification process. Without identification there would be little or nothing to which to apply the rules.

Maximise certainty of where places of significance are that may be at risk and how effects are assessed.

An agreed process, which would have tangata whenua support as a result of Schedule 1 processes, would be very likely to be supported and used by tangata whenua. To some extent this will depend on the capacity of tangata whenua groups to engage with and implement the processes.

Many places of significance to tangata whenua are not known outside the relevant community. Developers would often want to avoid the costs of investigation and risk potential impacts. Lack of a robust identification process would be highly likely to lead to inappropriate activities being enabled. The historic heritage resources are likely to differ from the places of significance to tangata whenua, and there identification process does not specifically include tangata whenua communities.

Minimise costs to resource users (actual and opportunity costs)

An immediate cost savings to applicants could result from there not being any identification process implemented. However, while the probability in specific cases may be hard or impossible to determine, overall it is likely that without such an identification process being implemented unforeseen impacts could adversely affect tangata whenua values. The lost opportunity costs for delay or abandonment of a project, along with punitive costs, could be considerable. So while low costs could be often anticipated when there is no identification process implemented, there is uncertainty about the higher potential costs of so doing.

It would be expected that often identification processes would be implemented in response to resource consent applications.

A comprehensive identification process would be expensive and highly time consuming. It would also be likely to be applied in locations where there was little or no relevant development potential. However comprehensive the process was, some places of significance would fail to be identified and a policy framework would still be needed.

Time-frame for the evaluation

The time-frame is over the life of the plan (10-15 years)

The preferred management option

Option 2 is the preferred option. It provides protection to places with a robust identification and assessment process with engagement of the relevant tangata whenua community. Neither of the other two options achieve that.

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4 Water quality

4.1 Legal background

The Resource Management Act 1991 (RMA) is the principal statute governing the management of New Zealand's water resources and it tasks regional councils with managing the quality of fresh and coastal waters. This is largely done through regional plans, which contain water management objectives, policies and rules.

The RMA provides regional councils with strong regulatory functions for maintaining and enhancing water quality, including setting water quality standards, controlling the use of land and discharges, and allocating the capacity of water to different resource users to assimilate the discharge of a contaminant.[1]

Importantly, regional plans have an enabling role because under the RMA discharges are not allowed unless authorised by a rule in a regional plan or resource consent issued by a council.[2] That is, regional plans can permit activities that would otherwise require resource consent under the RMA. On the other hand, uses of land that affect water quality (diffuse discharges) are generally permitted under the RMA unless controlled by a rule in a regional plan.[3]

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1 *Section 30, RMA.*
2 *Section 15(1), RMA.*
3 *Section 9(2), RMA.*

4.2 Planning documents

National policy statements, issued by central government, can direct the RMA functions of regional councils. They state objectives and policies that regional councils must give effect to in their plans and have regard to when considering applications for resource consents.

Currently there are two national policy statements that direct the water quality management functions of regional councils. They were both issued after the Regional Water and Soil Plan and Regional Coastal Plan were made operative. The National Policy Statement for Freshwater Management 2014 requires the council to establish freshwater objectives and freshwater quality limits for all freshwater management units (a water body or a group of water bodies) within the region, and methods including rules to manage discharges so that objectives and limits are met.

The New Zealand Coastal Policy Statement 2010 contains three policies that direct the council in its management of coastal water quality, which are summarised as follows:[4]

- Identify and put in place actions (rules and/or non-regulatory initiatives) to improve coastal waters that have been contaminated to the point that they are having significant adverse effects on beneficial values of water, for example, aquatic ecosystems, swimming, and cultural activities such as fishing and gathering shellfish;
- Monitor sedimentation and its effects on the coastal environment and control sources of sediment; and
- Carry out and put in place specific actions to manage point source discharges to the coastal environment, including sewage, stormwater, and discharges from ports and marine facilities.

The Regional Policy Statement for Northland 2016 also provides direction on water quality management. It requires the council to provide for the following outcomes when setting objectives, water quality limits and other regulatory measures in the new regional plan: [5]

- A reduction in the overall Trophic Level Index status of the region's lakes;
- An increase in the overall Macroinvertebrate Community Index status of the region's rivers and streams;
- A reduction in sedimentation rates in the region's estuaries and harbours;
- Improved microbiological water quality at popular contact recreation sites, recreational and cultural shellfish gathering sites, and commercial shellfish growing areas in order to minimise risk to human health; and
- Protection of the quality of registered drinking water supplies and the potable quality of other drinking water sources.

Relevant statutory and policy provisions are covered in more detail later in this report.

4 *Policies 21-23, New Zealand Coastal Policy Statement.*

5 *Objective 3.2, Regional Policy Statement for Northland 2016.*

4.3 Activities not assessed

This report looks at options for regulating the main types of discharges in Northland. However, it does not identify and assess options to control diffuse discharges of phosphorus and nitrogen to Northland's rivers and estuaries.

On the whole, these nutrients do not appear to be causing any widespread nuisance aquatic plant or algae issues in rivers. The majority of river water quality monitoring sites, representative of rivers that support periphyton, are in "A" or "B" attribute states for periphyton biomass.[6] Moreover, levels of chlorophyll-a (an indicator of phytoplankton biomass) in Northland's estuaries are below recommended default Australian and New Zealand guidelines for estuarine and marine waters[7].

However there are some localised issues with periphyton and the council is collecting information to better understand the drivers of elevated periphyton biomass. Recent research suggests that there are few statistically meaningful relationships between chlorophyll a levels and dissolved reactive phosphorus (DRP) and dissolved inorganic nitrogen (DIN).[8] In other words, the research indicates that, on the face of it, nutrients do not appear to be a strong causal factors for periphyton growth at the river water quality monitoring sites in Northland. That said, the council has just less than three years of data and more data and analysis is required before these initial findings can be confirmed (circa. 2018).

Nationally, research shows that the factors influencing periphyton biomass are multiple and complex.[9] This is also true in Northland where data reveals variation in biomass between sites with similar catchment land uses. Factors include, for example, fine sediment inputs from surrounding land uses (which impact the ability of macroinvertebrates to graze or, where loads are high, create an unstable substrate unsuitable for periphyton to become established), light, temperature, flow regimes (including frequency, magnitude and duration),[10] macroinvertebrates, and river substrates.

It is also useful to note that most of Northland's rivers are generally turbid and have soft beds mainly comprised of fine sediments, and consequently they do not support much periphyton.[11] While the proliferation of macrophytes (aquatic plants) appear to be an issue in some rivers there is a high level of uncertainty about the relationships between dissolved nutrient levels and macrophyte biomass, and the effects of different levels of macrophyte biomass on aquatic ecosystems and other values. The uncertainty is best addressed at a national scale.

At the time of writing this report the Government proposed several changes to the National Policy Statement for Freshwater Management[12]. The proposals include the requirement to establish in-stream concentration standards for dissolved inorganic nitrogen and dissolved reactive phosphorus for the purpose of managing periphyton biomass in rivers. Due the uncertainty around the proposed changes (that is, whether the Government will adopt them) and our need to do more research on the state and drivers of periphyton biomass in rivers, we have delayed the setting of objectives and limits for periphyton and nutrients to a later date.

Elevated levels of nutrients do however appear to be causing eutrophication issues in a number of Northland's dune lakes.[13] Options to addresses this issue are discussed later in this report.

It is also important to note that we have non-regulatory programme for reducing diffuse sediment losses from highly erodible land. It involves the development and implementation of farm water quality improvement plans ("farm plans"), which mainly focus on stabilising highly erodible land with woody vegetation, and in some cases fencing water bodies and restoring wetlands. Poplar trees and fences are subsidised by the council. There is strong demand on the programme and we do not see the need at this stage to require farm plans by way of rules.

6 *See Appendix 2 of the National Policy Statement for Freshwater Management 2014*

7 *Table 3.3.2, ANZECC 2000.*

8 *Tanya Gray. 2012. State of the Environment Monitoring of Periphyton at Northland's River Water Quality Monitoring Network Sites 2007-2012. Prepared for Northland Regional Council by TEC Services Ltd.; and Northland Regional Council. Unpublished. Periphyton interim data review: February 2013 – July 2016.*

9 *Cathy Kilroy. 2012.Periphyton in the Manawatu Whanganui region: review of three years of monitoring. NIWA Client Report No: CHCH2012-105*

10 *For example, see Depree C., Walter K., 2016. Average annual and seasonal accrual periods for Northland streams. Prepared for Northland Regional Council. NIWA Client Report No: HAM2016-020.*

11 *See Snelder T., Biggs B., Kilroy C., Booker D., 2013. National Objective Framework for periphyton. Prepared for Ministry for the Environment. NIWA Client Report No: CHC2013-122.*

12 *Clean Water 2017*

13 *See Kelly D. J., Peacock L., Jiang W., 2016. Nutrient management for Northland's dune lakes. Cawthron Report No: 2796.*

4.4 Freshwater quality objectives and limits

4.4.1 Executive summary

The National Policy Statement for Freshwater Management 2014 requires us to set, in regional plans, freshwater quality objectives and water quality limits[14] for all freshwater management units[15] within the region.

Rivers

The National Policy Statement for Freshwater Management (NPS-FM) requires regional councils to set river water quality objectives (standards) for concentrations of chlorophyll a (a measure of periphyton biomass), nitrate (toxicity), ammonia (toxicity), dissolved oxygen (below point source discharges), and *E.coli* (for secondary contact recreation).

At the time of writing this report the Government proposed several changes to the NPS-FM[16], including a requirement to establish in-stream objectives for dissolved inorganic nitrogen and dissolved reactive phosphorus (for the purposes of achieving periphyton objectives) and new attribute states for *E.coli* (for the purposes of protecting human health associated with primary contact recreation). In light of the proposed changes, the council decided to delay the establishment of objectives for periphyton and nutrients (for managing trophic states in rivers) until the changes to the NPS-FM have been made and we have more data on the state and drivers of periphyton. Similarly the council will delay the setting of objectives for *E.coli* until the NPS-FM is updated. We are also not in the position at this time to be able to set objectives for dissolved oxygen levels due to a lack of robust data.

It is important to note that the NPS-FM does not currently contain attributes relating to suspended and deposited fine sediment, the main contaminant of concern in Northland. The Government has stated that it intends to include sediment attributes in the policy statement and work is currently underway to develop them[17]. Therefore we will wait on future amendments to the NPS-FM and, in the interim, continue to control discharges of sediment without directly linking the controls to numeric freshwater quality objectives.

So at this stage we are only proposing to include numeric freshwater quality objectives (water quality standards) in the plan for nitrate and ammonia toxicity . Water quality data from Northland's rivers show that nitrate concentrations are, with the odd exception, in the "A" attribute state for toxicity. That means, concentrations of nitrate in the region's rivers are unlikely to cause toxic effects on aquatic species. Median concentrations of ammonia are in most areas are in a "B" state, which means that the concentrations occasionally start impacting on the five percent most sensitive species. In other words, most of the region's rivers are in the same attribute states for nitrate and ammonia toxicity concentrations. Consequently it is appropriate to apply the same objectives for ammonia and nitrate toxicity to all of the region's rivers, the exception being outstanding rivers which have ammonia and nitrate toxicity concentrations in the "A" attribute states.

In other words, we do not consider that it is necessary at this stage to differentiate Northland's rivers and streams into freshwater management units for the purposes of managing nitrate and ammonia concentrations for toxicity effects on aquatic ecosystems. That being said, we are proposing to provide a higher level of protection for outstanding rivers.

Lakes

We are proposing to group Northland's lakes into two management units (shallow lakes and deep lakes) on the grounds that lake depth is the single factor that best discriminates variation in lake water quality in the region.[18]

14 *A water quality limit is broadly defined as the maximum amount of resource use available, which allows a freshwater objective to be met.*

15 *A freshwater management unit is a water body, multiple water bodies, or any part of a water body determined by the regional council as the appropriate spatial scale for setting freshwater objectives and limits and for freshwater accounting and management purposes.*

16 *Clean Water 2017*

17 *See Hicks, D.M, et al. 2016. Sediment Attributes Stage 1. Prepared for Ministry for the Environment. NIWA Client Report No: CHC2016-058.*

18 *Snelder, T., Hughes, B., Kelly, D., Stephens, T. 2016. Lake FMUs for Northland: Recommendations for policy development. Prepared for Northland Regional Council. LWP Client Report Number: 2016-003.*

The NPS-FM requires lake water quality objectives to provide for, at a minimum, safeguarding the life-supporting capacity of aquatic ecosystems and human health (during secondary contact recreation) by using the following compulsory attributes: phytoplankton (as measured by chlorophyll-a), total nitrogen, total phosphorus, ammonia toxicity, *E.coli*, and cyanobacteria.

We assessed different lake water quality objectives that provide for an overall improvement in the trophic level status of the region's lakes – consistent with the direction in the Regional Policy Statement for Northland 2016. In summary, we consider that it is appropriate to set a water quality objective for the region's shallow lakes (<10m deep) that they are in a eutrophic state or better. We consider that a water quality objective for deep lakes (≥10m deep) is that they are in mesotrophic state or better. The objectives provide for an overall improvement in the quality of water both lake management units.

The types of interventions needed to maintain and improve the lakes within each management unit are likely to include excluding livestock from lakes, riparian setbacks (buffers) for land disturbance activities within the lake catchments (most lakes are phosphorus limited, and phosphorus levels are strongly influenced by sediment and the good management practices of farming and forestry operations.

Achieving more aspirational water quality objectives is likely to require advance mitigations in primary production activities, land use changes, and in-lake remediation's for some lakes. It is important to note that there are currently large uncertainties and information gaps about sources and pathways of nutrients, and levels of attenuation within groundwater and lakes, which we are looking to address over time.

Lastly, we will also delay the setting of *E.coli* objectives for lakes until the the proposed changes to the NSP-FM have been finalised.

Wetlands and aquifers

The NPS-FM does not contain any water quality attributes for wetlands or aquifers. The council does not have sufficient information on appropriate water quality conditions in these water bodies to be able to set water quality objectives and limits for them. Besides we are not aware of any significant water quality related issues with the region's aquifers and wetlands.

For these reasons, the council considers that it is appropriate to wait on future national direction or guidance on the setting of water quality objectives and limits for lakes and not include any in the proposed new regional plan. However, the council will continue in the interim to manage discharges and other activities to avoid, remedy or mitigate adverse effects on these water bodies.

All water bodies – anti-degradation policy

Water quality often varies naturally, temporally and spatially, within and between water bodies. When setting water quality objectives for a group of similar water bodies there will often be some that have better, or conversely worse, water quality than the standard set in water quality objectives.

The National Policy Statement for Freshwater Management implicitly recognises this fact by requiring that overall water quality in a freshwater management unit is maintained or enhanced, provided that the water quality objectives are set above national bottom lines:[19]

We consider that it is appropriate to include an 'anti-degradation' policy in the new plan, which would state that the an application for a resource consent that would allow a water quality or sediment quality standard to be exceeded or further exceeded will generally be declined. The policy would help reinforce the direction in the National Policy Statement for Freshwater Management and the Regional Policy Statement to improve the overall quality of Northland's fresh and coastal waters and avoid water quality objectives from being compromised. [20]

We suggest though that an exception be made for lowering the quality of water if the values and uses of the freshwater body or coastal water are not adversely affected by the exceedance.

4.4.2 Relevant provisions

This evaluation supports the following Regional Plan provisions:

19 *Policy CA3, National Policy Statement for Freshwater Management.*

20 *See Regional Policy Statement for Northland 2016.*

- Policy D.4.1 - Water quality standards for rivers
- Policy D.4.2 - Water quality standards for lakes
- Policy D.4.5 - Maintaining overall water quality

4.4.3 The problem, opportunity and/or requirement

A key directive of the NPS-FM is that regional councils must set, in plans, freshwater objectives and associated limits for all freshwater management units in a region[21]. Freshwater management units are defined in the policy statement as a "water body, multiple water bodies or any part of a water body determined by the regional council as the appropriate spatial scale for setting freshwater objectives and limits and for freshwater accounting and management purposes."

Simply put, water quality objective state the maximum or minimum levels of water quality characteristics ("attributes" [22]) that support the value(s). In other words, they specify the water quality conditions that a water body is to be managed to. Under the NPS-FM, freshwater objectives must provide at a minimum for two compulsory values: the health of aquatic ecosystems and the health of people associated with secondary contact recreation in water. The terms water quality objective and water quality standard are used interchangeably in this report.

A water quality limit is broadly defined in the NPS-FM as "the maximum amount of resource use available, which allows a freshwater objective to be met." The term "water quality limit" is currently interpreted in a number of different ways and there is no strong agreement on what it means within a regional plan. It is not used in the RMA.

Rivers

Research has revealed that there are no strong statistical relationships between water quality variables and individually many of them are not strongly associated with catchment characteristics.[23] It is, therefore, very difficult to make regional generalisations about Northland's river water quality patterns. Different attributes of river water quality (for example, clarity versus nutrients) vary independently of each other and the drivers of river water quality appear to be different for each attribute. Unlike most other regions in New Zealand it is difficult to develop a river classification that differentiates Northland's rivers according to variation in catchment characteristics and land uses.

The NPS-FM requires river water quality objectives to be set for five compulsory attributes (periphyton, ammonia toxicity, nitrate toxicity, dissolved oxygen below point source discharges, and *E.coli*). Periphyton (measured as chlorophyll-a) is an indicator of the trophic state of rivers. Its growth is primarily driven by nutrient supply, light, temperature, and substrate. Reduction and loss of periphyton biomass is caused by high flows and to a lesser extent grazing by invertebrates. The majority of Northland's rivers are generally turbid and have soft substrates and typically do not support conspicuous periphyton.

While macrophytes appear to be an issue in some rivers there is a high level of uncertainty about the relationship between dissolved nutrient levels and macrophyte growth. Macrophytes generally obtain their nutrient requirements through their roots.

At high levels ammonia and nitrate can be toxicants that can cause lethal (acute) or sub-lethal (chronic) effects on aquatic species. Sufficient dissolved oxygen is a fundamental requirement for aquatic life. Low levels can have acute and chronic impacts on aquatic species. Dissolved oxygen varies over a 24 hour period as a consequence of the metabolism of macrophytes and periphyton, and minimum dissolved level usually occurs prior to sunrise. The time of the year also affects minimum dissolved oxygen concentrations, with lowest levels usually in summer when temperature is high, and periphyton and macrophyte biomass is also higher. Currently the NPS-FM only requires standards to be set for dissolved oxygen below point source discharges.

21 *Policies A1 and B1, National Policy Statement for Freshwater Management 2014.*

22 *An attribute is a measurable characteristic of freshwater, including physical, chemical and biological properties, which supports particular values.*

23 *Snelder T., 2015. Defining Freshwater Management Units for Northland: A Recommended Approach. Prepared for Northland Regional Council by LWP Ltd; and Snelder, T., Kerr, T. 2017. Alternative river classification options based on water quality observations. Prepared for Northland Regional Council by LWP Ltd.*

E.coli is an indicator of the presence of faecal pathogens in fresh water. Relationships between *E.coli* and the risk of infection by *Campylobacter* underpin the compulsory (for secondary contact recreation) and optional *E.coli* attribute (for primary contact recreation) states.[24]

It is important to note that recent research suggests that it may not be possible to achieve the optional *E.coli* attribute states for primary contact recreation (swimming) in Northland rivers and the Waikato and Waipa rivers using available mitigations (e.g. stock exclusion). [25] Recent research suggests that there are elevated levels of *E.coli* in Northland's rivers that are not totally attributed to faecal sources. It may be that these high numbers of *E.coli* are related to faecal inputs that current faecal source tracking tools cannot identify, such as certain wild animals. However, it is now recognised that some faecal indicator bacteria in water may not be associated with faecal contamination, and therefore may overestimate health risk. In fact, some strains of faecal derived *E.coli* have developed the capability of persisting in the environment far removed from an animal's intestines.[26]

Recent water quality testing at three sites in Northland confirm these findings. Preliminary results indicated that most samples contained non-faecal *E.coli* with a prevalence ranging from nine to 20 percent of total *E.coli* present in most water samples. Further testing will determine the proportion of faecal *E.coli* belonging to the group which tends to persist in the environment.

The current version of the NPS-FM contains a limited number of attributes. It does not contain attributes relating to fine sediment such as total suspended sediment, water clarity, visual clarity, and sedimentation rates. This is mainly because currently there are large uncertainties about the relationships between the attributes and water quality dependent values.

The Government has committed resources to addressing these uncertainties and intends to progressively update the NPS-FM. Because of this, we will wait on future amendments to the policy statement rather than specifying its own attribute states in the new plan, and in the interim continue to control sources of sediment and other attributes without directly linking the controls to water quality objectives or limits.

During the writing of this report the Government proposed several changes to the NPS-FM. Proposals include changes to the *E.coli* attribute table, making primary contact recreation a compulsory value, and a requirement to establish in-stream objectives for concentrations of dissolved inorganic nitrogen and dissolved reactive phosphorus for the purposes of managing for the compulsory periphyton attribute. Given the current uncertainty around the proposed changes to the policy statement and the need to get better information on the state and drivers of periphyton and dissolved oxygen in Northland, we have delayed defining river water quality management units and setting freshwater objectives for periphyton, potentially nutrients, dissolved oxygen levels, and *E.coli* until a later date (that is, by a plan change in the future). As an aside, it is also proving difficult to classify Northland's rivers into management units.

So at this stage we are only proposing to set numeric water quality objectives (water quality standards) for nitrate and ammonica toxicity. Water quality data from Northland's rivers show that nitrate concentrations are, with the odd exception, in the "A" attribute state for toxicity. That means, concentrations of nitrate in the region's rivers are unlikely to cause toxic effects on aquatic species. Median concentrations of ammonia are in most areas are in a "B" state, which means that the concentrations occasionally start impacting on the five percent most sensitive species. In other words, most of the region's rivers are in the same attribute states for nitrate and ammonia toxicity concentrations. Consequently it is appropriate to apply the same standards for ammonia and nitrate toxicity to all of the region's rivers, the exception being outstanding rivers which have ammonia and nitrate toxicity concentrations in the "A" attribute states.

We consider that this is a low risk option, particularly given that it is unlikely that there will be a significant increase in agricultural intensification in Northland's river catchments because of environmental constraints such as soils and climate. This is reinforced by the Parliamentary Commissioner for the Environment's predictions that Northland is unlikely to experience significant intensification in land use.[27]

24 *See McBride G., 2012. Issues in setting secondary contact recreation guidelines for New Zealand freshwaters. Prepared for Ministry for the Environment. NIWA, Hamilton.*

25 *See Daigneault A., Samarasinghe O., 2015. Whangarei Harbour sediment and E.coli study: Catchment economic modelling. Prepared for Ministry for Primary Industries. Landcare Research Contract Report: LC2421; and Doole G., Elliot S., McDonald G., 2015. Economic evaluation of scenarios for water-quality improvement in the Waikato and Waipa River catchments: Assessment of the first set of scenarios. Prepared for the Technical Leaders Group of the Healthy Rivers/Wai Ora Project. Report No. HR/TLG/2015-2016/4.1.*

26 *Megan Devane. Updated. The sources of "natural" microorganisms in streams. Prepared for Environment Southland and West Coastal Regional Council. ESR Client Report No: CSC 15004.*

27 *Parliamentary Commissioner for the Environment, 2013. Water quality in New Zealand: Land use and nutrient pollution.*

Lakes

Northland contains approximately 240 lakes that are greater than one hectare in size, of which approximately 179 are dune lakes and the balance being artificial, alluvial and volcanic lakes. Around 188 lakes of less than one hectare have also been identified. Plantation forestry, drystock farming and native vegetation cover are the main land uses in the lake catchments.

Dune lakes are a rare type of aquatic ecosystem that mainly occur in New Zealand, Australia, Madagascar, and the south-eastern coast of the United States of America. In New Zealand, the majority of dune lakes are situated along the west coast of the North Island, particularly through Northland but extending south through to the Wellington region. There are also some small pockets of dune lakes along the west coast of the South Island. Northland is considered to have the highest concentration and best remaining dune lakes in New Zealand. Three large clusters are situated on the Pouto Peninsula, the Aupouri Peninsula, and the Kai Iwi lakes north-west of Dargaville. In addition to their uniqueness and high ecological values, Northland's dune lakes represent a large proportion of warm, lowland New Zealand lakes with relatively good water quality.[28]

Research suggests that Northland's lakes should be grouped into, at a minimum, two lake management units for the purposes of setting freshwater quality and quantity objectives and limits:[29] (1) shallow lakes (less than 10 metres maximum depth), and (2) deep lakes (more than 10 metres maximum depth).

The NPS-FM requires the council to set lake water quality objectives (water quality standards) for the following compulsory attributes: phytoplankton (chlorophyll-a), total nitrogen (TN), total phosphorus (TP), ammonia (toxicity), *E.coli*, and cyanobacteria.[30]

The council routinely monitors a number of water quality parameters (attributes) in 26 dune lakes and one volcanic lake (Omapere). The monitored lakes include most of the high value dune lakes in Northland and a representative selection of other dune lakes.[31] For the five-year period (2010-2014):

- Two lakes were in an oligotrophic condition (often having very clear waters and deep growing aquatic plants (macrophytes) because of their low nutrient content);
- 10 lakes were in a mesotrophic condition (typically having clear water with beds of submerged plants as a result of moderate nutrient levels);
- 12 were in a eutrophic condition (moderately impacted by high algal and plant biomass arising from nutrient levels that are elevated well above natural conditions, and have poor water clarity); and
- Two were in a supertrophic condition (very high nutrient levels and algae blooms).

Note that oligotrophic, mesotrophic, eutrophic and supertrophic states closely correspond to the "A", "B", "C" and "D" attribute states in the NPS-FM for chlorophyll-a, TN and TP.

A recent analysis of lake water quality data for the six-year period (2009-2014) found:[32]

- Five lakes failed the national bottom-line (that is, poorer condition than a "C" attribute state) for TN;
- Five lakes failed the chlorophyll-a median bottom-line;
- One lake failed to meet the chlorophyll-a maxima bottom-line;
- All of the lakes that failed the national bottom-lines were shallow (<10 m) lakes; and
- All of the monitored lakes passed the national bottom-line for TP and both median and maximum bottom-lines for ammonia toxicity.

28 *Verburg P., Hamill K., Unwin M., Abell J., 2010. Lakes water quality in New Zealand 2010: Status and trends. Prepared for the Ministry for the Environment. NIWA Client Report HAM2010-107.*

29 *Snelder T., Hughes B., Kelly D., Stephens T., 2016. Lake FMUs for Northland: Recommendations for Policy development. Prepared for Northland Regional Council. LWP Client Report Number: 2016-003.*

30 *The following lakes have been identified as outstanding freshwater bodies: Lakes Tahoroa, Humuhumu, Waikare, Rotokawau (Pouto), Mokeno, Kai-Iwi, Ngatu, Wahakarei, Kanono, Waiporohita, Waihopo and Morehurehu. See Champion P, de Winton M., 2012. Northland Lakes Strategy. Prepared for Northland Regional Council. NIWA Client Report No: HAM2012-121.*

31 *For further information on the monitoring programme see Hughes A., et al., 2011. Overview of Northland Regional Council's Freshwater Quality Monitoring Programmes. Prepared for Northland Regional Council. NIWA Client Report No: HAM2011-090.*

32 *Snelder T., Hughes B., Kelly D., Stephens T., 2016. Lake FMUs for Northland: Recommendations for Policy development. Prepared for Northland Regional Council. LWP Client Report Number: 2016-003.*

Research suggests that a large proportion of Northland's dune lakes are phosphorus limited, although there are a number of instances where co-limitation by both nitrogen and phosphorus occurs. Nutrient limitation refers to the situation where the growth of aquatic plants and algae is limited by the availability of one or more nutrient. Limitation by a single nutrient does not mean that only the single nutrient is important to lake water quality dynamics, but it can provide information on prioritising management interventions to get the greatest improvement in water quality.[33]

Regarding lake water quality risks to human health, *E.coli* levels are only monitored in several lakes that are popular for contact recreation (lakes Ngatu, Taharoa, Rotopokaka, and Waro). Results show that the levels are in an "A" attribute state for primary contact recreation. In other words, people are exposed to a very low risk of infection when doing activities likely to involve full immersion. It is reasonable to assume, based on these results, that most of Northland's lakes have similar (that is, good) microbiological water quality. The health of humans and animals can also be affected by cyanobacteria, a group of photosynthetic, nitrogen fixing bacteria (also called blue-green algae), which can produce compounds that are toxic to people and animals. The council does not have information on cynanobacteria in Northland lakes, but is about to start monitoring several lakes that are popular for swimming.

Farming affects lake water quality through the runoff and leaching of phosphorus, nitrogen and sediment. Plantation forestry can impact on lake water quality during the harvest and post-harvest window phases due to the mobilisation of phosphorus (associated with sediment), nitrogen and tannins, although it is thought that water quality generally appears to return to pre-harvest concentrations within 2-5 years post-harvesting.[34] It has been theorised that the harvesting of plantation forests around lakes Morehurehu and Kai Iwi was responsible for increases in nitrogen and decreases in water clarity.[35]

Lastly, it is important to note that the management of lake water quality, particularly in shallow dune lakes, is complex. For example, nutrients can keep recycling in a lake once they are stored in lake sediments (the internal load) even if external inputs are dramatically reduced or stopped altogether. This makes improving lakes such lakes difficult. However, lakes that are moderately degraded generally respond well to a reduction in the external (catchment) loading, but those that are significantly degraded require a focus on the internal load (that is, nutrients within a lake). It may take up to 100 years for phosphorus loads in lake beds to be reduced to levels typical of pristine lakes by focussing on reducing loads from catchments.[36]

Wetlands and aquifers

We do not have sufficient information to be able to set water quality objectives and limits for Northland's wetlands and aquifers. Besides, the National Policy Statement for Freshwater Management does not contain any attributes for wetlands or aquifers. Nonetheless we consider that their quality and quantity can be protected by other regulation.

4.4.4 Management options

This section summarises the management options for freshwater quality objectives and limits.

All water bodies – anti-degradation policy

When setting water quality objectives (water quality standards) for a group of similar water bodies there will often be some that have better or conversely worse water quality than the standards. This is because water quality varies naturally within and between water bodies.

Recent case-law suggests that it is not appropriate to set water quality standards that allow degradation in water quality.[37] The ratio being that it is inconsistent with the "unqualified function imposed on regional councils" by Section 30(1)(c)(ii) of the RMA, namely the "maintenance and enhancement of the quality of water in water bodies and coastal water", and is incompatible with the requirements of Section 69(3) of the RMA, which states that:

33 *See Kelly D. J., Peacock L., Jiang W., 2016. Nutrient management for Northland's dune lakes. Prepared for Northland Regional Council. Cawthron Report No. 2796.*

34 *See Collier K. J.,1996. Potential Impacts of Plantation Forestry on Dune Lakes in Northland with Interim Guidelines for Riparian Management. Prepared for Department of Conservation. NIWA Client Report: DOC60204; Beets P., Garrett L., 2016. Nitrogen cycling in planted forest on Pinaki sands – Pouto catchment. Prepared for Northland Regional Council; Davis M., 2014. Nitrogen leaching losses from forests in New Zealand. New Zealand Journal of Forestry Science2014, 44:2.*

35 *See Ballinger J., et al., 2013. Northland Lakes water quality and ecology: State and trends 2007-2011. Northland Regional Council.*

36 *Doole G., Marsh D., 2015. Conceptual modelling of shallow dune lakes in the Northland region of New Zealand: Draft report. Prepared for Ministry or Primary Industries, Ministry of the Environment and Northland Regional Council. Department of Economics, University of Waikato.*

37 *Ngati Kahungunu Iwi Inc. v the Hawkes Bay Regional Council [2015] NZ Environment Court 50.*

"Subject to the need to allow for reasonable mixing of a discharged contaminant or water, a regional council shall not set standards in a plan which result, or may result, in a reduction of the quality of water in any waters at the time of the public notification of the proposed plan unless it is consistent with the purpose of the Act to do so."

However it is important to note that the court did not address the final words of Section 69(3) of the RMA, which on the face of it provide for the setting of standards below a current water quality state if "it is consistent with the Act to do so." This is particularly relevant given that section 45(1) of the RMA provides that the purpose of a national policy statement is to "state objectives and policies for matters of national significance that are relevant to achieving the purpose of this Act."

The NPS-FM implicitly provides for an 'unders and overs' type approach by requiring that overall water quality within a freshwater management unit is maintained or improved, provided that the water quality objectives are set above national bottom lines:[38]

"By every regional council ensuring that freshwater objectives for the compulsory values are set at or above the national bottom lines for all freshwater management units, unless the existing freshwater quality of the freshwater management unit is already below the national bottom line and the regional council considers it appropriate to set the freshwater objective below the national bottom line because:

a) the existing freshwater quality is caused by a naturally occurring process; or

b) any of the existing infrastructure listed in Appendix 3 contributes to the existing freshwater quality."

We consider that it is appropriate to include an 'anti-degradation' policy in the new plan, which would state that the an application for a resource consent that would allow a water quality or sediment quality standard to be exceeded or further exceeded will generally be declined. The policy would help reinforce the direction in the NPS-FM and the Regional Policy Statement to improve the overall quality of Northland's fresh and coastal waters and avoid water quality objectives from being compromised. We suggest though that an exception be made for lowering the quality of water if the values and uses of the freshwater body or coastal water are not adversely affected by the exceedance.

Rivers

As mentioned above we have decided to delay defining river water quality management units and setting river water quality objectives for periphyton, potentially nutrients, *E.coli,* and dissolved oxygen. This is because of the uncertainty around the changes to the NPS-FM and the need to improve our information on the state and drivers of these water quality attributes. So in the meantime, we are proposing to only set region-wide numeric water quality standards for nitrate and ammonia toxicity.

Lakes

This section identifies water quality objective options for Northland lake management units: deep lakes (≥10m) and shallow lakes (<10m). The management options are based solely on different lake trophic state (chlorophyll-a, total phosphorus, and total nitrogen), because the quality of water is generally high in terms of the other compulsory attributes in the NPS-FM (ammonia and *E.coli*). Over time we envisage that default water quality standards will be replaced with tailored (that is, lake-specific) standards for some high value lakes.

Shallow lakes

Shallow lakes are defined as lakes that have a maximum depth of less than 10 metres, which are most of Northland's lakes. The majority of shallow lakes in the council's water quality monitoring network are in a eutrophic state (12 of 18). Prior to human settlement, most shallow lakes would likely have been in a mesotrophic state[39] although the exact water quality conditions are poorly understood.[40]

38 *Policy CA3, National Policy Statement for Freshwater Management.*

39 *Lisa Forester, Environmental Manager, Northland Regional Council, personal communications, February 2016.*

40 *See Drake D., et al., 2009. Shallow coastal lakes in New Zealand: assessing indicators of ecological integrity and their relationships to broad-scale human pressures. Prepared for Department of Conservation. NIWA Client Report: CHC2009-005.*

Research has also revealed strong relationships between chlorophyll-a and in-lake median total phosphorus concentrations in Northland's lakes.[41] Between-lake variation in median total phosphorus concentration explained approximately 97% of the variation in chlorophyll-a for shallow lakes, and 74% for deep lakes. There is a weaker relationship and therefore greater uncertainties between in-lake total nitrogen concentrations with median chlorophyll-a. [42] Generally speaking, this means that it is more important to manage phosphorus loads to lakes than nitrogen loads. The research also found that:[43]

> *"...several of the lakes classified as [B attribute state] lakes for TP under the [National Policy Statement for Freshwater Management] framework would be classified as [C attribute state] lakes for median chlorophyll-a, and similarly [C attribute state] lakes for TP were [D attribute] state lakes for median chlorophyll-a. This has some important connotations for target setting under the Northland Regional Council regional plan, suggesting that lakes with a lower grade for TP may have to be targeted to achieve the intended targets for median chlorophyll-a."*

Option A: eutrophic ("C") state

The first option involves setting water quality standards that correspond to a eutrophic state (see Table 5 below). Legally, we cannot set a water quality standard for any attribute below a national bottom line, which corresponds to the boundary between a eutrophic and supertrophic state (see Appendix 2 of the NPS-FM).

It is likely that the most effective option to maintain or improve lakes to a eutrophic state is to manage total phosphorus levels to at least a "B" attribute state. It is important to reiterate that the anti-degradation policy described above would provide for the maintenance of higher quality lakes.

Table 5: number of monitored shallow lakes in each of the compulsory National Policy Statement for Freshwater Management attribute states (2009-2015). The shaded boxes represent this option.

Attribute state	Total Nitrogen (Annual Median, mg/m^3)	Total Phosphorus (Annual Median, mg/m^3)	Chlorophyll-a (Annual Median, mg/m^3)	Chlorophyll-a (Annual Max, mg/m^3)
A	0 (0%)	1 (6%)	0 (0%)	7 (44%)
B	5 (31%)	9 (56%)	6 (38%)	4 (25%)
C	6 (38%)	6 (38%)	5 (31%)	4 (25%)
D	5 (31%)	0 (0%)	5 (31%)	1 (6%)

The types of controls needed to maintain or improve lakes to at least a eutrophic state are likely to include the exclusion of stock from the beds and margins of lakes and contributing streams, minimum setbacks (buffers) from lakes for land disturbance activities, and other good management practices in farming and forestry operations.[44]

Option B: mesotrophic ("B") state

The second option involves setting water quality standards that correspond to a mesotrophic state (see Table 6 below). This would require reducing levels of total nitrogen and total phosphorus to at least "B" attribute states, particularly the lower end of the "B" attribute state for total phosphorus (>10 and ≤20 mg/m^3). However, it is important to reiterate that there are uncertainties regarding the relationship between total nitrogen and chlorophyll-a.

41 *Kelly D. J., Peacock L., Jiang W., 2016. Nutrient management for Northland's dune lakes. Prepared for Northland Regional Council. Cawthron Report No. 2796.*

42 *Ibid.*

43 *Ibid.*

44 *See Ministry for the Environment, 2005. Guidelines for Pastoral Management in the Catchment of Dune Lakes In Northland; Collier K. J.,1996. Potential Impacts of Plantation Forestry on Dune Lakes in Northland with Interim Guidelines for Riparian Management. Prepared for Department of Conservation. NIWA Client Report: DOC60204; Beets P., Garrett L., 2016. Nitrogen cycling in planted forest on Pinaki sands – Pouto catchment. Prepared for Northland Regional Council; Davis M., 2014. Nitrogen leaching losses from forests in New Zealand. New Zealand Journal of Forestry Science2014, 44:2.*

Table 6: number of monitored shallow lakes in each of the compulsory National Policy Statement for Freshwater Management attribute states (2009-2015). The shaded states represent this option.

Attribute state	Total nitrogen (annual median, mg/m^3)	Total phosphorus (annual median, mg/m^3)	Chlorophyll-a (annual median, mg/m^3)	Chlorophyll-a (annual max, mg/m^3)
A	0 (0%)	1 (6%)	0 (0%)	7 (44%)
B	5 (31%)	9 (56%)	6 (38%)	4 (25%)
C	6 (38%)	6 (38%)	5 (31%)	4 (25%)
D	5 (31%)	0 (0%)	5 (31%)	1 (6%)

Achieving a mesotrophic state in most shallow lakes is an overly ambitious objective, and is unlikely to be achieved without advanced mitigations, land use changes, and in-lake remediation for some lakes. Examples of advanced mitigations include property scale limits on nutrient inputs and losses, optimised stocking rates, and staged harvesting of forests. Even then, there are large uncertainties at this time about whether a mesotrophic state could be achieved in the foreseeable future given legacy nutrient loads, the effects of pest plants and animals, and effectiveness of advanced mitigations and land use changes.

Deep lakes

Deep lakes are defined as lakes that have a maximum depth greater than ten metres, and represent a small proportion of Northland's lakes. It is theorised that most deep lakes would have been in an oligotrophic state prior to the modification of their catchments.[45]

They generally have good water quality, however some deep lakes (for example, Kanono) have higher levels of total nitrogen and chlorophyll-a than expected and therefore have a greater risk of degrading water clarity and ecological values.[46] We recommend that water quality objectives for deep lakes should reflect their generally good condition, that is, mesotrophic state or better.

Option A: mesotrophic state ("B")

This option involves setting water quality standards for deep lakes that correspond with a mesotrophic state (see Table 7 below).

The key attribute is median chlorophyll-a, which represents typical algae biomass. Again, phosphorus is the key limiting nutrient of algal biomass and, based on research, should be managed to at least an "A" attribute state to achieve a "B" state for median phytoplankton (chlorophyll-a) levels. While the relationships between nitrogen levels and chlorophyll-a for the monitored deep lakes are not strong, it would be prudent as a precautionary measure that the objective would seek that total nitrogen is maintained and for several deep lakes improved to at least a "B" attribute state.

Table 7: number of monitored deep lakes in each of the compulsory National Policy Statement for Freshwater Management attribute states (2009-2015). The shaded boxes represent this option.

45 *Lisa Forester, Environmental Manager, Northland Regional Council, personal communications, February 2016.*

46 *Kelly D. J., Peacock L., Jiang W., 2016. Nutrient management for Northland's dune lakes. Prepared for Northland Regional Council. Cawthron Report No. 2796.*

Attribute state	Total Nitrogen (annual median, mg/m^3)	Total Phosphorus (annual median, mg/m^3)	Chlorophyll-a (annual median, mg/m^3)	Chlorophyll-a (annual max, mg/m^3)
A	1 (11%)	5 (56%)	3 (33%)	7 (78%)
B	5 (56%)	4 (44%)	4 (44%)	2 (22%)
C	3 (33%)	0 (0%)	2 (22%)	0 (0%)
D	0 (0%)	0 (0%)	0 (0%)	0 (0%)

We consider that the types of actions needed to achieve the objective for deep lakes would be the same as under option A for the shallow lakes, namely: stock exclusion, setbacks for land disturbance activities, and other good management practices in farming and forestry operations.

Option B: oligotrophic ("A") state

This option involves setting water quality standard for deep lakes that correspond with an oligotrophic state (see Table 8 below). The objective would specify "A" attribute states for both TN and TP, which in theory should result in a chlorophyll-a levels also meeting an "A" attribute state.

It is important to note that the majority of Northland's monitored deep lakes are in a mesotrophic state, the exceptions being lakes Taharoa and Waikare. Therefore, significant interventions would be required to improve lake water quality in most deep lakes, including for example land use changes and in-lake remediation (for example, alum dosing and removing nutrient-rich sediment from lake beds). It is important to note though that that the effectiveness of these mitigations on Northland's deep lakes have not been quantified.

Table 8: number of monitored deep lakes in each of the compulsory National Policy Statement for Freshwater Management attribute states (2009-2015). The shaded boxes represent this option.

Attribute state	Total Nitrogen Annual Median, mg/m^3	Total Phosphorus Annual Median, mg/m^3	Chlorophyll-a Annual Median, mg/m^3	Chlorophyll-a Annual Max, mg/m^3
A	1 (11%)	5 (56%)	3 (33%)	7 (78%)
B	5 (56%)	4 (44%)	4 (44%)	2 (22%)
C	3 (33%)	0 (0%)	2 (22%)	0 (0%)
D	0 (0%)	0 (0%)	0 (0%)	0 (0%)

4.4.5 High level objectives and measures

Section 32 of the RMA requires the council to assess the efficiency and effectiveness (that is, the appropriateness) of proposed provisions. We have done does this by assessing the management options against a set of high level objectives and measures. Refer to the section "Evaluation approach" for more details.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. Measures make the high level objectives specific and they are a metric for testing and comparing management options.

Lakes

High level objective	Measures
Maximise the ecological integrity of Northland's lakes.	• Macrophyte depth (metres). • Visual clarity (metres). • Macroinvertebrate diversity (species diversity relative to other option/s).
Minimise costs to resource users and/or council.	Level of intervention (mitigation and/or remediation actions) required to achieve the desired management option (low cost, moderate costs, high costs, substantial costs).

Explanation for the high level objectives and measures

Enhance the ecological integrity of Northland's lakes

The key objective of the NPS-FM is to manage freshwater quality to safeguard the ecological integrity (health) of aquatic ecosystems. We have used three measures to consistently assess the impacts of the management options on the lake ecology.

The amount of nitrogen and phosphorus in a lake are the main drivers of its trophic state. Generally speaking, increasing the amount of the nutrients will increase the amount of phytoplankton in the water, which in turn reduces the depth that light can penetrate through the water column.

Macrophytes are strongly linked with nutrient levels due to their sensitivity to either increased phytoplankton abundance (which reduces light availability), or epiphytic growth on macrophytes. Macrophytes are an important ecological component of lakes because they provide habitat for macroinvertebrates and native fish. The depth at which macrophytes grow is a function of water clarity. Water clarity refers to the depth that light can penetrate water and provide macrophytes with enough energy to photosynthesise. Many of Northland's dune lakes are important habitats for native macrophytes and charophytes, some of which are rare or endangered, that can grow in deep environments.[47]

Visual clarity is related to water clarity, but refers to the depth that aquatic animals and people can see through water. Visual clarity is important for aquatic life because it affects the visual field of fish, invertebrates and birds, which is particularly important during foraging or when reacting to predators. It is also important to people as it affects the aesthetic quality and contact recreation safety. Generally speaking, the higher the visual clarity the healthier the lake ecosystem.

Aquatic macroinvertebrates (for example, insects, crustaceans, snails, worms) are also an important ecological component of lakes. They have significant roles in the food webs of lakes, such as feeding on living and decaying plants, algae, and fine detritus and each other; they are important food for fish and birds; and some, when they are in their adult winged stage, contribute to the food webs of terrestrial ecosystems.[48] Macroinvertebrate diversity (the number of different species present) has been shown to relate to the nutrient status of lakes.[49] Because we lack information about what constitutes an appropriate level of species diversity we have used a constructed measure – relative level of species diversity compared to another option.

47 *See Wells R., Champion P., 2014. Northland Lakes Ecological Status 2014. Prepared for Northland Regional Council. NIWA Client Report No: HAM2014-085.*

48 *Ball O. J. P., Pohe S. R., and Winterbourn M. J., 2009. The littoral macroinvertebrate fauna of 17 dune lakes on the Aupouri Peninsula, Northland. Unpublished report prepared by NorthTec (Environmental Sciences Department) for Northland Regional Council. Foundation for Research, Science and Technology Envirolink Grant: 681-NLRC-96, p36.*

49 *Kelly D. J., Peacock L., Jiang W., 2016. Nutrient management for Northland's dune lakes. Prepared for Northland Regional Council. Cawthron Report No. 2796.*

The following assessment of the management options is largely based on research[(50)] on the relationships between lake water quality (chlorophyll-a, total nitrogen and total phosphorus) and macrophyte depth, visual clarity and macroinvertebrates for the 26 lakes that the council routinely monitors.

Minimise costs to resource users and/or council

Management interventions such as controls on discharges, stock exclusion requirements and remediation actions come with a cost, either directly to land owners or the public (for example, in the form of council subsidies to land owners). The second high level objective is to minimise such costs.

It is very difficult to quantify the costs associated with achieving different water quality objectives across multiple lakes, let alone single lakes. This is because lakes vary in size, state, catchment land uses, the presence or absence of exotic plant and fish species, legacy loads, the types of plant and algal species they contain, and the nature of the attenuation pathways for example. Therefore, we have used a constructed measure as a proxy for actual costs. Low to moderate costs are typically associated with the implementation of good management practices, such as excluding stock from lakes and contributing streams, costs of preparing farm environmental management plans, loss of production associated with land disturbance setbacks (for example, loss of land for cultivation or plantation forestry). High to substantial costs are associated with changing land use (for example, dairying to dry stock), property scale limits on nutrient inputs and losses (for example, fertilisers), and lake remediation actions (for example, alum dosing, dredging).

High level objectives not included

Section 32(2)(a) of the RMA requires an assessment of the impacts on economic growth and employment opportunities. However, the impact of the options on these cannot be determined with any confidence. Therefore, economic growth and employment opportunities have not been included as high level objectives. For more information go to the section 1.7 'Assessing impacts on economic growth and employment opportunities'.

We have not included an objective to minimise risks to human health associated with primary or secondary contact recreation in lakes. This is because our monitoring suggests that microbiological water quality in lakes is of a high standard and consequently risks to human health are low.

4.4.6 Evaluating the management options

The following tables provide an assessment of the management options with respect to the high level objectives.

Water quality objectives options for shallow lakes (based on a typical shallow dune lake).

High level objective	Measure	Option A: eutrophic state (Chl-a = "C" attribute, TP = "B" attribute, TN = "C" attribute)	Option B: mesotrophic state (Chl-a = "B" attribute, TP = "B" attribute, TN = "B" attribute)
Maximise the ecological integrity of Northland's lakes.	Macrophyte depth (m).	~3-5m	~4-5m
	Visual clarity (m).	~2m	~2-3m
	Macroinvertebrate diversity (relative species diversity).	Lower	Higher

50 *Ibid.*

High level objective	Measure	Option A: eutrophic state (Chl-a = "C" attribute, TP = "B" attribute, TN = "C" attribute)	Option B: mesotrophic state (Chl-a = "B" attribute, TP = "B" attribute, TN = "B" attribute)
Minimise costs to resource users and/or the council.	Level of intervention (mitigation and/or remediation actions) required to achieve the desired management option (low cost, moderate costs, high costs, substantial costs).	Low costs	Substantial costs

Water quality objectives options for deep lakes (based on typical deep dune lake).

High level objective	Measure	Option A: mesotrophic state (Chl-a = "B" attribute, TP = "A" attribute, TN = "B" attribute)	Option B: oligotrophic state (Chl-a = "A" attribute, TP = "A" attribute, TN = "A" attribute)
Maximise the ecological integrity of Northland's lakes.	Macrophyte depth (m).	~7-10m	~10-22m
	Visual clarity (m).	~4-10m	~5-11m
	Macroinvertebrate diversity (relative species diversity).	No significant change	No significant change
Minimise costs to resource users and/or the community.	Level of intervention (mitigation and/or remediation actions) required to achieve the desired management option (low cost, moderate costs, high costs, substantial costs).	Moderate costs	Substantial costs

Certainty about the evaluation

This evaluation is characterised by uncertainty particularly in relation to:

- *The relationships between nutrients and plant, algae and other aquatic species*: while statistical relationships between nutrients and ecological states across multiple lakes have been determined, the analysis found that there were varying degrees of fit for individual lakes. Therefore, it is almost certain that some lakes will not respond in the exact manner as predicted by the nutrient concentration should it change over time as a result of a management action.[51] This evaluation is based on generalised relationships between all of the monitored lakes in Northland. It also does not address the sensitivities of different plant, algal and zooplankton species (native and exotic) to nutrient concentrations.
- *The feasibility of achieving lake water quality objectives with good management practices and stock exclusion, and for more aspirational objectives, advanced mitigations and land use changes*: this relates to a lack of good understanding about nutrient loads and transport pathways to lakes, including the role of underlying aquifers, and the role of other pressures, such as pest plants and animals. For example, exotic fish can promote phytoplankton growth by recycling nutrients and controlling the development of zooplankton that could otherwise help clear the water of algae. Another

51 *See Kelly D. J., Peacock L., Jiang W., 2016. Nutrient management for Northland's dune lakes. Prepared for Northland Regional Council. Cawthron Report No. 2796 for details on the limitation of the research.*

example is that bottom-feeding fish, such as koi carp or catfish, can stir up sediment and decrease water clarity potentially compromising macrophyte growth and presence.[52]

Nevertheless, we have endeavoured to use the best available information to make recommendations on appropriate water quality objectives for Northland's lakes. Consistent with an adaptive management approach, objectives set in the plan will be reviewed and revised over time.

Time-frame of the evaluation

Achieving water quality objectives can take a long time if water quality improvements are required. With regard to the lake water quality objective options identified in this report, some lakes will take a long time to respond to mitigations and others less so. As such, the time-frame of this evaluation should be viewed in decades not years. More research is required to determine time-frames associated with achieving lake water quality objectives.

The preferred management option

The preferred management approach for shallow and deep lakes is Option A. Northland's lakes, and dune lakes in particular, are internationally and nationally important ecosystems and require careful management. A number of the lakes are in a degraded state, several of which are below national bottom lines, and there is strong national and regional policy direction to improve the overall quality of Northland's lakes.

We consider that this should be achieved by setting lake water quality objectives (standards) that provide for a eutrophic state in shallow lakes and a mesotrophic state in deep lakes. The main ways to achieve these objectives and protect water quality are likely to be excluding livestock from the margins and connected surface water bodies of lakes, good management practices on farms and in plantation forestry activities, including by way of ongoing non-regulatory extension and support from council and industry groups, and strong controls on point source discharges in lake catchments. These actions will be augmented by the development and implementation of lake-specific management plans, which is being led by the council's land management department.

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52 *Doole G., Marsh D., 2015. Conceptual modelling of shallow dune lakes in the Northland region of New Zealand. Draft Report. Prepared for Ministry for Primary Industries, Ministry for the Environment and Northland Regional Council.*

4.5 Coastal water quality standards

4.5.1 Executive summary

Similar to freshwater quality objectives, coastal water quality standards provide for the protection of water quality dependent values and uses or coastal waters (for example, aquatic ecosystems, swimming, shellfish consumption) by specifying maximum or minimum concentrations of relevant chemical, physical, or microbiological characteristics (or, attributes) that support the values.

Section 69 of the RMA provides for, but does not require, the setting of coastal water quality standards in regional plans. Councils have the option of using mostly narrative standards in Schedule 3 of the RMA or developing their own standards. The Regional Coastal Plan for Northland contains a combination of RMA Schedule 3 standards and tailored (that is, specific) standards for the Bay of Islands and the Whangārei Harbour. Some of the standards are out-of-date or not relevant to the management of Northland's coastal waters. The council is proposing to include revised (that is, updated and more relevant) coastal water quality standards in the new regional plan. In summary, they seek to maintain the good quality of Northland's coastal waters for the purposes of safeguarding the health of aquatic ecosystems and minimise human health risks associated with contract recreation and shellfish consumption.

The alternative options, not to include coastal water quality standards in the new plan or include them as guidelines, is not recommended on the grounds that standards provide clarity and therefore certainty about what values water quality is to be managed for and the level of protection afforded to the values.

4.5.2 Relevant provisions

This evaluation supports the following Regional Plan provisions:

- Policy D.4.3 - Coastal water quality standards
- Policy D.4.4 - Coastal sediment quality standards

4.5.3 The problem, opportunity and/or requirement

Water quality standards are implemented primarily through controls on point source discharges (for example, wastewater treatment plants), but also can be used to manage diffuse discharges in contributing catchments and to report on water quality (for example, state of the environment reports).

Section 69 of the RMA provides for, but does not require, the setting of coastal water quality standards in regional plans. Councils have the option of using mostly narrative standards in Schedule 3 of the RMA or developing their own standards. The Regional Coastal Plan for Northland contains a combination of RMA Schedule 3 standards (for most coastal waters) and specific standards (for the Bay of Islands and Whangārei Harbour). There are three main issues with these standards:

1) The RMA Schedule 3 standards are mostly narrative, and therefore open to interpretation;
2) Some are now out of date as knowledge on the relationships between some contaminants and water quality dependent values have improved; and
3) The nutrient standards (derived from the ANZECC guidelines) are too conservative for New Zealand waters.

We need to determine whether to include coastal water quality standards in the new regional plan, and if so whether to use the current standards or include new or amended standards.

4.5.4 Management options

The options to resolve the issues with the current coastal water quality standards are summarised as follows.

Option A: do not include coastal water quality standards in the plan

The first option is to not include any coastal water quality standards in the new regional plan. As mentioned previously, the RMA does not require councils to include them in plans. Under this option, coastal water quality standards or discharge quality standards would be determined on a case-by-case basis when considering applications for resource consents to discharge contaminants into coastal water.

Option B: include revised standards in the plan

This option involves including revised coastal water quality standards in the new regional plan. The suggested standards in this option are set out in a draft Northland Regional Council report[53], and are a combination of:

- Default trigger values in the ANZECC Guidelines 2000[54] for toxicants and other stressors (dissolved oxygen, temperature, pH);
- Standards for nutrients, chlorophyll-a, and water clarity derived from Northland-specific coastal water quality data in accordance with the recommended approach in the ANZECC 2000 Guidelines;
- Water quality criteria for faecal indicator bacteria in Ministry for the Environment's microbiological water quality guidelines for marine and freshwater recreational areas;[55] and
- Benthic sediment quality guidelines, based on the ANZECC 2000 Guidelines and the Canadian Environmental Quality Guidelines.

In summary, they seek to maintain the quality of water in Northland's water bodies for the purposes of safeguarding the health (integrity) of aquatic ecosystems, and human health associated with contact recreation and shellfish consumption. More specifically, the standards provide for:

- A high species protection level for aquatic species with respect to heavy metals and other toxicants dissolved in water and within benthic sediment; and
- The maintenance of the trophic states of Northland's estuarine and coastal waters; and
- A low level of risks to human health associated with contact recreation and human health.

Option C: include coastal water quality guidelines in the plan

The third option is to adopt the standards in Option B but include them as coastal water quality guidelines in the new plan. That is, they would assist applicants for coastal permits and decision-makers with determining appropriate treatment quality standards. However they would have not have regulatory force; they would simply be guidelines. The Regional Water and Soil Plan contains freshwater quality guidelines.

4.5.5 High level objectives and measures

Section 32 requires an assessment of "*...the efficiency and effectiveness of the provisions in achieving the objectives...*". Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section "Evaluation approach" for more details.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. Measures make the high level objectives specific and they are a metric for the high level objective and are used to test the management options against.

53 *Northland Regional Council, 2016. Recommended coastal water quality standards for Northland. Draft unpublished report.*

54 *Australian and New Zealand Environment and Conservation Council, Agriculture and Resource Management Council.*

55 *Ministry for the Environment, 2003. Microbiological Water Quality Guidelines for Marine and Freshwater Recreational Areas.*

High level objective	Measure
Maximise certainty about desired environmental outcomes (that is, protection of water quality dependent values).	Level of certainty: none, low, moderate, high.
Minimise costs to people who currently discharge contaminants into coastal waters.	Level of new intervention required to achieve coastal water quality standards: low cost, moderate costs, high costs, substantial costs.

Explanation for the high level objectives and measures

Maximise certainty for desired environmental outcomes

A key purpose of the RMA, the New Zealand Coastal Policy Statement 2010, and water quality management in general is to safeguard the health of aquatic ecosystems and people. Coastal water quality standards provide clarity and therefore certainty about the level of protection afforded to water quality dependent uses and values (or "values" for short). However, not including coastal water quality standards in plans does not mean values will not be protected. Rather, it will happen on a case-by-case and potentially inconsistent way. We have used a constructed measure to assess the likely level of certainty.

Minimise costs to resource users

The second objective is to minimise costs to people who discharge contaminants into coastal waters. In this context, costs relate to measures to avoid, remedy, or mitigate adverse effects of discharges. Again, we have used a constructed measure for it is very difficult to quantity the actual costs. It is also useful to not that coastal water quality standards clearly define the tolerable degree of contamination and in doing so provide clarity and certainty to current and potential resource users about available resource use, for example the standard that wastewater needs to be treated to. We have used a narrative constructed measure to assess clarity.

High level objectives not included

Section 32 requires an assessment of the impacts on economic growth and employment opportunities (s32(2)(a)). However, the impact of the management options on economic growth and employment opportunities cannot be determined with any confidence. Therefore, economic growth and employment opportunities have not been included as high level objectives. For more information go section 1.7 'Assessing impacts on economic growth and employment opportunities'.

4.5.6 Evaluating the management options

The following table summarises the likely consequences of the three management options with respect to the high level objectives

High level objective	Measure	Option A: do not include coastal water quality standards in the plan	Option B: include revised coastal water quality standards in plan	Option C: include coastal water quality guidelines in the plan
Maximise certainty that desired water quality related outcomes will be achieved (that is, protection of water quality	Level of certainty: none, low, moderate, high	Moderate	High	Moderate

High level objective	Measure	Option A: do not include coastal water quality standards in the plan	Option B: include revised coastal water quality standards in plan	Option C: include coastal water quality guidelines in the plan
dependent values)				
Minimise new costs to people who currently discharge contaminants into coastal water	Level of new intervention required to achieve coastal water quality standards: no costs, low cost, moderate costs, high costs, substantial costs, unknown	Unknown costs (resource consent applications processed on a case-by-case basis)	Low - no new costs	Low - no new costs

Certainty about the evaluation

We are reasonably confident that the evaluation is accurate enough to make a decision on the preferred option.

Time-frame of the evaluation

The evaluation applies to the life-time of the new regional plan (10-15 years).

The preferred management option

We consider that Option B (include revised coastal water quality standards in the new plan) is the most appropriate option on the grounds that it provides more certainty and clarity about the values that water quality will be managed for and the level of protection afforded to the values relative to the other options. The recommended standards will also provide a robust approach to assessing and issuing resource consents for discharges of contaminants to coastal waters and improve reporting on coastal water quality in state of the environment reports.

The proposed coastal water quality standards are unlikely to impact on people who currently discharge contaminants into the environment. This is because they provide for the maintenance, not enhancement, of the quality of Northland's coastal water quality.

4.6 Wastewater discharges from public and on-site treatment systems

4.6.1 Executive summary

Wastewater is liquid waste from domestic and commercial sources (sewage and industrial and trade wastes). The Regional Water and Soil Plan and Regional Coastal Plan contain rules for discharges of wastewater from municipal wastewater treatment plants, reticulation networks, and domestic on-site treatment systems. On the whole, the rules and associated policies are robust and do not require any major changes.

However, there is justification for simplifying the rules for discharges from on-site domestic wastewater systems and updating them so that they reference the current Australia/New Zealand Standard for on-site domestic wastewater systems[56]. We are also proposing to largely retain the rules for discharges (overflows) from municipal wastewater networks and wastewater treatment plants. The main proposed changes include a requirement, in the controlled activity rule for wastewater overflows, that network management plans are developed for networks and applications for resource consents must be received within two years of the operative date of the plan. Failure to comply with the conditions of the controlled activity rule means that the activity would become a discretionary activity.

4.6.2 Relevant provisions

This evaluation supports the following Regional Plan provisions:

- Policy D.4.7 - Discharging wastewater to land
- Rules C.6.2.1 - C.6.2.4 - Wastewater network and treatment plant discharges

4.6.3 The problem, opportunity and/or requirement

Wastewater refers to liquid waste from domestic (sewage) and commercial sources (industrial and trade wastes). In most urban areas wastewater is reticulated to wastewater treatment plants, although in areas where there is no access to wastewater treatment plants, it is treated in on-site domestic wastewater systems (septic systems).

The Regional Water and Soil Plan and Regional Coastal Plan contain rules for discharges of wastewater from wastewater treatment plants, reticulation networks, and on-site systems. On the whole, the rules and associated policies are robust and do not require any major changes.[57]

Despite the rules the majority of discharges (wet weather overflows) from wastewater reticulation networks in Northland remain unauthorised. That is, they are not permitted by a rule in the operative plans or by resource consents. Overflows are common to wastewater reticulation networks and are caused by a range of factors including blockages in pipes, pump station failures and inadequate pipe capacity. The major factor causing overflows is stormwater infiltration and inflow into the network during wet weather. Wet weather discharges from manholes and pump stations normally have a large stormwater component, which significantly dilutes the wastewater. Overflows can be a source of faecal pathogens in receiving environments and pose risks to human health, which can, in turn, affect public access to water for swimming, recreational shellfish collection, and commercial oyster farming.

56 *Australia/New Zealand Standard (AS/NZS) 1547:2012, "On-site domestic-wastewater management".*

57 *See Regional Plans Review – Water Quality, 2014. Northland Regional Council.*

While this is true, we are not aware of any significant environmental issues associated with wastewater overflows that are currently occurring in Northland. Most happen during heavy rain events when receiving waters are not used for recreation. However, we cannot dismiss risks to human health associated with consuming shellfish from estuarine areas that are affected by overflows from wastewater networks. Untreated discharges of wastewater to water are also considered by many people to be socially and culturally unacceptable.

Lastly, while the rules for discharges from on-site septic systems are generally robust, there is justification to simplify and bring them in line with current New Zealand design standards. (The current rules require on-site septic systems to be designed in accordance with the principles and procedures outlines in the Australia/New Zealand Standard (AS/NZS) 1547:2000 "On-site domestic-wastewater management". This has been superseded by AS/NZS 1547:2012.

4.6.4 Management options

Overflows from reticulation networks

Option A: revise existing controlled activity rule for wastewater overflows

This option involves retaining a controlled activity rule for wastewater overflows, subject to conditions. Conditions would largely include the existing conditions, albeit with lower dry weather storage requirements, and (a) district councils having two years from the operative date of the rule to apply for resource consents for discharges, and (b) wastewater network management plans would be required as part of the applications. The change required storage capacity for pump stations from a minimum of 12 hours (based on the average dry weather flow) to four hours is because the former is unnecessarily restrictive and not consistent with the approach taken in other regions (for example, Auckland).

The activity would be a discretionary activity if the conditions are not met.

Option B: permit wastewater overflows

This option involves permitting wastewater overflows to water and to land where they may enter water, subject to conditions on network design including the design standards for pipes and pump stations (such as minimum pipe sizes) in order to prevent or limit the the frequency, duration and magnitude of discharges. A wastewater overflow that is not permitted by the rule would be a controlled or discretionary activity.

It is worth noting that this is similar to the approach in the Auckland Unitary Plan with regards to discharges for untreated wastewater overflows from new wastewater networks. Auckland Council has specified network design standards (for example, the pipe must have a capacity for at least five times the average dry weather flow).

Option C: discretionary activity

This option involves changing the status of wastewater overflows from a controlled to a discretionary activity, which means that the council has the discretion to decline or grant applications for resource consents and include conditions on the resource consents.

Note that we have not included prohibiting wastewater overflows as an option because of the exceptionally high (that is, unaffordable) costs to communities.

Discharges from on-site domestic wastewater systems and from wastewater treatment plants

The council is not aware of any significant issues with the current rules for discharges from on-site domestic wastewater systems and municipal wastewater treatment plants. However, there is a case for simplifying the rules for on-site domestic wastewater systems, bringing them in line with current New Zealand design standards, and providing clear criteria for setbacks from sensitive areas. The proposed changes are unlikely to be contentious as they will not result in any additional costs to property owners with such systems. That is, the proposed minor changes are likely to have minimal effect on resource users.

4.6.5 High level objectives and measures

Section 32 of the RMA requires the council to assess the efficiency and effectiveness (i.e. the appropriateness) of proposed provisions. We have done does this by assessing the management options against a set of high level objectives and measures. Refer to the section "Evaluation approach" for more details.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. Measures make the high level objectives specific and they are a metric for testing and comparing management options. The following table sets out high level objectives and associated measures for assessing options for managing wastewater overflows from reticulation networks.

High level objective	Measure
Minimise risks to human health (popular swimming sites, shellfish growing and gathering areas).	The ability of the council to control the activity so that adverse effects are avoided, remedied, or mitigated: • No control • Minor control • Moderate control • Significant control • Full control
Minimise administrative costs to district councils.	Costs associated with applying for resource consents (no cost, low, moderate, high).

Explanation for the high level objectives and measures

Minimise risks to human health

Wastewater overflows can contain faecal pathogens, which have the potential to cause risks to human health if they enter water used by people for contact recreation or shellfish harvesting. However, at a regional level it is very difficult to quantify the risks of wastewater overflows to human health. This is due to factors such as the location, volume, and frequency of the discharge. Therefore, we have used a constructed measure for risk: the ability to adequately control (that is, avoid or mitigate) the adverse effects of wastewater overflows.

Minimise administrative costs to district councils

Administrative costs refer to the costs associated with preparing and applying for resource consents. This can include the costs associated with engaging relevant stakeholders, consultants such as engineers, planners and lawyers, and hearing commissioners. It is also difficult to quantify these costs and consequently we have also used a constructed scale. Some of these costs are explained later in this report.

High level objectives not included

We have not included a high level objective relating to aquatic ecosystem health. This is because most wastewater overflows are highly diluted by stormwater and do not contain levels of ammonia or other toxicants that would cause toxic effects.

In addition, we have not included an objective to minimising compliance costs to district councils. Compliance costs refer to the costs of constructing, upgrading and maintaining wastewater networks to meet certain design standards. Wastewater networks vary considerably depending on their age, location, pipe materials, etc. It is very difficult to predict at a regional-scale what upgrades are desired by the community and the associated costs.

Lastly, section 32 of the RMA requires an assessment of the impacts on economic growth and employment opportunities (s32(2)(a)) associated with a proposed management option. However, the impact of the identified options cannot be determined with any confidence. Therefore, economic growth and employment opportunities have not been included as high level objectives. For more information go to the section 1.7 'Assessing impacts on economic growth and employment opportunities'.

4.6.6 Evaluating the management options

High level objective	Measure	Option A: controlled activity	Option B: permit overflows subject to containment standards	Option C: discretionary activity
Minimise risks to human health (popular swimming sites, shellfish growing and gathering areas).	The ability of the council to control the activity so that adverse effects are avoided, remedied, or mitigated: • No control • Minor control • Moderate control • Significant control • Full control	Moderate-significant control	Minor-moderate control	Significant control
Minimise administrative costs to district councils.	Costs associated with applying for resource consents (no cost, low, moderate, high).	Moderate costs	No costs	High costs

Certainty about the evaluation

We do not have good information on the location, frequency and volumes of all wastewater overflows in Northland, or their impacts on water quality. However, we are not aware of any evidence to suggest that they are currently causing any significant adverse effects on human health or the environment, although this could change as networks age, the climate changes or populations increase.

We also do not have a good understanding of the cost of different contaminant standards (that is, the maximum number of times per annum a network can overflow into the environment) to be imposed as a condition of a permitted activity rule, or their effectiveness in reducing the potential adverse effects of wastewater overflows.

Time-frame of the evaluation

The time-frame for this evaluation is the expected life of the new plan (10-15 years).

The preferred management option

We consider that on balance Option A is the best management option. While the council could permit wastewater overflows subject to network design standards (that is, containment standards) there is the potential for risks to human health that should be best addressed through a case-by-case assessment through a resource consenting process. We also consider that there is good justification to update and simplify the current permitted activity rules for discharges from domestic on-site wastewater systems.

4.7 Stormwater discharges

4.7.1 Executive summary

This report looks at appropriateness of the council's current rules for stormwater discharges from urban areas, roads, and other areas and identifies options to improve them. Stormwater discharges associated with land disturbance activities are addressed in the section 4.10 'Land disturbance activities'.

Stormwater can contain a range of contaminants, such fine sediment, faecal microbes, nutrients, heavy metals, hydrocarbons and other chemicals. Generally speaking, contaminant levels in stormwater are not normally high enough to cause acute adverse effects on aquatic species. The more common situation is the accumulation of contaminants in receiving waters that can cause chronic adverse effects on aquatic ecosystems. Monitoring and research suggests that stormwater from urban areas is not currently a significant pressure on aquatic ecosystems at a regional level in Northland. However it does present risks and there are some localised issues.

The Regional Water and Soil Plan and the Regional Coastal Plan contain rules for stormwater discharges. Generally speaking the rules have worked well, but there are some issues with them. They are:

1) Inconsistencies between the plans;

2) Out-of-date discharge and receiving water quality standards; and

3) Overlaps between regional and district council roles and responsibilities.

The council is proposing to address these issues by amending and simplifying the current rules for inclusion in the new regional plan.

4.7.2 Relevant provisions

This evaluation supports the following Regional Plan provisions:

- Rules C.6.4.1 - C.6.4.4 - Stormwater discharges

4.7.3 The problem, opportunity and/or requirement

Stormwater can contain a range of contaminants, such as organic and inorganic matter, heavy metals, hydrocarbons and faecal microbes. Generally speaking, contaminant levels in stormwater are not normally high enough to cause acute adverse effects on aquatic ecosystems. The more common situation is the build-up (accumulation) of persistent contaminants such as heavy metals in receiving environments, which can cause chronic adverse effects on aquatic ecosystems.

Research has revealed that heavy metal concentrations in sediments at almost all estuarine monitoring sites in Northland (the main receiving environment for urban stormwater) are below guidelines levels.[58] The Hātea River estuarine arm of the Whangārei Harbour is the only area where some heavy metals (copper and zinc) in the river bed appear to be above recommended guideline levels.[59] High sedimentation rates are an issue in many of Northland's estuaries. However, while urban environments are a source of sediment they typically contribute (that is, yield) less by unit area than rural environments.

These findings suggest that at a regional level urban stormwater is not currently a significant pressure on the health of aquatic ecosystems and people in Northland. Nonetheless, stormwater discharges still present real risks to the environment and they are a source of fine sediment - the main contaminant of concern in the region's water bodies. Some sites, such as industrial and trade premises that store, use or generate toxic contaminants (that is, hazardous substances), pose risks to the quality of stormwater if they are not appropriately managed.

58 *See 2016 State of the Environment Report for Northland. Northland Regional Council.*

59 *Table 3.5.1 "Recommended sediment quality guidelines (ISQG-Low)", Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of New Zealand, 2000. Australian and New Zealand Guidelines for fresh and marine water quality. Volume 1. (ANZECC Guidelines 2000).*

Against this background, there are three key issues with the management of stormwater discharges in Northland:

1) Inconsistencies in the current policies and rules for stormwater discharges;

2) Out-of-date discharge and receiving water quality standards; and

3) Overlaps between regional and district council roles and responsibilities.

These problems are mainly administrative in nature and are briefly discussed below.

Inconsistencies in the current policies and rules

The Regional Water and Soil Plan and the Regional Coastal Plan regulate stormwater discharges differently, with the latter being more restrictive even though in many areas stormwater discharged to streams and rivers ultimately enters the same receiving environments (estuaries and harbours).

The rules also treat individual discharges from urban networks in isolation. This is inconsistent with policy direction on comprehensive stormwater management[60] (that is, managing the cumulative effects of multiple discharges on receiving water bodies through network consents and associated stormwater management plans).

Lastly, the plans use a mix of discharge and receiving water quality standards that differ within and between the plans.[61] This has caused confusion at times.

Discharge and receiving water quality standards

The permitted activity rules for stormwater discharges in the Regional Water and Soil Plan contain discharge quality standards. These standards have been derived from technical guidelines including the now superseded 1992 Australian Water Quality Guidelines for Fresh and Marine waters.[62]

The Regional Coastal Plan does not contain discharge quality standards for stormwater. It does however contain a mix of narrative and numeric water quality standards that provide for the protection of several beneficial uses of water including aquatic ecosystems, contact recreation, and shellfish consumption.[63] The plan requires that all discharges must, after reasonable mixing, comply with the receiving water quality standards.

Overlaps between regional and district council roles and responsibilities

Flood mitigation controls

Permitted activity rule 21.1.2 in the Regional Water and Soil Plan requires that stormwater networks and systems are designed to a certain standard:

> *"(a) For new subdivision and development, the best practicable option for on-site stormwater disposal shall be identified and incorporated into the stormwater management design to avoid or minimise changes to stormwater flows after development for the 1 in 5 year return period storm event ...*
>
> *(d) The stormwater collection system is designed to cater for stormwater flows resulting from not less than a 1 in 5 year return period storm event and a stabilised overland flow path is provided for to allow flows up to and included a 1 in 50 year storm event in excess of the primary collection system ...*
>
> *(i) The diversion and/or discharge does not cause flooding of adjacent properties."*

These conditions are primarily for the purpose of ensuring that stormwater systems are constructed to mitigate risks of flooding on people and property. However, it is important to note that district councils also have statutory responsibilities with respect to flood mitigation.

60 *See Policy 8.17.3, Regional Water and Soil Plan.*

61 *For example, see permitted activity rules 21.1.2 and 22.1.3 in the Regional Water and Soil Plan.*

62 *ANZECC Guidelines 1992.*

63 *See Appendix 4 "Coastal Water Quality Standards", Regional Coastal Plan for Northland.*

Section 31 of the RMA provides district councils with the function of controlling any actual or potential effects of the use, development, or protection of land, including for the purpose of the avoidance or mitigation of natural hazards[64] (which includes flooding).

District councils are also required to provide network infrastructure (which includes stormwater networks) and avoid or mitigate natural hazards as core services under the Local Government Act 2002.[65]

Whangārei, Kaipara and Far North district councils regulate new subdivision and development through their district plans and associated engineering standards. Their standards on new stormwater systems and connections to public networks appear to be sufficiently robust for the purposes of mitigating the impacts of heavy rain events and flood control.

We think that it is more appropriate for district councils to make decisions about flood management and mitigation in their stormwater networks. However, we consider that it may be useful as a regulatory backstop to specify minimum flood mitigation standards for stormwater discharges outside of areas serviced by public stormwater networks.

Controlling high-risk sites

Permitted activity rule 21.1.2 in the Regional Water and Soil Plan includes conditions on hazardous substance storage areas and industrial and trade premises that discharge stormwater to water via stormwater collection systems (including public stormwater networks). These controls are in place to prevent and minimise hazardous substances and other contaminants entering stormwater.

However we think that it may be more appropriate for district councils to control such discharges into their stormwater networks. This is because, arguably, they are legally responsible for the quality of stormwater that is discharged from their networks. They also have statutory functions for controlling the use, development and protection of land for the purposes of:[66]

- The prevention or mitigation of any adverse effects of the storage, use, disposal, or transportation of hazardous substances; and
- The prevention of mitigation of any adverse effects of the development, subdivision, or use of contaminated land.

However, it may be prudent for the regional council to also control discharges of stormwater from high risk industrial and trade premises to public stormwater networks as a regulatory backstop. We consider that industrial or trade premises used for any of the following purposes and that have contaminants used or generated in the industriual or trade process that are exposed to rain or stormwater are high risk sites:

1) Boat construction and maintenance;
2) Port activities, including dry docks;
3) Commercial manufacture, formulation or bulk storage, recovery, processing or recycling;
4) Fertiliser manufacture or bulk storage;
5) Storage of hazardous substances including waste dumps or dam tailings associated with mining activities;
6) Petroleum or petrochemical industries including a petroleum depot, terminal, blending plant or refinery, or facilities for recovery, reprocessing or recycling petroleum-based materials;
7) Scrap yards including automotive dismantling, wrecking or scrap metal yards; and
8) Wood treatment, preservation (including the commercial use of antisaptain chemicals) or bulk storage of treated timber.

The sites were determined by expert opinion and are a selection of activities from the Hazardous Activities and Industries List[67].

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64 *The RMA defines natural hazards as "any atmospheric or earth or water related occurrence (including earthquake, tsunami, erosion, volcanic and geothermal activity, landslip, subsidence, sedimentation, wind, drought, fire, or flooding) the action of which adversely affects or may adversely affect human life, property, or other aspects of the environment.*

65 *See Local Government Act 2002, s11A(a) and (d), in particular.*

66 *See RMA s30(1)(b)(ii) and (iia).*

67 *See http://www.mfe.govt.nz/land/hazardous-activities-and-industries-list-hail*

4.7.4 Management options

Public stormwater networks

Option A: permit discharges from public stormwater networks subject to amended conditions

This option involves retaining a permitted activity status for stormwater discharges from public stormwater networks, subject to amended conditions including updated receiving water quality standards and the requirement for stormwater management plans for priority networks to be provided to the council within two years of the operative date of the rule. The suggested priority public stormwater networks are based on their large size and amount of industrial and trade activities relative to other networks in Northland, and are as follows: Kaitaia, Kaikohe, Kerikeri, Paihia, Waipapa, One Tree Point-Marsden Cover, Ruakaka, Waipu, Whangarei City, Dargaville, Mangawhai-Mangawhai Heads.

Option B: controlled or restricted discretionary activity rule for stormwater discharges from urban networks

This option involves regulating stormwater discharges from public stormwater networks under a controlled or discretionary activity rule. The proposed matters of control or discretion in this option are:

- The design of the stormwater network;
- Methods to avoid and mitigate adverse effects on aquatic ecosystems, including maximum contaminant concentrations or loads in the discharge; and
- Methods to mitigate flooding outside of areas serviced by stormwater networks.

High risk sites

Option A: permit stormwater discharges from high-risk sites

The first option is to permit stormwater discharges from high risk sites subject to conditions, including the requirements for oil and grease interceptors, and discharge and receiving water quality standards.

Option B: controlled or restricted activity rule for stormwater discharges from high risk sites

The second option is to classify stormwater discharges from these sites as a controlled or restricted discretionary activity. The proposed matters of control or discretion in this option are:

- Methods to avoid and mitigate adverse effects on aquatic ecosystems, including maximum contaminant concentrations or loads in the discharge; and
- The design and operation of the stormwater collection system.

Other stormwater discharges

Option A: permit stormwater discharges from other sites

This option involves permitting stormwater discharges from other sites subject to conditions, including receiving water quality standards and other standard conditions.

Option B: controlled activity rule for discharges from other sources

The other option is to classify stormwater discharges from other sites as a controlled activity.

4.7.5 High level objectives and measures

Section 32 of the RMA requires an assessment of "*...the efficiency and effectiveness of the provisions in achieving the objectives...*". Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section 1.6 'Evaluation approach' for more details.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against.

High level objective	Measure
Minimise risks to the health of aquatic ecosystems.	The ability of the council to control the activity so that adverse effects are avoided, remedied, or mitigated: • No control • Minor control • Moderate control • Significant control • Full control
Minimise administrative costs	Costs associated with applying for resource consents ($).

Explanation for the high level objectives and measures

Minimise risks to the health of aquatic ecosystems

Our monitoring and research suggests that stormwater discharges are not causing significant adverse effects on aquatic ecosystems. However, that does not mean that stormwater is not a risk. We have used a constructed measure to assess the effectiveness of the management option to minimise adverse effects on aquatic ecosystems.

Minimise administrative costs

Administrative costs refer to the costs of applying for a resource consent and any associated monitoring fees. Compliance costs (that is, the costs of complying with the rules or conditions of resource consents) are considered separately below.

The costs of applying for resource consents include the time and resources needed to prepare the application including any associated legal and science input, the transaction costs ($3150 for a notified application and $840 for a non-notified application), and any costs for hearing commissioners, and appeals. The exact cost will vary depending on the network and the number of affected parties. Costs can be large (that is, tens of thousands of dollars) for applications for resource consents to authorise discharges from public stormwater networks.

High level objectives not included

We have not included an objective of minimising compliance costs. Compliance costs refer to the costs of complying with rules and conditions or resource consents (for example, constructing and upgrading stormwater systems).

It is difficult to quantify the costs of complying with the management options because stormwater systems vary in a number of ways (for example, urban population size, age of network, receiving environment). Besides, the ability of communities to fund capital works also varies.

Lastly, section 32 of the RMA requires an assessment of the impacts of the management options on economic growth and employment opportunities. However, the impact of the options on these is likely to be insignificant and cannot be determined with any confidence. See the section 1.7 'Assessing impacts on economic growth and employment opportunities' for more information.

4.7.6 Evaluating the management options

Stormwater discharges from public networks

High level objective	Measure	Option A: permit subject to amended conditions	Option B: control activity or restricted discretionary activity
Minimise risks to the health of aquatic ecosystems	The ability of the council to control the activity so that adverse effects are avoided, remedied, or mitigated: • No control • Minor control • Moderate control • Significant control • Full control	Moderate control	Significant control
Minimise administrative costs to a discharger	Costs associated with applying for resource consents ($), which includes a network management plan.	$0	Small network = approx. $25,000; Medium sized network = approx. $50,000 - 100,000; Large network = approx. $100,000 plus

Stormwater discharges from high-risk sites

High level objective	Measure	Option A: permitted activity	Option B: controlled or restricted discretionary activity
Minimise risks to the health of aquatic ecosystems	The ability of the council to control the activity so that adverse effects are avoided, remedied, or mitigated: • No control • Minor control • Moderate control • Significant control • Full control	Minor-moderate control	Significant control
Minimise administrative costs to a discharger	Costs associated with applying for resource consents ($)	$0	$858 (non-notified application) $3,217 (notified & limited notified)

Other stormwater discharges

High level objective	Measure	Option A: permitted activity	Option B: controlled activity rule
Minimise risks to the health of aquatic ecosystems	The ability of the council to control the activity so that adverse effects are avoided, remedied, or mitigated: • No control • Minor control • Moderate control • Significant control • Full control	Moderate-significant control	Significant control
Minimise costs to a discharger	Costs associated with applying for resource consents ($)	$0	$858 (non-notified application) $3,217 (notified & limited notified)

Certainty about the evaluation

The main uncertainty in this evaluation is around the need to regulate stormwater attenuation within public stormwater networks for flood mitigation purposes and regulate discharges of stormwater from high-risk sites to public stormwater networks. There may be a need for additional regional control to ensure that systems are designed appropriately and high-risk sites are adequately managed but we have not identified this as an option.

Time-frame of the evaluation

The time-frame for this evaluation is the expected life of the new plan (10-15 years).

The preferred management options

We consider that discharges from stormwater networks should continue to be a permitted activity subject to conditions. The reason being we are not aware of any significant water quality related issues associated with urban stormwater discharges and the amended permitted activity conditions should minimise the risk of adverse effects on the environment. In particular, the requirement for stormwater management plans for priority public networks should assist with reducing risks. It is also important to consider the likely significant costs of preparing and considering applications for resource consents to authorise discharges from public stormwater neworks with respect to what the consent process will achieve.

However, we think that stormwater discharges from high risk industrial and trade premises should be controlled by resource consents. This is because they pose greater risks to water quality than stormwater from other premises and areas. In addition, they are best addressed on a case-by-case basis because it is difficult to specify catch-all conditions in a permitted activity rule.

Lastly, we consider that it is also appropriate to continue to permit, subject to conditions, discharges from other impervious areasand stormwater collection systems.

4.8 Farm wastewater discharges

4.8.1 Executive summary

Wastewater, including animal effluent, from farm dairy sheds and other areas such as stock yards, feeedpads, standoff pads piggeries and other point sources can contain high levels of organic matter, nutrients and faecal microbes, which, if discharged into water, can cause significant adverse effects on aquatic ecosystems and human health.

Effective disposal of farm wastewater can be challenging on many farms in Northland due to:

- Rolling to steep contour;
- Poorly drained soils which are saturated for up to five months during winter and spring;
- Highly compacted soils;
- High water tables:
- High loads from stock being stood off on pads, yards and stock races for long periods during winter and spring;
- Excessive volumes of water used for cleaning at the dairy and yards;
- A significant increase in the number of farms milking through winter;
- A lack of, or poor management of, contingency storage; and
- Stormwater entering storage and treatment ponds

The Regional Water and Soil Plan contains rules for discharges of point source animal effluent and farm wastewater. [68] Overall, the rule framework is reasonably robust and compliance with the permitted activity rule and the conditions of resource consents has steadily improved over the last ten years. However despite this, rates of significant non-compliance on dairy farms that have opted to only operate under the permitted activity rule (that is, are required to discharge all effluent to land) are much higher than consented farms. The average rates over the last five years (2011-2016) are 14% on consented farms and 25% on unconsented farms.

Unauthorised discharges of effluent to water are the main reason for non-compliance on the farms that operate under the permitted activity rule. Other reasons include excessive ponding, overland flow, discharges from irrigators into setback distances, and inadequate management. Most non complying activities result from pond overflows or application to land when soils are at or near saturation.

We assessed three management options for addressing the issues:

1) Retain the existing permitted activity rule for discharges to land;

2) Amend and strengthen the rule; and

3) Classify discharges to land as a controlled activity.

On balance, we consider that it is appropriate to retain the existing rule framework but to amend the permitted activity rule by clearly specifying the nature of the contingency measures which will help improve compliance and achieve the required environmental outcomes, which are as follows:

1) A specific minimum contingency storage volume based on each individual farming system so that all wastewater generated between 1 May and 30 September can be retained in storage ponds (for years when there is insufficient moisture deficit across the period);

2) Ponds must be empty or near empty prior to winter (1 May); and

3) Stormwater from the yard (when it is clean), buildings and pond catchments is diverted away from the wastewater stream.

This is likely to be the best option to reduce unauthorised discharges to water and to address other non-compliance issues with the current permitted activity rule at the least administrative costs to farmers and the council.

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68 *Discharging farm wastewater to land is a permitted activity subject to conditions, discharging treated farm wastewater to water is a discretionary activity, and discharging untreated farm wastewater to water is a prohibited activity.*

4.8.2 Relevant provisions

This evaluation supports the following Regional Plan provisions:

- Rules C.6.3.1 - C.3.6.7 Agricultural waste discharges
- Policy D.4.7 - Wastewater discharges to water

4.8.3 The problem, opportunity and/or requirement

Wastewater from farm dairies and other point sources mainly consists of faeces, urine, and wash-down water. However, it can also contain sediment, milk, detergents, and other residues associated with farming practices.

Poorly treated and untreated discharges of farm wastewater to water are a risk to the health of aquatic ecosystems and people. In particular, they can cause the following adverse effects in receiving water bodies:

- High ammonia concentrations, which can be toxic to aquatic animals at high levels;
- High nutrient loadings that can result in increased algal blooms, excessive aquatic plant growth, and decreased oxygen concentrations caused by excessive biological activity (plants, algae, bacteria);
- Reduced dissolved oxygen levels; and
- Faecal contamination of water, which can cause water to be unsuitable for contact recreation, stock drinking, and shellfish harvesting in downstream waters.

Monitoring and research has revealed that ammonia and *E.coli* levels are elevated across much of Northland's river network, particularly in lowland areas, and that livestock are the main source of these contaminants.[69] Pathways by which animal effluent enters water include the access of livestock to water, runoff and leaching from land, and point-source discharges.

The Regional Water and Soil Plan regulates discharges of animal effluent (and other farm wastewater[70]) from animals kept in captivity. Rule 16.1 of the Regional Water and Soil Plan permits the discharge of animal effluent to land subject to conditions, including that there is no discharge directly into surface or groundwater or into surface water via overland flow.[71]

Discharges of treated animal effluent that do not meet the conditions of the permitted activity rule are a discretionary activity[72]. Discharges of untreated animal effluent directly to water are a prohibited activity[73].

Dairy farms are responsible for almost all point source discharges of animal effluent. When this report was written (July 2017) there were approximately 900 active dairy farms in Northland. Of these:

- 670 (approximately 74%) have resource consents that permit the discharge of treated animal effluent direct to water subject to conditions; and
- 230 (approximately 26%) have opted to only discharge effluent to land pursuant to permitted activity rule 16.1, which only allows the discharge of wastewater to land.

Of the 670 farms with resource consents to discharge treated effluent to water, 470 (approximately 70%) farms also have land application systems. These farms must also comply with permitted activity rule 16.1 when discharging effluent to land.

Many of the resource consents that allow discharges of treated effluent to water were issued with conditions requiring upgrades of their systems. Conditions imposed included the provision of minimum recommended storage volumes, the installation of land application systems, effective diversion of stormwater from buildings, yards and pond catchments.

69 *See Northland Regional Council, State of the Environment Report for Northland. 2016.*

70 *Farm wastewater is defined as "all waste water and solid matter leaving a farm dairy, dairy yard, feed pad, standoff area, stock yard, sale yard, holding yard, wintering barn, loafing pad, calf rearing barn, piggery, poultry farm, adjacent entrance and exist races, farm transit races when used for standoff, stock underpass or similar, including animal effluent, washdown water, pit washings, sediment, milk, milk residue, supplementary feed, molasses, detergents, soil, sterilising agents and other residues associated with routine farming practices."*

71 *Under the RMA if an activity is described in a plan as a permitted activity, a resource consent is not required for the activity if it complies with the requirements, conditions, and permissions, if any, specified in the plan.*

72 *rule 16.3*

73 *rule 16.5.2*

Conditions also included that storage/treatment ponds must be emptied prior to winter each year and that discharges to water can only occur when conditions are too wet for the effluent to be applied to land effectively. That is, when soils were at or near saturation (insufficient soil moisture deficit).

When the disposal systems on these farms are managed adequately, discharges to water should only occur for short periods during late winter and spring or during extreme weather events. Council has encouraged the installation of land application systems and more farms that are discharging treated effluent to water (subject to resource consent conditions) have committed to installing land application systems within the next two years.

As stated previously, compliance with the permitted activity rule 16.1 and resource consent conditions has progressively improved over the last 10 years there remains a higher level of significant non-compliance on dairy farms which operate under the permitted activity rule. Table 1 below compares the average rates significant non-compliance for dairy farms that are operating with resource consents with those which operate under Rule 16.1.

Table 1: farm dairy effluent compliance statistics for the last five years for consented and unconsented farms.

	consented farms	unconsented farms
Significant non-compliance	13.8%	24.9%

Levels of significant non-compliance are much higher on the 26% of farms that have opted to only operate under the permitted activity rule. Discharge to water are the main reason for non-compliance on the unconsented farms. Water quality test results from these discharges indicate that they are likely to be adversely affecting receiving water quality. The higher rates of significant non-compliance on non-consented farms are not surprising because many of these farms are forced to irrigate to saturated soils or water due to a lack of adequate pond storage. Secondary (less common) reasons include excessive ponding, overland flow, discharges from irrigators into setback distances and inadequate management.

Consented farms are required to have adequate contingency measures, including adequate storage for effluent, which were determined for each farm during the consenting process. Consequently, they are considered to be much less of a risk to water quality than the non-consented farms.

Three key factors explain the reasons for non-compliance:

1) Excessive effluent volumes;
2) Lack of adequate contingency storage; and
3) Poor management.

These are briefly explained below.

Excessive volumes

Excessive effluent volumes are generated because of:

- The use of too much water at the dairy;
- Rainwater from buildings, yards, pads, etc. entering storage facilities (for example, ponds); and
- Stormwater from catchment areas around the ponds entering the ponds.

Wastewater volumes can be reduced by preventing stormwater from roofs, hardstands, and other areas from entering storage facilities. The current permitted activity rule does not require these actions.

There are economic incentives to decrease effluent volumes by reducing water use at the dairy and excluding stormwater from storage facilities. These include reductions in:

- Capital expenditure for constructing storage facilities;
- Capital expenditure for constructing land application systems;
- Pumping costs for water reticulation;
- Pumping costs for land application of effluent;

- Maintenance costs on pumps and irrigators; and
- Labour costs for irrigator management.

There will also be benefits in terms of more water being available for other resource users and improvements in water quality.

Lack of contingency storage

A lack of contingency storage forces farmers to irrigate to land in conditions that result in runoff and adverse effects on water quality. Sufficient contingency storage eliminates the need to irrigate during winter months when there is insufficient soil moisture deficit. It also removes a large amount of pressure on farm managers and staff. Consequently, the risk of non-compliance and adverse impacts on water quality are significantly reduced. The main problem with the current permitted activity rule is that it does not define what constitutes 'adequate contingency storage' or other good management practices.

Management of contingency storage

The full volume of contingency storage is only available if storage facilities are empty prior to winter. One of the reasons for unauthorised discharges in Northland is that storage facilities are not empty prior to winter. The current permitted activity does not require that storage facilities are emptied prior to winter.

Lastly, it is important to note that we are not proposing any significant changes to the current rules for discharges of treated farm wastewater to water (discretionary activity) or untreated discharges to water (prohibited activity). We consider that these rules are appropriate for mitigating adverse effects on water quality.

4.8.4 Management options

This section identifies options to improve the management of farm wastewater discharges to land in Northland.

Option A: retain existing rules (status quo)

The first option is to retain the existing permitted activity rule for discharging farm wastewater to land.

Option B: retain the permitted status for discharges to land, but amend the conditions of the rule

This option involves retaining a permitted activity status for discharges of farm wastewater to land, but clearly specifying in the conditions of the rule the nature of the contingency measures to prevent to water, including:

- Minimum contingency storage to hold effluent volumes generated in May through September, because in some years there is insufficient soil moisture deficit during this period;
- Ponds must be near empty prior to winter (1 May); and
- Diverting stormwater generated in dairy yards away from the effluent system when they are not being used.

Option C: control discharges to land by way of resource consents

This option involves retaining a permitted activity rule for discharges of farm wastewater to land, but making it only applicable to farms that currently hold resource consents to discharge treated effluent to water. A new controlled activity rule would be included in the plan that is specific to the discharge of animal effluent to land where resource consent is not held to discharge to water.

Under a controlled activity rule, the council must grant resource consents for animal effluent discharges to land but can exercise control matters over which control is reserved in the plan. The matters of control in this option would be:

- The design, construction, operation and maintenance of the effluent storage and treatment system;
- The location and size of the effluent disposal area;
- Contingency measures, including for events of mechanical failure and prolonged wet weather; and
- A system reassessment if farm management changes, for example, an increase in cow numbers, a change to winter milking, or the addition of infrastructure such as feed pads.

4.8.5 High level objectives and measures

Section 32 of the RMA requires an assessment of "...the efficiency and effectiveness of the provisions in achieving the objectives...". Our evaluation approach does this by assessing the management options against a set of high level objectives and measures.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against.

High level objective	Measure
Minimise: • Risks to the health of humans and livestock associated with contact with or ingestion of freshwater (reduction in faecal pathogen loads) • Adverse effects on aquatic ecosystems (reduction in ammonia and organic loads)	The ability of the council to control the activity so that adverse effects are avoided, remedied, or mitigated: • No control • Minor control • Moderate control • Significant control • Full control
Minimise administrative costs to farmers	Costs associated with applying for resource consents ($)

Explanation for the high level objectives and measures

Minimise risks to the health of humans and livestock, and improve the health of aquatic ecosystems

Poorly and untreated discharges of animal effluent and other farm wastewater can impact on aquatic ecosystems and the health of people and animals. Eliminating such discharges is likely to contribute to reducing faecal pathogen and ammonia levels and increasing dissolved oxygen levels in Northland's rivers.

It is difficult to quantify improvements in water quality resulting from a reduction in untreated and poorly treated discharges to water. It is also difficult to estimate the number of farms which do not have the recommended contingency storage as cow numbers, milking regimes and management (for example, stand-off practices) keep changing. It is clear however that much of the significant non-compliance identified at routine annual monitoring inspections happens during wet conditions in late winter through early summer when soils are saturated and farm systems and staff are operating under tremendous pressure. Water quality test results from unauthorised discharges, which often consist of untreated or very poorly treated wastewater, indicate that they can cause significant adverse effects on receiving waters. Farms which currently have adequate contingency storage and manage their systems properly are able to store enough wastewater through the pressure period to avoid having to apply wastewater to saturated soils or be forced to let their storage ponds overflow.

We have used a constructed measures because it is difficult to quantify estimated improvements in water quality associated with each of the management options. That is, the ability of the council to adequately control the activity, which ranges from no control (for example, a permitted activity rule with no conditions) to full control (a prohibited activity rule).

Minimise administrative costs to farmers

Administrative costs refer to the costs of applying for a resource consent and monitoring fees associated with a consented or permitted activity. Compliance costs (that is, the costs of complying with the rules or conditions of resource consents) are considered separately below.

The cost of applying for a non-notified resource consent is $840 and the associated annual monitoring cost for a consented discharge ranges from is $300. The annual inspection fee for a permitted discharge is $200. However, the monitoring costs can increase by several factors if significant non-compliance is detected.[74] The annual monitoring cost for a permitted discharge is $200. For the purpose of this report we have assumed that all farms are fully compliant with the conditions of rules and resource consents.

High level objectives not included

It is important to note that we have not included an objective of minimising compliance costs. These include the costs of complying with rules and conditions of resource consents (for example, constructing and upgrading effluent storage and disposal systems and paying any fines or legal costs).

This is because it is very difficult to quantify and standardise the costs of constructing and upgrading storage and disposal systems due to variety in herd sizes, existing infrastructure, milking regimes, rainfall and other factors such as soils and topography.

The purpose of the management options is to achieve adequate contingency measures on all farms that discharge to land. In other words, all farms (existing and new) should have appropriate contingency storage to prevent and minimise adverse effects on water quality. It is the speed of uptake that is likely to differ between the options.

A large percentage of farms have already diverted as much stormwater as is practicable from their storage ponds. The costs to divert stormwater are low (typically $200 for a downpipe, piece of spouting or a shovel to unblock a cut-off drain to several thousands of dollars for a complex plumbing system).

We have not included an objective of minimising administrative costs to council because the council's farm wastewater monitoring and compliance programme is mostly self-funding. This is because farmers pay monitoring fees and prosecution costs are generally recovered. This is unlikely to change across the management options.

Lastly, section 32 of the RMA requires an assessment of the impacts of the management options on economic growth and employment opportunities.[75] However the impact of the options on these is likely to be negligible and cannot be determined with any confidence. Therefore, economic growth and employment opportunities have not been included as high level objectives. For more information go to the section 1.7 'Assessing impacts on economic growth and employment opportunities'. It is useful to note though that cost of significant non-compliance can be, well, significant. Robust and fully compliant systems eliminate risks to the business and provides insurance against formal enforcement action. Milk processing companies are likely to require full compliance with environmental standards as a condition of milk supply contracts. Northland economy depends largely on primary production.

4.8.6 Evaluating the management options

High level objective	Measure	Option A: retain existing rules	Option B: amend the conditions of the permitted activity rule	Option C: control farm wastewater discharges to land by way of resource consents
Minimise: • Risks to the health of humans and livestock associated with contact with or ingestion of	The ability of the council to control the activity so that adverse effects are avoided, remedied, or mitigated:	Minor-moderate control	Moderate-significant control	Significant control

74 *See Northland Regional Council. Schedule of Fixed Initial Deposits.*

75 *s32(2)(a).*

High level objective	Measure	Option A: retain existing rules	Option B: amend the conditions of the permitted activity rule	Option C: control farm wastewater discharges to land by way of resource consents
freshwater (reduction in faecal pathogen loads) • Adverse effects on aquatic ecosystems (reduction in ammonia and organic loads)	• No control • Minor control • Moderate control • Significant control • Full control			
Minimise administrative costs to farmers	Costs associated with applying for resource consents ($)	$0 (assuming the conditions or the rule can be met)	$0 (assuming the conditions or the rule can be met)	Approx. $900 per resource consent application (not including preparation costs)

Certainty about the evaluation

There is always a degree of uncertainty associated with evaluating management options. With regard to this evaluation, we are most confident about the administrative costs associated with each option. On the other hand, we are less certain about the time-frames associated with upgrading effluent treatment and disposal systems to incorporate the adequate contingency storage so that discharges of poorly treated and untreated discharges of effluent to water are avoided. It is important to note however that significant non-compliance is often due to poor management and excessive effluent volumes rather than pond capacity.

Under Option A (status quo) we expect that all farms that currently do not have adequate contingency storage will eventually upgrade their systems. Enforcement (abatement notices, fines, and even prosecution) is likely to be the main way that this will occur. However, based on the current trends we expect that this will take the longest time of the three options.

On the other hand, Option B is likely to be a more efficient option because it clearly sets out the required minimum contingency storage (and other related measures). In other words, it addresses the lack of certainty in the current permitted activity rule. It is also likely to make monitoring and enforcement of the rule more effective and efficient.

We consider that Option C is likely to be the second fastest option to compel the necessary upgrades to systems. This is because it requires farmers to obtain resource consents and through the process negotiate the staging of upgrades. It is unlikely to be the quickest option because it involves the council processing around 255 resource consent applications (with current council resources).

Regardless, we consider that good management practices, including having adequate contingency storage, effective stormwater diversion, ensuring ponds are empty going into winter and avoiding the application of wastewater to saturated soils should be non-negotiable.

Time-frame of the evaluation

The time-frame of this evaluation is largely driven by the time to achieve the required uptake of adequate contingency measures. As estimated above, this could take up to 10 years under the current rules.

The preferred management option

Having examined the options for managing agricultural wastewater discharges we consider that Option B comes out on top. This is because it is likely to achieve the fastest uptake of contingency measures on farms to prevent and minimise untreated and poorly treated discharges of effluent to water, while having the lowest administrative costs to farmers.

4.9 Exclusion of livestock from water bodies and the coastal marine area

4.9.1 Executive summary

It is widely recognised that excluding livestock from water is a good management practice that can help improve water quality and aquatic habitats wherever it is implemented. The Regional Water and Soil Plan does not currently contain rules for the access of livestock to the beds of lakes and rivers and has a very weak (effectively unenforceable) rule for the grazing or access of livestock to the riparian margins of rivers, lakes, and wetlands.

The Regional Policy Statement for Northland 2016 states that the council will regulate the access of livestock to water bodies by, "where appropriate, requiring the restriction or exclusion of livestock to the coastal marine area, beds and margins of streams, rivers, lakes and wetlands, and encouraging livestock exclusion in other areas."

This evaluation looks at several options to do so. The most appropriate option is largely based on the recommendations of the Land and Water Forum[76], albeit in a slightly simplified way and with some more restrictive time frames for certain water bodies as shown in the following table.

Dates when livestock must be effectively excluded from water bodies and permanently flowing drains

Livestock type	Permanently flowing rivers, streams and drains greater than 1m wide and 30cm deep	All permanently flowing rivers, streams and drains	Natural wetlands (excluding significant wetlands)	Lakes (>1ha) and significant wetlands
Pigs and dairy cows	Excluded from the date this rule becomes operative.	Excluded from 1 January 2023	Excluded from 1 January 2023	Excluded from the date this this rule becomes operative.
Beef cattle, dairy support cattle and deer	**Lowland areas** (0-15°): Excluded 1 January 2025	**Lowland areas** (0-15°): Excluded from 1 January 2030	**Lowland areas** (0-15): Excluded from 1 January 2025	Excluded from the date this this rule becomes operative.
	Hill country areas (>15°): No exclusion required.	**Hill country areas** (>15°): No exclusion required.	**Hill country areas** (>15°): No exclusion required.	

People that are unable or unwilling to comply with the exclusion requirements have the opportunity to apply for a dispensation by way of a resource consent application under a restricted discretionary rule (or non-complying activity for livestock access to significant wetlands, outstanding freshwater bodies, or the coastal marine area).

The council considers that a policy should be included in the new plan that would direct decision-makers on applications for resource consent to allow livestock access to water bodies or the coastal marine areas to have particular regard to:

1) Any relevant priorities and recommendation in a farm plan prepared by Northland Regional Council; or
2) The need to extend the deadline for livestock to be excluded on the grounds of significant financial costs: or
3) The implementation of substitute mitigations such as constructed wetlands to avoid or minimise losses of sediment and faecal microbes to downstream water bodies and coastal waters.

76 *Recommendations 29-38, Land and Water Forum, 2015. The Fourth Report of the Land and Water Forum.*

4.9.2 Relevant provisions

This evaluation supports the following Regional Plan provisions:

- Policy D.4.3 - Exceptions to livestock exclusion requirements
- Rules C.8.1.1 - C.8.1.3 - Stock exclusion

4.9.3 The problem, opportunity and/or requirement

It is widely recognised that excluding livestock from water bodies is one of a number of good management practices that can be implemented on farms to help improve water quality. In fact, it is considered to be a universal good management practice, which means that it benefits water quality and aquatic habitats irrespective of where it is implemented.[77]

We do not currently regulate the access of livestock to the beds of lakes and rivers and has a very weak (effectively unenforceable) rule in the Regional Water and Soil Plan for the grazing or access of livestock to the riparian margins of rivers, lakes and wetlands. The riparian margin is a narrow strip of land (up to 20 metres in width) bordering the beds of water bodies. The Regional Coastal Plan prohibits the access of livestock to the coastal marine area.

Research has revealed that livestock are the main source of *E.coli* contamination in water (an indicator of the presence of faecal pathogens)[78]. The access of livestock to water bodies is likely to be a dominant pathway by which *E.coli* enters water during normal flow conditions (that is, outside of heavy rain fall events). Microbiological water quality is generally poor in most of Northland's rivers[79] and has the potential to impact on the health of humans and livestock.

River bed and bank erosion is a significant source of sediment in water bodies and the coastal marine area. This erosion process is exacerbated by livestock access. Sediment also carries phosphorus to water. Research suggests that sediment loads from the beds and banks of rivers can be reduced by between 30-90 percent by stock exclusion.[80] Livestock in water bodies also causes a range of other adverse effects including elevated nutrient loading and damage to instream physical habitat and riparian margins.

The extent of livestock exclusion in Northland is not well understood. In 2014, DairyNZ reported that approximately 94 percent of the country's water bodies that are caught by the Sustainable Dairying Water Accord (permanently flowing waterways and drains on dairy farms that are greater than one metre in width, lakes, and coastal water) have stock exclusion, although this has yet to be independently verified.[81]

Based on data from farm plans for a range of farms on different terrains we conservatively estimate that around 20 percent of permanently flowing rivers and streams on Northland dry stock farms and lifestyle blocks exclude stock from water bodies. The percentage is likely to be higher in lowland (that is, intensively farmed) areas.

These issues with the management and state of Northland's rivers compelled the council to issue policy direction on livestock access. The Regional Policy Statement for Northland 2016 states that we will regulate the access of livestock to water bodies by:[82]

1) Where appropriate, requiring the restriction or exclusion of livestock from the coastal marine areas, beds and margins of streams, rivers , lakes and wetlands;

2) Encouraging livestock exclusion in all other areas.

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77 *Land and Water Forum, 2015. The Fourth Report of the Land and Water Forum.*

78 *Northland Regional Council unpublished faecal source tracking data*

79 *When compared to the optional E.coli attribute states for primary contact recreation in Appendix 2 of the National Policy Statement for Freshwater Management 2014.*

80 *See Monaghan R., and Quinn J., 2010. Appendix 9: Farms, in: National Institute of Water and Atmospheric Research (NIWA), Waikato River Independent Scoping Study, NIWA, Hamilton; and McKergow L. A., Tanner C. C., Monaghan R. M., and Anderson G., 2007. Stocktake of diffuse pollution attenuation tools for New Zealand pastoral farming systems, NIWA Client Report HAM2007-16, Hamilton.*

81 *The Dairy Companies of New Zealand and DairyNZ, 2014. Sustainable Dairying: Water Accord - One Year On.*

82 *Policy 4.2.1, Regional Policy Statement for Northland 2016.*

4.9.4 Management options

This section summarises the management options for regulating the access of livestock to water bodies and the coastal marine area in order to maintain and improve water quality in Northland (among other benefits).

In the context of this evaluation the term livestock means dairy cows, dairy support cattle, beef cattle, pigs and deer. Sheep, goats and horses generally have a significantly lesser environmental impact on water quality and the costs of fencing to exclude them are very high (up to around $35 per metre of fence).

Option A: permit livestock access subject to conditions

This option permitting the access of livestock to water bodies provided that they do not:

- Discharge of dung and urine to water or the bed of a lake or river, or to a natural wetland;
- Disturb the bed of a lake or river; or
- Damage or destroy any native vegetation (excluding grasses) in or on the bed of a river or lake, or natural wetland.

The term "bed" has the same meaning as in the RMA: "in relation to any river…the space of land which the waters of a river cover at its fullest flow without overtopping its banks; and in relation to any lake…the space of land which the waters of the lake cover at its highest level without exceeding its margin".

Option B: exclude dairy cattle from waterways consistent with the Sustainable Dairying: Water Accord and permit other livestock access

This option involves embedding the requirements of the Sustainable Dairying: Water Accord as rules in the new regional plan. The accord requires most dairy farmers to exclude dairy cattle from permanently flowing waterways and drains greater than one metre in width and deeper than 30 centimetres and significant wetlands on dairy farms, by 31 May 2017. The access of other livestock to water would be a permitted activity subject to the conditions in Option A above.

Option C: exclude livestock from waterways largely consistent with the recommendation of the Land and Water Forum and exclude livestock from the coastal marine area

In 2015 the Land and Water Forum released its fourth report on how to maximise the economic benefits of freshwater while managing within water quality and quantity limits. It contains recommendations on regulating the access of livestock to water bodies[(83)]. This option involves largely adopting the recommendations.

In summary, the Land and Water Forum considers that the Government should promulgate national regulations on the access of livestock to water bodies. Specifically, dairy cows should be excluded from water bodies consistent with the Sustainable Dairying: Water Accord, and other livestock (pigs, beef cattle, deer, and dairy support cattle) should be excluded from permanently flowing rivers and drains wider than one metre wide and deeper than 30 centimetres over the next 10 years, and by 2025 for beef and deer in rolling hills. The Land and Water Forum also recommended that councils should have the discretion to exclude stock from water bodies ahead of the recommended time-frames.

This option involves largely adopting the recommended stock exclusion framework within the new regional plan, albeit in a slightly different way as follows:

- Treating dairy support cattle the same as beef cattle;
- Requiring that pigs and dairy cows are excluded from all permanently flowing rivers and drains (regardless of size), and beef cattle, dairy support cattle and deer are excluded from all permanently flowing rivers and drains in lowland areas;
- Specifying longer timeframe for dairy cows to be excluded from permanently flowing rivers and drains (2020 and 2023 depending on the their size) in recognition of potentially more fencing requirements than required by the Sustainable Dairying: Water Accord;
- Specifying shorter timeframes for excluding beef cattle and deer from natural wetlands;
- Only using two slope categories (0-15° and >15°), rather than three (0-3°, 4-15° and >15°; and
- Providing for stock crossing points.

83 *Recommendations 29-38.*

The reasons for requiring people to exclude livestock from all permanently flowing rivers and drains are:

1) It would increase the effectiveness of the policy approach; and

2) It would make the rule easier to monitor and enforce.

Rivers (including streams) vary in width depending as they flow through the landscape, for example, from 1.5 m to 0.7 m. A stock exclusion policy would not be effective if livestock were excluded in a patch-work manner involving some reaches being fenced and others not.

Under this option, the access of livestock to the beds of rivers and lakes and natural wetlands would be permitted for different time periods (depending on the type of livestock and the water body type) and then will became a restricted discretionary activity (non-notified) or non-complying activity (for access to significant indigenous wetlands, outstanding freshwater bodies and the coastal marine area). The following table provides an overview of this option.

Overview of Option D (note, all restricted discretionary activities will be non-notified).

Livestock type	Permanently flowing rivers, streams and drains greater than 1m wide and 30cm deep	Permanently flowing rivers, streams and drains	Natural wetlands (excluding significant wetlands)	Lakes (>1ha) and significant wetlands
Pigs and dairy cows	Excluded from the date this rule becomes operative	Excluded from 1 January 2023	Excluded from 1 January 2023	Excluded from the date this rule becomes operative
Beef cattle, dairy support cattle and deer	**Lowland areas** (0-15° Slope): Excluded from 1 January 2025	**Lowland areas** (0-15° Slope): Excluded from 1 January 2030	**Lowland areas** (0-15° Slope): Excluded from 1 January 2025	Excluded from the date this this rule becomes operative
	Hill country areas (>15°): No exclusion required	**Hill country areas** (>15°): No exclusion required	**Hill country areas** (>15°): No exclusion required	

Note that a natural wetland is defined here to mean:

"Any **wetland** including induced and reverted wetlands, regardless of whether it is dominated by indigenous vegetation, but does not include:

1) a constructed wetland, or

2) wet pasture, damp gully heads, or where water temporarily ponds after rain, or pasture containing patches of rushes."

A significant wetland is defined as:

"A **natural wetland** that triggers the significant criteria in the Regional Policy Statement, Appendix 5. This includes wetlands comprising indigenous vegetation exceeding any of the following area thresholds:

1) saltmarsh greater than 0.5 hectare, or

2) shallow water (margins of lakes and rivers) less than two metres deep and greater than 0.5 hectare, or

3) swamp greater than 0.4 hectare, or

4) bog greater than 0.2 hectare, or

5) pakikihi (including gumland and ironstone heathland) greater than 0.2 hectare, or

6) marsh, fen, ephemeral wetlands or seepage/flush greater than 0.05 hectare."

Option D: exclude livestock from all water bodies and the coastal marine area

This option involves requiring livestock to be excluded from all permanently flowing rivers, streams and drains, natural wetlands and lakes regardless of their location and also from the coastal marine area.

4.9.5 High level objectives and measures

Section 32 of the RMA requires the council to assess the efficiency and effectiveness of proposed provisions. We have done this by assessing the management options against a set of high level objectives and measures.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. Measures make the high level objectives specific and they are a metric for testing and comparing management options. The following table sets out the high level objective and associated measures used in this evaluation.

High level objectives and associated measures.

High level objective	Measure
Minimise costs to land owners	Cost ($) of excluding beef cattle from permanently flowing rivers on a typical dry stock farm
Minimise adverse effects on aquatic ecosystems and the health of livestock and people	The ability of the council to control the activity so that adverse effects are avoided, remedied, or mitigated: • No control • Minor control • Moderate control • Significant control • Full control

Explanation for the high level objectives and measures

Minimise costs to land owners

The first high level objective is to minimise costs to land owners of excluding stock from water bodies and the coastal marine area. It is based on the assumption that the full costs of exclusion will be borne by land owners. To date this has not always been the case as the council has provided subsidies and advisory services to assist people with excluding livestock from water bodies and the coastal marine area. It is beyond the scope of this evaluation to comment on whether this should continue.

We have used one measure to assess the costs of the management options. That being the cost of excluding livestock from permanently flowing rivers on a typical dry stock farm. We have omitted dairy farms on the basis that the industry has reported that they are already close to achieving full stock exclusion from permanently flowing rivers and streams, drains deeper than 30 centimetres and wider than one metre, and lakes.

We have also not considered the costs of excluding livestock from the coastal marine area because exclusion has been a requirement of the Regional Coastal Plan since 2009, and therefore the investment should have already been made. In addition, we have not assessed the costs of excluding livestock from natural wetlands in lowland areas and lakes due to uncertainties in the length of the margins of natural wetlands and lakes on a typical farm.

The following table sets out the typical costs of excluding livestock from water bodies. Note that the costs of fencing align with what the Ministry for the Environment and Ministry for Primary Industries recently calculated[(84)].

84 *Ministry for the Environment and Ministry for Primary Industries. 2016. National Stock Exclusion Study: Analysis of the costs and benefits of excluding stock from New Zealand waterways. MPI Technical Report No: 2016/55.*

Costs of excluding stock from water bodies.

Mitigation	Items required	Cost per item	Cost of item, excluding labour	Total cost of option
Fence out beef/dairy cattle	Fence stream bank with 3-wire electric fencing to exclude cattle	$2.25 per metre	$4.50 per metre (fence both sides)	$7.10 per metre (for rivers and streams)
	Water provision using 8 troughs per km of stream	Troughs cost $325 each. $325 x 8/1000 = $2.60m	$2.60 per metre	$4.85 per metre (lakes and coastal marine area)
Fence out all stock	Fence stream bank to exclude all stock	$16 per metre (for post and batten fencing)	$32 per metre (fence both sides)	$34.60 per metre (rivers and streams)
	Water provision using 8 troughs per km of stream	Troughs cost $325 each. 325 x 8/1000 = $2.60 per metre	$2.60 per metre	$18.60 per metre (lakes and coastal marine area)

Relevant information on a typical dry stock farm in Northland is set out in the following table. Note that the information contained in the table is based on a preliminary analysis and should be treated as such. Nevertheless, we think that it is reasonably representative of most dry stock farms in lowland areas. Agriculture Census (2012) data shows that approximately 80% of all specialised beef farms and 50% of all sheep and beef farms are less than 200 hectares in size.

The total estimated cost of excluding stock using a three wire electric fence from permanently flowing streams and rivers on a typical beef farm (with the characteristics in the following table) is approximately $25,000. This includes the provision of troughs but not reticulation costs.

Characteristics of a typical dry stock farm in Northland.

Average farm size	181 hectares
Average length of permanently flowing streams and rivers per hectare	0.0187km/ha (18.7m)
Average total length of permanently flowing streams and rivers per farm	3.38km (3380m)
Estimated current extent of stream fencing on a typical dry stock farm	20 percent[(85)]
Length of fencing required (both sides)	2.7km (2700m)

Reticulation can be expensive and unpractical, particularly in hill country areas. However it is difficult to determine the actual costs of reticulation that may be required as a consequence of excluding stock from water bodies. This is because of a range of variables including, but not limited to, the nature and size of farms, the coverage of existing reticulation, and physical factors such as topography.

The council's land management team has advised that they expect the majority of farms in lowland areas (<15° slope) have some reticulation. Lowland areas are typically intensively farmed.

85 *Advice from the council's land management department and the statistic used in the Whangarei Harbour Catchment Economic Modelling (Draft Report, Landcare Research, October 2015).*

In May 2011 NZ Landcare Trust with the support of PA Handford and Associates Ltd and AgFirst produced a short report on the financial impacts on unexpected adverse events on a Northland sheep and beef farm[86] The document sets out the likely cost of reticulating a typical sheep and beef operation with around 4,500 stock units, with an effective grazing area of 360 hectares across flats and rolling country. The cost is listed as $150,000. Upgrading or extending 25% of the system is likely to cost $37,500. We consider that these costs are a good proxy for the likely costs to farmers in lowland areas with no or partial reticulation. Although they are considerably higher than what the Ministry for the Environment and Ministry for Primary Industries recently determined[87].

It is important to note however that the proposed rules do not come into effect for beef farms in lowland areas for around 7 - 12 years (assuming the rule will become operative two years post the notification date of the plan), which provides farmers with a period to spread the investment. In addition, the proposed rules do not prohibit livestock access; they provide an opportunity for farmers to get dispensation to extend the deadline for fencing requirements or exclude other requirements through a resource consenting process.

The costs may be offset to an extent by financial benefits resulting from excluding livestock from water bodies and the provision of reticulated water. These are looked at in a report prepared by AgResearch for the council in 2012[88].

If the terrain is very difficult (for example, not accessible by machinery and rocky ground), or if electricity is not available, or certain stock types (for example, bulls) are present, then the costs for fencing both sides of the river or stream could be as high as approximately $20 per metre, with an additional cost of $2.60 per metre for the provision of water troughs. If these conditions were uniform across an entire farm with the typical characteristic in the following table then the total cost of fencing would be approximately $77,000.

Minimise adverse effects on aquatic ecosystems and the health of livestock and people

The second objective is to minimise adverse effects of livestock accessing water bodies on the health of aquatic ecosystems, livestock, and people. As discussed previously, it is widely recognised that livestock can cause a range of adverse environmental effects including damage and destruction of physical and biogenic habitats and water quality impairment. While there is reasonably good information on the effectiveness of excluding livestock from a water body in terms of reducing *E.coli* and sediment loads to water (see 'Effectiveness of excluding stock from water bodies in terms of E.coli and sediment loads to rivers during base flows'), it is challenging to model the impacts across a river network (notwithstanding lakes and wetlands). It is also is very difficult to accurately quantify the benefits of excluding livestock on water quality-dependent values (for example, native fish and mahinga kai) and physical habitats. Therefore, we have used a constructed measure to assess whether the management options are likely to effectively control (avoid or mitigate) adverse effects of livestock access to water bodies.

Effectiveness of excluding stock from water bodies in terms of E.coli and sediment loads to rivers during base flows

Description	*E. coli* (% reduction annual average)	Sediment (% reduction annual average)	Source
Fence out beef/dairy cattle.	60	80	Jon Dymond and Richard Muirhead.[89]
	30	40	Monaghan and Quinn, 2010.[90]

86 *PA Handford and Associated Ltd and AgFirst, 2011. Counting the Cost: The financial impacts of unexpected adverse events on a Northland sheep and beef farm. Prepared for NZ Landcare Trust.*

87 *Ministry for the Environment and Ministry for Primary Industries. 2016. National Stock Exclusion Study: Analysis of the costs and benefits of excluding stock from New Zealand waterways. MPI Technical Report No: 2016/55*

88 *Schutz K., 2012. Effects of Providing Clean Water on the Health and Productivity of Cattle. Prepared by AgResearch for Northland Regional Council. Client Report No: RE400/2012/346.*

89 *Personal comments, 2015.*

90 *Monaghan R., and Quinn J., t2010. Appendix 9: Farms, in National Institute of Water and Atmospheric Research (NIWA), Waikato River Independent Scoping Study, NIWA, Hamilton.*

Description	*E. coli* (% reduction annual average)	Sediment (% reduction annual average)	Source
	20-35	30-90	McKergow et al., 2007.[91]

High level objectives not included

Section 32(2)(a) of the RMA requires an assessment of the impacts on economic growth and employment opportunities. However, the impact of the management options on these matters is likely to be significant and/or cannot be determined with any confidence. Therefore, economic growth and employment opportunities have not been included as high level objectives. For more information go to the section 1.7 'Assessing impacts on economic growth and employment opportunities'.

4.9.6 Evaluating the management options

High level objective	Measure	Option A: permit livestock access	Option B: exclude dairy cattle and permit the access of other livestock	Option C: exclude livestock largely consistent with the recommendations of Land and Water Forum	Option D: exclude livestock from all water bodies
Minimise costs to land owners	Cost ($) of excluding beef cattle from permanently flowing rivers on a typical (~200ha) dry stock farm	$0	$0 (dairy farmers are required to exclude their stock from waterways by 2017 pursuant to the Sustainable Dairying: Water Accord, and have largely done so)	Approx. $25,000 for fences and troughs for a typical beef farm is in lowland areas Approx. $0-80,000 for water reticulation (including troughs) for a typical beef farm in lowland areas	Approx. $77,000 for a typical beef farm in hill country areas Unknown but significant costs for reticulating a typical beef farm in hill country areas
Minimise adverse effects on aquatic ecosystems and the health of livestock and people	The ability of the council to control the activity so that adverse effects are avoided, remedied, or mitigated: • No control • Minor control • Moderate control • Significant control	Minor control	Minor control over beef cattle and deer	Moderate-significant control	Significant control

91 *McKergow L. A., Tanner C. C., Monaghan R. M., and Anderson G., 2007. Stocktake of diffuse pollution attenuation tools for New Zealand pastoral farming systems, NIWA Client Report HAM2007-16, Hamilton.*

High level objective	Measure	Option A: permit livestock access	Option B: exclude dairy cattle and permit the access of other livestock	Option C: exclude livestock largely consistent with the recommendations of Land and Water Forum	Option D: exclude livestock from all water bodies
	• Full control				

Certainty about the evaluation

While livestock exclusion is widely recognised as a universal good management practice and the costs of excluding livestock from water bodies are generally understood, this evaluation (like most others) is characterised by uncertainties, particularly in relation to:

- The distribution of costs across different farms, which relates to a lack of information about the length of water bodies on each farm and lifestyle block and the amount of current fencing (we have made the assumption that dairy farms have already completed/near to completing the work);
- Quantitative relationships between stock exclusion and beneficial impacts on aquatic ecosystems and other in-stream values; and
- The costs to council associated with administering stock exclusion rules. This depends on the level of commitment and resourcing provided and has not been incorporated in this evalution.

Time-frame of the evaluation

While some benefits of excluding livestock from water bodies happen quickly (for example, improvements in microbiological water quality) others can take longer (that is, a reduction in sediment loads to estuaries due to a lag-time in a river system). Costs on the other hand are immediate. This evaluation looks at the costs of excluding livestock across different time-frames up to 2025, and across different spatial scales.

The preferred management option

Having considered the options, Option C is the preferred option. The option provides affected farmers with a reasonable amount of time to exclude stock prior requirements for resource consents taking legal affect.

It is important to note that we are not proposing a prohibited activity status for livestock access to water bodies. This means farmers will have the opportunity to apply for resource consent to allow access of livestock to water bodies where it is not practicable for them to exclude them, or to provide for the short-term grazing of the banks of water bodies during certain conditions. We suggest that a restricted discretionary activity would be the appropriate status for most water body types, with outstanding freshwater bodies being the exception (non-complying activity status), and consent applications would be non-notified.

A permitted activity rule would apply in the transitional periods (that is, before the stock exclusion dates take effect).

The council is also proposing to include the following policy in the plan that would guide decision makers when considering applications for resource consents to allow stock access to water:

When considering an application for a resource consent to allow livestock access to the bed of a lake or a permanently flowing river, a permanently flowing drain, a natural wetland, or the coastal marine area have particular regard to:

1) any relevant priorities and recommendation in a farm plan prepared or approved by Northland Regional Council, and

2) the need to extend the deadline for livestock to be effectively excluded on the grounds of significant practical constraints, and

3) the implementation of substitute mitigations such as constructed wetlands to avoid or minimise losses of sediment and faecal microbes to downstream water bodies and coastal waters.

4.10 Land disturbance activities

4.10.1 Executive summary

Erosion is a natural process involving the transfer of sediment from land to water bodies, estuaries, and the open sea. However the consequences of accelerated erosion caused by past and present land use activities include high sedimentation rates and reduced water clarity, which can cause a range of adverse effects on aquatic ecosystems and other beneficial values of water.

Aside from land under native forest, most sources of sediment are manageable to an extent. Land disturbance activities in particular expose soil and earth that can be mobilised by rain and enter fresh and coastal waters. Other sources include erosion of land under pasture and stormwater discharges. To date, soil conservation measures have not typically been required by RMA rules.

The Regional Water and Soil Plan regulates most types of land disturbance activities (cultivation, earthworks, vegetation clearance, and quarrying) for the purposes of minimising discharges of fine sediment to water. The current rules are generally considered to be effective but are characterised by several subjective and vague conditions. There is also justification for amending the setback distances from water courses and the thresholds for earthworks activities.

The council has looked at several regulatory options for land disturbance activities and considers that the appropriate management options are to:

1) Permit cultivation in most areas subject to conditions and regulate cultivation in a catchment of an outstanding dune lake, on highly erodible land, or in an ephemeral watercourse by a controlled activity rule;
2) Permit earthworks activities provided, among other conditions, that at any time the area of exposed unstabilised earth does not exceed 200m^2 within riparian setbacks, 2500m^2 on highly erodible land (mapped), and 5000m^2 in other areas. An activity that is unable to comply with the thresholds would be a controlled activity or otherwise a discretionary activity; and
3) Replace the three current permitted activity rules for vegetation clearance with a permitted activity rule for the clearance of native woody vegetation. An activity that is unable to comply with the rule would be a discretionary activity.

Note that stormwater management options are addressed in a separate evaluation (see 4.7 'Stormwater discharges') and earthworks and vegetation clearance rules relating to natural hazard management are addressed in 10 'Natural hazards'.

We have not assessed options for controlling land disturbance activities associated with plantation forestry. This is because at the time of writing this report the Government had publically stated its intention to issue national regulations for plantation forestry. In the interim (that is, prior to regulations being gazetted) land disturbance activities associated with plantation forestry will managed under the operative Regional Water and Soil Plan for Northland.

4.10.2 Relevant provisions

This evaluation supports the following Regional Plan provisions:

- Policy D.4.31 - Managing the effects of land disturbing activities
- Rules C.8.2.1 C.8.2.2 - Cultivation
- Rules C.8.3.1 - C.8.3.3 - Earthworks
- Rules C.8.4.2 - C.8.4.3 - Vegetation clearance

4.10.3 The problem, opportunity and/or requirement

Erosion is a natural process involving the transfer of sediment from land to lakes, rivers, estuaries and the open sea. However, accelerated erosion is widely recognised as a significant pressure on water quality-dependent uses and values in Northland.

Elevated levels of sediment can cause a range of adverse effects in fresh and coastal waters. Fine suspended sediments change two important optical characteristics of water: visual clarity and light penetration. Reductions in visual clarity can affect the foraging efficiency of fish and birds and the amenity of water bodies. Reduced light penetration can inhibit photosynthesis (that is, growth) of aquatic plants and algae. Suspended sediments can also irrigate, clog and damage the gills of aquatic fish and invertebrates, and effect some migratory fish species and the quality and quantity of food for aquatic species.

High rates of deposited sediment can smother habitats such as seagrass meadows and shellfish beds. Elevated sedimentation rates also increase the muddiness of estuarine environments. Sediment can also carry phosphorus into water, which is the main nutrient of concern in lake water quality management. Elevated sediment losses can also impact on the severity of flooding, navigation, irrigation, and mahinga kai (food gathering).

There are multiple sources of sediment, most of which are manageable. Land disturbance activities expose soil, which can be mobilised by rain and enter water bodies. Other sources include natural erosion processes on land that is under pasture and forests (native and exotic), and to date interventions such as soil conservation measures and good pasture management have been been encouraged by way of non-regulatory initiatives, such as subsidies, technical support, and advice. Other sources of sediment include stormwater discharges from urban areas and roads (addressed separately in 4.7 'Stormwater discharges') and the access of livestock to beds and banks or water bodies (addressed separately in 4.9 'Exclusion of livestock from water bodies and the coastal marine area').

The Regional Water and Soil Plan contains rules for the main types of land disturbance activities (earthworks, cultivation, quarrying and vegetation clearance), albeit with some exceptions. The 2014 review of the regional plan found, among other things, that overall the rules were moderately effective and efficient but should be amended to remove vague and subjective conditions and be strengthened by amending the earthworks thresholds.

There is also policy direction in the form of the Regional Policy Statement for Northland 2016 to improve the overall quality of Northland's fresh and coastal water with a particular focus on reducing sedimentation rates in the region's estuaries and harbours. *(92)*

4.10.4 Management options

This section identifies options for managing land disturbance activities in order to prevent and minimise earth being mobilised by rain and transferred to water. It is important to note that the council's RMA functions for controlling the use of land are limited to the following purposes:*(93)*

- Soil conservation;
- The maintenance and enhancement of the quality of water in water bodies and coastal water;
- The maintenance of the quantity of water in water bodies and coastal water;
- The maintenance and enhancement of ecosystems;
- The avoidance or mitigation of natural hazards*(94)* ; and
- The prevention or mitigation of any adverse effects of the storage, use, disposal, or transportation of hazardous substances*(95)*.

The council cannot issue rules for the protection of terrestrial biodiversity. That is a function of district councils.

Land disturbance activities can be grouped into the following categories: cultivation, earthworks, and vegetation clearance. We recommend that cultivation, earthworks, and vegetation clearance are carefully defined in the new regional plan as follows, so as to capture activities that have the potential to expose significant areas of earth or generate significant erosion, and conversely not regulate activities that are unlikely to be important sources of sediment:

92 *Policy 4.2.1, Regional Policy Statement for Northland 2016.*
93 *RMA s30(1)(c).*
94 *See section 10 of this report*
95 *See section 11 of this report*

1) "Cultivation" means the disturbance of earth by machinery in preparation for planting or replanting of pasture or crops, but excludes:
   a) direct drilling and no-till practices; and
   b) mechanical land preparation associated with plantation forestry (as defined in National Environmental Standards for Plantation Forestry).
2) "Earthworks" means the mechanical disturbance of the ground surface by excavation, cutting and filling, blading, ripping or contouring, or placing or replacing earth or soil, but does not include:
   a) earthworks associated with plantation forestry (as defined in the National Environmental Standards for Plantation Forestry);
   b) placement of cleanfill material (as defined);
   c) cultivation (as defined);
   d) construction of bores (as defined);
   e) maintenance or repair of walking and other recreational tracks;
   f) placement of roading aggregates during road and track works;
   g) digging post holes;
   h) domestic gardening; and
   i) planting trees.
3) "Vegetation clearance" means the cutting, burning, crushing of native woody vegetation, or vegetation in the coastal hazard management zone, but does not include clearing:
   a) plantation forestry (as defined in the National Environmental Standards for Plantation Forestry);
   b) hedges and amenity plants;
   c) vegetation along fences and around dams and ponds;
   d) vegetation that is part of an understory or a plantation forest or immediately adjacent to a plantation forest;
   e) vegetation around public network utilities;
   f) vegetation that impedes or is likely to impede flood flows; and
   g) vegetation for the maintenance of roads and tracks.

Cultivation

Generally speaking, the simplest way to minimise sediment loses from cultivated areas is to ensure that there are vegetative buffer strips between cultivated areas and water bodies. They intercept and slow surface water runoff allowing sediment to settle out. Riparian grass buffer strips are thought to achieve around a 40-50 percent reduction in sediment losses from high clay content soils and a 40-80 percent reduction in sediment losses from low clay soils.[96].

Dune lakes are particularly sensitive to sediment inputs because sediment carries phosphorus. They also have porous soils which phosphorus can travel through. Northland's dune lakes are typically phosphorus limited, meaning that phosphorus inputs have the potential to cause nuisance plant and algae growth. Cultivation needs to be well managed in the catchments of high value dune lakes[97].

Option A: retain existing rule

The first option is to retain the existing permitted activity rule for cultivation in the Regional Water and Soil Plan, which permits the cultivation of land provided that the activity does not occur within five metres of a water body and that it is carried out parallel to the contour, where feasible. Where it is not physically possible to cultivate land parallel to the contour due to the slope, sufficient runoff control measures must be provided to prevent erosion.

Option B: larger setbacks for sensitive water bodies

This option involves amending the existing permitted activity rule for cultivation by requiring a larger setback (>5m) lakes, wetlands, rivers and streams. It is important to note that there is no obvious evidence that grassed or vegetated buffers greater than 3-6m are significantly more effective at minimising losses to water.

96 *McKergow, L.A., Tanner, C.C., Monaghan, R.M., Anderson, G., 2007. Stocktake of diffuse pollution attenuation tools for New Zealand pastoral farming systems. In, NIWA Client Report: prepared for Pastoral 21 Research Consortium. National Institute of Water and Atmospheric Research, p. 102.*

97 *Dr Chris Tanner, NIWA, pers. comm., 2 November 2016*

Option C: retain existing setback (5m) but do not permit cultivation in the catchment of an outstanding lake, on highly erodible land, or in an ephemeral water course

This option involves permitting the cultivation of land provided that it does not occur:

- On highly erodible land;
- In the catchment of an outstanding dune lake;
- In an ephemeral water course; or
- Within 5 metres of a natural wetland, an artificial water course, or the bed of a river or lake.

Cultivation that is not a permitted activity would be classified as a controlled activity, which means that a resource consent is required for the council must grant a resource consent. However, the council's power to impose conditions on the resource consent is restricted to the matters over which control is observed. The matters of control in this option are:

1) Effects on water quality;
2) The scale, location, and timing of cultivation; and
3) Erosion and sediment control measures.

Earthworks

The main way to manage environmental risks associated with earthworks activities is by specifying aerial or volumetric earthworks thresholds in rules. Broadly speaking, the larger the earthworks operation the greater the potential risks to water quality. Risk also varies based on the nature of the soils (that is, their erodibility) and the sensitivity of receiving environment. It is useful to note that to date volumetric and area thresholds are the main trigger for resource consents for earthworks.

All of the following options involve requiring good management practices (that is erosion and sediment control measures). Good practice erosion and sediment control measures are widely recognised. The Erosion and Sediment Control Guidelines for Land Disturbing Activities in the Auckland Region 2016 contain the most relevant and comprehensive suite of erosion and sediment control guidelines.

Option A: permit earthworks with current thresholds

The first option permit earthworks and retain the current thresholds for earthworks activities. The current thresholds are as follows:

- Outside the riparian management zone[98] the maximum volume of moved or disturbed earth must not exceed 5000m^3 in any 12 month period where the activity is not undertaken on erosion-prone land;`
- Outside the riparian management zone the volume moved or disturbed must be less than 1000m^3 in any 12 month period and the surface area of the soil exposed must be less than 1000m^2 where the activity is undertaken on erosion-prone land; and
- Within the riparian management zone the maximum area of exposed soil must be less than 200m^2 and the volume moved must be less than 50m^3.

Option B: permit earthworks with revised thresholds

The second option is to permit earthworks but revise the earthworks thresholds. This involves using aerial and volumetric thresholds for exposed soil or earth. The aerial threshold would apply at any point in time rather than during a 12 month period. Changing the compliance metric from a 12 month period to any point in time provides more flexibility to people doing earthworks. The thresholds are:

- Within 10m of a natural wetland, the bed of a river or lake - 200m^2 of exposed unstabilised soil or earth[99] at any one time and 50m^3 of moved or placed earth;

98 *The Regional Water and Soil Plan defines the riparian management zone as the land between the bed of a river, lake, or indigenous wetland, or the coastal marine area and a distance measured inland from the bank of the water body or from the top of the bank adjacent to the coastal marine area of: (a) 5m where the dominant slope is less than 8 degrees, (b) 10m where the dominant slope is between 8-15 degrees, and (c) 20m where the dominant slope is greater than 15 degrees.*

99 *The term unstabilised refers to earth that is not protected or reinforced by good practice measures (vegetative and/or structural) to prevent erosion, or that is not naturally stable, for example, rock faces earth*

- Within the catchment of an outstanding lake - 2500m^2 of exposed unstabilised earth at any one time;
- Highly erodible land - 2500m^2 of exposed unstabilised earth at any one time; and
- All other areas - 5,000m^2 of exposed unstabilised earth.

An activity that would not meet the rule would be a controlled or discretionary activity.

Option C: require all earthworks activities to be authorised by resource consent

The third option is to not permit earthworks activities. That is, require all earthworks to be authorised by resource consents under a controlled or discretionary activity rules.

Vegetation clearance

The main issue associated with vegetation clearance is that it can expose soil to rainfall, particularly during and just after the activity. Vegetation dissipates the energy of rain and in turn reduces the amount of soil mobilised. Woody vegetation also stabilises land with its roots. Note that the following options only address vegetation clearance outside of the coastal marine area and freshwater bodies.

Option A: retain current rules for vegetation clearance

The first option is to retain the three existing rules that permit vegetation clearance. The three rules address vegetation clearance that (1) is not on erosion-prone land, and is not in the riparian management zone, (2) is on erosion-prone land that is not in the riparian management zone, and (3) vegetation clearance in the riparian management zone.

Option B: streamline and simplify the current rules

This option involves rationalising the current permitted activity rules into one permitted activity rule, removing subjective terms, and aligning the conditions with good management practices for erosion and sediment control. An activity that does not meet the rule would be a discretionary activity.

Option C: require all vegetation clearance activities to be authorised by resource consent

The third option is to regulate vegetation clearance activities by way of resource consents. Specifically, vegetation clearance in sensitive areas (highly erodible land and riparian areas) would be a discretionary activity and in all other areas a controlled activity.

4.10.5 High level objectives and measures

Section 32 of the RMA requires the council to assess the efficiency and effectiveness (that is, the appropriateness) of proposed provisions. We have done does this by assessing the management options against a set of high level objectives and measures.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. Measures make the high level objectives specific and they are a metric for testing and comparing management options. The following table sets out the high level objectives and associated measures used in this evaluation.

High level objectives and associated measures

High level objective	Measure
Minimise administrative costs to resource users	Expected change in (increase or decrease) in the number of resource consents required: • No change. • Small change • Moderate change • Large change

High level objective	Measure
Minimise adverse effects on aquatic ecosystems and other uses and values of water that can be affected by sediment	The ability of the council to control the activity so that adverse effects are avoided, remedied, or mitigated: • No control • Minor control • Moderate control • Significant control • Full control

Explanation for the high level objectives and measures

Minimise costs to resource users

The first high level objective is to minimise costs to resource users. Costs fall into two categories: administrative costs and compliance costs. Administrative costs refer to the costs associated with applying for resource consents. Compliance costs refer to the costs of meeting conditions of rules and resource consents.

This evaluation focuses only on administrative costs because good practice erosion and sediment control measures are generally well recognized and should be implemented. The management options reinforce recognised good practice measures and therefore should not result in any additional costs to resource users. Compliance costs are difficult to quantify because they differ depending on the location, nature, scale and intensity of the land disturbance activity, and the experience of the person doing the activity.

We have used a constructed measure (the expected change in the number of resource consents required) to gauge the likely administrative costs of each management option.

Minimise adverse effects on aquatic ecosystems and other uses and values of water

The other high level objective is to minimise adverse effects on aquatic ecosystems and other water quality-dependent values. As discussed previously, elevated sediment inputs to fresh and coastal waters can cause a range of adverse effects on aquatic ecosystems. The purpose of controlling land disturbance activities is to minimise sediment discharges to water. Short of banning land disturbance activities it is very unlikely that all sediment can be prevented from entering adjacent water bodies during heavy rainfall.

It is very difficult (indeed impossible) to accurately quantify the effectiveness of a particular land disturbance activity rule in minimising adverse effects on aquatic ecosystems because there are so many variables, including climate, geology, soil type, and slope that can impact on the efficacy of a rule. Therefore, we have used a constructed measure (the ability of the council to adequately control the activity) to consistently assess the management options with respect to the high level objective.

High level objectives not included

Section 32(2)(a) of the RMA requires an assessment of the impacts on economic growth and employment opportunities. However, the impact of the management options on these matters is likely to be insignificant and cannot be determined with any confidence. Therefore, minimising impacts on economic growth and employment opportunities have not been included as high level objectives. For more information go to the section 1.7 'Assessing impacts on economic growth and employment opportunities'.

In all other respects, we consider that the high level objectives summarised above adequately capture all of the things that matter to people when making a decision on the most appropriate management option for controlling land disturbance activities.

4.10.6 Evaluating the management options

Evaluation of management options for cultivation.

High level objective	Measure	Option A: retain existing rules	Option B: permit subject to larger setbacks otherwise consent required	Option C: permitted activity outside certain sensitive areas
Minimise administrative costs to resource users	Expected change in (increase or decrease) in the number of resource consents required: • No change. • Small change • Moderate change • Large change	No change (to date, no applications have been received for cultivation under the current rules)	large increase (unquantified)	Small increase (unquantified)
Minimise adverse effects on aquatic ecosystems and other uses and values of water that can be affected by sediment	The ability of the council to control the activity so that adverse effects are avoided, remedied, or mitigated: • No control • Minor control • Moderate control • Significant control • Full control	Moderate control	Moderate control	Moderate to significant level of control

Evaluation of management options for earthworks

High level objective	Measure	Option A: permit earthworks with current thresholds otherwise consent required	Option B: permit earthworks with revised thresholds otherwise consent required	Option C: require earthworks activities to be authorised by resource consents
Minimise administrative costs to resource users	Expected change in (increase or decrease) in the number of resource consents required: • No change. • Small change • Moderate change • Large change	No change	Moderate reduction	Large change
Minimise adverse effects on aquatic ecosystems and other uses and values of	The ability of the council to control the activity so that adverse effects are avoided, remedied, or mitigated:	Moderate level of control	Moderate-significant level of control	Significant level of control

High level objective	Measure	Option A: permit earthworks with current thresholds otherwise consent required	Option B: permit earthworks with revised thresholds otherwise consent required	Option C: require earthworks activities to be authorised by resource consents
water that can be affected by sediment	• No control • Minor control • Moderate control • Significant control • Full control			

Evaluation of management options for vegetation clearance.

High level objective	Measure	Option A: retain current rules for vegetation clearance	Option B: streamline and simplify the permitted activity current rules	Option C: require vegetation clearance activities to be authorised by resource consents
Minimise administrative costs to resource users	Expected change in (increase or decrease) in the number of resource consents required: • No change • Small change • Moderate change • Large change	No change (the council currently receives on average 8 resource consent applications for vegetation clearance, mainly plantation forestry)	Large reduction (mainly because the rules under this option do not apply to plantation forestry)	Large increase
Minimise adverse effects on aquatic ecosystems and other uses and values of water that can be affected by sediment	The ability of the council to control the activity so that adverse effects are avoided, remedied, or mitigated: • No control • Minor control • Moderate control • Significant control • Full control	Moderate level of control	Moderate level of control	High level of control

Certainty about the evaluation

Cost-benefit analyses are typically characterised by uncertainty, and this one is no different. First, minimum setbacks for land disturbance activities are commonly used in rules and recommended in erosion and sediment control guidelines[100] but there is no definitive setback distance, and ultimately those listed in the management options are to an extent, subjective.

Similarly, the area-based earthworks thresholds are also subjective and are largely informed by approaches taken by other regional councils. Nonetheless, we have attempted to strike a balance between being flexible and enabling to resource users and being able to exercise a level of control over earthworks activities.

Time-frame of the evaluation

This evaluation applies to the lifetime of the new plan (circa. 10 - 15 years).

The preferred management options

Based on the assessment the we consider that the appropriate management options are (as summarised) below:

1) Permit cultivation in most areas subject to conditions and classify cultivation in a catchment of an outstanding dune lake, on highly erodible land, or in an ephemeral water course as a controlled activity;
2) Permit earthworks activities subject to conditions, including that at any time the area of exposed earth must not exceed 200m^2 within riparian setbacks, 2500m^2 on highly erodible land (mapped), and 5000m^2 in other areas. An activity that is unable to comply with the thresholds would be a controlled activity or otherwise a discretionary activity; and
3) Replace the three current permitted activity rules for vegetation clearance with a permitted activity rule for the clearance of native woody vegetation. An activity that is unable to comply with the rule would be a discretionary activity.

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100 *For example, Horticulture New Zealand's Erosion and Sediment Control Guidelines for Vegetable Production 2014 recommends that vegetated buffer strips and riparian margins should be at least 3 to 6 metres wide.*

4.11 Other discharges

Introduction

This section of the report looks at options for managing discharges that have not been addressed elsewhere in this report. They are typically minor discharges and without rules permitting them they would require resource consent[101]. The review of the Regional Water and Soil Plan and Regional Coastal Plan did not identify any significant (that is, noteworthy) issues with the current controls on these "other" discharges.[102] However, there is justification for simplifying and streamlining some of the current rules.

This evaluation differs from others in that it does not assess a range of alternative management options for each category of discharge. Rather, it directly makes recommendations on rules to be included in the new regional plan. This is because the management options are obvious or the potential adverse environmental effects of the activities are not significant.

The problem, opportunity, or requirement

Section 15(1) of the RMA prohibits any person from discharging any (a) contaminant or water into water, or (b) contaminant onto or into land in circumstances which may result in that contaminant entering water, or (c) contaminant from any industrial or trade premises onto or into land, unless the discharge is expressly allowed by a national environmental standard or other regulations, a rule in a regional plan as well as a rule in a proposed regional plan, or a resource consent. This means that in the absence of a regional plan or national environmental standard minor discharges would need to be authorised by resource consents.

The council needs to determine the most appropriate set of rules for permitting or controlling by resource consent discharges that have not been assessed in other evaluation reports.

Recommended management options

Discharges of tracers

Tracers such as salts and dyes are commonly added to water to determine flow paths of water within a system (such as an aquifer), to determine residence times, and to identify holes or cross connections between wastewater and stormwater networks, for example. Discolouration of water by dye is generally temporary. Tracers typically do not adversely impact aquatic species.

The Regional Water and Soil Plan currently permits the discharge of tracers (fluorescent dyes, salts, non-pathogenic microorganisms and plant spores) to freshwater. We recommend that the new plan continues to expressly permit such discharges to water subject to conditions including that:

- The discharge is not upstream of any abstraction point for a registered drinking-water supply, unless approved by the water supplier; and
- The tracer is of a type designed for use in water and is used in accordance with the manufacturer's recommendations and any recognised standards and practices, and

Dust suppressants

The Regional Water and Soil Plan permits the discharge of lignin-based products onto or into land for the purpose of dust suppression on unsealed roads subject to conditions. The discharge to land of bituminous emulsions designed for the suppression of dust, and oil which is unused or uncontaminated and which does not contain additives for the purpose of dust suppression are a discretionary activity. The discharge of petroleum oil and diesel on to land as a dust suppressant is a prohibited activity.

101 *See s15(1) RMA*

102 *www.nrc.govt.nz/contentassets/0d3e217aec2346549fdbd0b3e579c501/regional-plan-review-summary---water-quality.pdf*

We propose that the three-tiered rule in the Regional Water and Soil Plan be replaced with a simplified permitted activity rule. The new rule provides for the use of non-hazardous dust suppressants and dust suppressants containing hazardous substances provided dust suppressants containing hazardous substances are applied in accordance with their Environmental Protection Authority controls and no dust suppressants are applied directly to water.

Any application of dust suppressants unable to meet these conditions would be a discretionary activity.

Discharge (application) of fertiliser to land

The Regional Water and Soil Plan permits the discharge (that is, application) of fertiliser into or onto land provided that "all reasonable steps are taken to ensure that the fertiliser is applied in a manner which minimises the potential for contaminants to enter water, directly or indirectly, as a result of the discharge".

The condition is subjective, which makes it difficult to comply with, monitor, and enforce. Consistent with the findings of the review of the regional plan we recommend that the rule be amended to provide greater clarity by specifying setback distances from water bodies when applying fertiliser to land. We also recommend that a condition is included in the rule that stipulates that fertiliser use must be done in accordance with sections 5.2 and 5.3 of the Fertiliser Association of New Zealand's *Code of Practice for Nutrient Management (2013)*, which contain guidance on using fertiliser in a way that minimises adverse effects on the environment.

Contaminants from the making of silage and the disposal of offal and dead stock

The leachate from the decomposition of plant and animal matter contains high levels of organic compounds, nutrients and microbes which can have an adverse impact on water quality, and in turn the health of aquatic ecosystems and people.

The Regional Water and Soil Plan permits the discharge of contaminants into or onto land in association with the making of silage and the disposal of dead stock and offal subject to several conditions, including setbacks from water bodies, water supply bores and residences, and maximum volumes of the dead stock offal and silage. We have not identified any significant issues with the rule and it should largely be retained in the new plan. However, we recommend that additional conditions on setbacks from a property or dwelling owned by another person unless a smaller setback is permitted by that person, and a setback from a road or public space. The purpose of these conditions is to mitigate the potential for nuisance odour and risks to human health.

Wastewater discharges from industrial and trade premises

The RMA defines an industrial and trade premises as:

1) any premises used for any industrial or trade purpose; or

2) any premises used for the storage, transfer, treatment, or disposal of waste materials or for other waste-management purposes, or used for composting organic materials; or

3) any other premises from which a contaminant is discharged in connection with any industrial or trade process – but does not include any production land[(103)] .

The Regional Water and Soil Plan permits industrial and trade wastewater discharges to land subject to conditions, including discharge concentration standards for some toxicants, suspended sediment and faecal coliforms, maximum daily volumes, horizontal and vertical setbacks, and the design, operation and construction of the wastewater treatment and disposal system. Wastewater discharges from industrial or trade premises into land that does not comply with the conditions of the permitted activity rule or that are into water are a discretionary activity. The council considers that it appropriate to retain the current rules albeit with some minor changes.

Sewage discharges from boats

The Operative Regional Coastal Plan contains several rules setting out minimum distances from shore and minimum depths for discharging untreated sewerage from ships or offshore installations. These provisions largely align with the Resource Management (Marine Pollution) Regulations 1998. In the case of Northland's east coast harbours, the operative Regional Coastal Plan is more restrictive than the Resource Management (Marine Pollution) Regulations, as it prohibits the discharge

103 *"any land and auxiliary buildings used for the production (but not processing) of primary products (including agricultural, pastoral, horticultural, and forestry products) [and] does not include land or auxiliary buildings used or associated with prospecting, exploration, or mining for minerals)"*

of untreated sewerage with most harbours. In other situations the provisions of the Coastal Plan are more lenient than the minimum standards set out in the Resource Management (Marine Pollution) Regulations. In these instances the Resource Management (Marine Pollution) Regulations prevail.

The approach taken in the Operative Regional Coastal Plan appears to be well accepted by the public and is working well. It recommended that the existing approach is largely rolled over into the new Regional Plan. There are three instances where we recommend changes to the current approach. These are outlined below:

1) In the Bay of Islands the provisions of the Resource Management (Marine Pollution) Regulations 1998 provide for untreated sewage to be discharged in or near areas that are heavily used for recreational swimming, diving and shellfish collection. There is a potential conflict between these uses and the discharge of untreated sewage. Anecdotal evidence also suggests that the discharge of untreated sewage in these areas are no long accepted by the public. The proposal is to increase the minimum distance from land where a vessel can discharge untreated sewerage from 500m to;
   a) one kilometre for small vessels
   b) outside the harbour limits for large vessels (certified to carry more than 49 passengers and crew)

   The setbacks from land have been increased to better manage the potential conflict between sewage discharges from vessels and people swimming, diving and collecting seafood in the Bay of Islands. A greater distance from shore has been applied to vessels able to carry large numbers of people. This approach has been taken because these vessels can store and discharge larger volumes of untreated sewage. This poses a greater risk to the public. To manage this increased risk council has imposed a larger setback from high use recreational areas.

2) The Coastal Plan allows discharges of untreated sewage in the Whangaruru and Whangaroa Harbours. The proposal is to remove the discharge areas within the harbours, requiring vessels to pump their sewage to treatment facilities on land or navigate outside the harbour to discharge untreated sewage.
3) It is also recommended that provisions of the Operative Regional Coastal plan that are more lenient than the Resource Management (Marine Pollution) Regulations 1998 are removed. These provisions have been superseded by the Resource Management (Marine Pollution) Regulations 1998 and are now redundant.

Other

There are a range of other discharges such as emptying swimming pools and spa water onto land where it may enter water or directly to water, water from propulsion units and vessels, sluicing water from potable water networks, and incidental contaminants from maintaining or constructing structures adjacent to or over water bodies (for example, bridges and roads). These activities generally only have very minor or no adverse effects on the environment. The council considers that it is appropriate to retain the operative rules for controlling these activities

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5 Water quantity

5.1 Legal and planning background

Resource Management Act 1991

The RMA is the principle statute for the management of New Zealand's water resources and it tasks regional councils with managing water quantity. This is done primarily through regional plans, which contain policies and rules that control the taking, use, damming, and diversion fresh water. Regional councils can also regulate the use of land for the purpose of maintaining the quantity of water in water bodies and control the quantity, level, and flow of water in any water body.[1]

Under the RMA, water quantity is normally allocated on a 'first-in, first-served' basis. However, regional councils also have the ability to allocate water to different uses.[2] This is not commonly done because it means that councils are required to make judgement calls about the appropriate (most effective and efficient) use of water, which is very difficult.

Central government can promulgate national policy statements that direct the RMA functions of regional councils. National policy statements contain objectives and policies that regional councils must give effect to through their plans and have regard to when considering applications for resource consents. Currently, there is only one national policy statement that directs the management of freshwater quantity (and quality), that is, the National Policy Statement for Freshwater Management 2014.

The National Policy Statement for Freshwater Management 2014 sets out a nationally consistent approach to managing freshwater quantity. In summary, it directs regional councils to set freshwater quantity objectives (desired environmental outcomes) and associated water quantity limits (minimum flows/water levels and allocation limits) for all freshwater management units[3] in their regions. Objectives and limits must be set to protect, at a minimum the life-supporting capacity, ecosystem processes and indigenous species including their associated ecosystems, of fresh water. The national policy statement also requires regional councils to, among other things:

- avoid and phase out over-allocation, which is the situation where the resource (a) has been allocated to users beyond a limit, or (b) is being used to a point where the freshwater objective is no longer being met;
- ensure that regional plans provide for the efficient allocation of fresh water to activities, within water quantity limits; and
- ensure that regional plans contain criteria by which applications for applications for approval of transfers of water permits are to be decided, including to improve and maximise the efficient allocation of water.

Regional councils are required to implement the National Policy Statement for Freshwater Management by 31 December 2025 or by 31 December 2030 if a regional council considers that (a) meeting the earlier date would result in lower quality planning, or (b) it would be impracticable for it to complete implementation of a policy by that date.

The Regional Policy Statement for Northland 2016 also provides direction on freshwater quantity management. It reinforces the aims of the National Policy Statement for Freshwater Management and provides additional direction on managing the efficient allocation and use of water and avoiding and phasing out over-allocation. It also recognises and promotes the benefits of water harvesting, storage and conservation methods.

Land Drainage Act 1908, Soil Conservation and Rivers Control Act 1941 and the Local Government Act 1974

Land drainage activities involve the taking, diverting and discharge of water – activities that are restricted by sections 13, 14 and 15 of the RMA. The Land Drainage Act 1908, Soil Conservation and Rivers Control Act 1941 and the Local Government Act 1974 also provide local authorities to functions around land drainage and river control. However, they do not override the responsibilities and restrictions under the Resource Management Act.

The regional council manages rivers and catchments under the Soil Conservation and Rivers Control Act 1941, which includes provisions for "*the prevention of damage by erosion*" and *"the protection of property from damage by floods*". The Soil Conservation and Rivers Control Act provides a mandate for the maintenance and control of waterways for the purposes of

1 *RMA s30(1).*

2 *RMA s30(4).*

3 *A freshwater management unit is defined as a "water body, multiple water bodies or any part of a water body determined by the regional council as the appropriate spatial scale for setting freshwater objectives and limits and for freshwater accounting and management purposes."*

flood hazard mitigation. Within the general powers (section 126) of the Soil Conservation and Rivers Control Act, the principal function of the regional council is to minimise and prevent damage within its region from flooding and erosion. It allows regional councils to maintain and improve watercourses to avoid flooding and erosion.

Northland Regional Council is able to do river management works under the Soil Conservation and Rivers Control Act 1941 and land drainage works under the Land Drainage Act 1908. As the catchment board for Northland, it is also required to exercise general supervision with respect to the exercise and performance by the district councils of any powers, functions and duties relating to river and drainage management and may issue general or specific instructions to the district councils.

Compared with the RMA, the Soil Conservation and River Control Act 1941, the Land Drainage Act 1908 and the Local Government Act 1974, all place a greater responsibility on landholders to manage watercourses, and on the catchment board (Regional Council) and district councils to ensure that the integrity of watercourses as flood channels and drainage outfalls are maintained. Legally, it is the land owner or occupier's responsibility to maintain watercourses on their property to provide a free flow of water. The regional council can, under the Land Drainage Act 1908 and the Local Government Act 1974 require any land owner to do so[4]. Should the landholder not do so, the council may undertake the work and recover the costs.

In 1989 the management of all the drainage districts in existence at that time was vested to district councils. The three councils continue to manage these schemes, either directly or through land owner committees. The district councils may undertake river and drainage works under the Local Government Act 1974 and land drainage under both the Local Government Act and the Land Drainage Act.

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4 *see section 62 of the Land Drainage Act and section 511 of the LocalGovernment Act 1974.*

5.2 Freshwater quantity objectives and limits

5.2.1 Executive summary

The National Policy Statement for Freshwater Management 2014 directs the council to establish freshwater quantity objectives (intended environmental outcomes) and water quantity limits ("Environmental flows and/or levels")[5] for all freshwater management units[6] within the region.

Rivers

We are proposing to group Northland's rivers into four river water quantity management units:

1) Coastal rivers;
2) Small rivers;
3) Large rivers; and
4) Outstanding rivers.

We assessed several minimum flow and allocation limit options for each management unit using a combination of hydrological 'rules of thumb' and modelling[7]. The options provide for the protection of aquatic ecosystem health, some important cultural fish species (short and long fin eels, or "tuna"), and availability and reliability of water for consumptive uses.

Having considered the potential consequences of the options we consider that the following water quantity limits are the most appropriate to include in the new regional plan. We consider that they strike an appropriate balance between protecting instream values and ensuring access to reliable fresh water for out of stream uses.

Freshwater management unit	Minimum Flow (% of mean annual 7-day low flow)	Allocation limit (% of mean annual 7-day low flow)
Outstanding rivers	100%	10%
Coastal rivers	90%	30%
Small rivers	80%	40%
Large rivers	80%	50%

We are also proposing to provide for supplementary (or, secondary) allocation from rivers. Supplementary allocation is the amount of water available for use at times when a river is above its median flow. The water is not part of the allocation limits described above.

5 *The National Policy Statement for Freshwater Management defines environmental flows and/or levels as a type of limit which describes the amount of water in a freshwater management unit (except ponds and naturally ephemeral water bodies) which is required to meet freshwater objectives. Environmental flows for rivers and streams must include an allocation limit and a minimum flow (or other flow/s). Environmental levels for other freshwater management units must include an allocation limit and a minimum water level (or other level/s).*

6 *A freshwater management unit is a water body, multiple water bodies, or any part of a water body determined by the regional council as the appropriate spatial scale for setting freshwater objectives and limits and for freshwater accounting and management purposes.*

7 *Environmental Flow Strategic Assessment Platform (EFSAP), NIWA.*

Lakes and wetlands

We are proposing to group Northland's lakes into two lake management units (lakes less than or equal to ten metres deep and lakes deeper than ten metres) for the reason that lake depth is the single factor that best discriminates variation in lake water quality in the region.[8] There are many drivers of lake water quality and patterns are often complex. It is useful to note that these groupings align with technical recommendations on managing lake water quantity.[9]

Unlike rivers there is no readily available tool to assess the consequences of different water quantity limits for multiple lakes. Therefore we are proposing to set minimum levels for lakes based on technical considerations in *Draft Guidelines for the Selection of Methods to Determine Ecological Flows and Water Levels 2008*[10], which are set out in the following table. A high level of protection is justified because most of Northland's lakes are dune lakes, which internationally are a rare aquatic ecosystem type, and are generally small and shallow.

Freshwater management unit	Level limit	Comment
Deep lakes (>10m)	Less than 0.5m change to median lake level, less than 10% change in mean annual lake level fluctuation and patterns of lake level seasonality (relative summer vs. winter levels) remain unchanged from the natural state.	Low risks associated with changes to lake levels.
Shallow lakes (≤10m)	Less than 10% change in median lake level, less than 10% change in mean annual lake level fluctuation and patterns of lake level seasonality remain unchanged from the natural state.	Low risks associated with changes to lake levels.

For wetlands, we are proposing to use the default water quantity limit recommended in the Proposed National Environmental Standard on Ecological Flows and Water Levels 2008. That is, there must be no change in wetland water levels beyond the water level variation that has been provided for by resource consents on the date new plan is notified. We consider that this conservative limit is justified because the protection of wetlands is a national priority for biodiversity and habitats for rare and threatened species,[11], and they are greatly diminished in extent. Even small changes in water levels can impact on their ecology.

Aquifers

We are proposing to adopt the recommended limits in the Proposed National Environmental Standard on Ecological Flows and Water Levels 2008 for sustainably managing Northland's groundwater management units, albeit with a 33% lower allocation limit for coastal aquifers (10% rather than a 15% annual average recharge). The management units and allocation limits are listed below.

1) Coastal aquifers: 10% of the annual average recharge; and

2) Other aquifers: 35% of the annual average recharges.

Note that we are also proposing specific (that is, tailored) allocation limits for a number of aquifers within the Aupouri Peninsula. We have collected groundwater level and groundwater quality information on the Aupouri aquifer since the 1980's. The information has allowed us to develop an understanding of the system This includes producing reports such as Aupouri Peninsula Water Resource Assessment 1991, Aupouri Aquifer Sustainable Yield Modelling Study 2000, Awanui Modelling Report 2007, and the most recent comprehensive modelling report Aupouri Aquifer Review 2015.

The 2015 report describes the conceptual understanding of aquifer, the rainfall recharge mechanisms and recharge rates based on soil moisture balance modelling. The report divides the aquifer into nine subzones based on a number of factors including land use, groundwater flow direction, topography and areas of high demand. A numerical model of the aquifer

8 *Snelder, T., Hughes, B., Kelly, D., and Stephens, T. 2016. Lake FMUs for Northland: Recommendations for Policy Development. LWP Client Report Number: 2016-003.*

9 *See Ministry for the Environment, 2008. Draft Guidelines for the Selection of Methods to Determine Ecological Flows and Water Levels. Prepared by Beca Infrastructure Ltd for MfE. Wellington: New Zealand.*

10 *Ibid.*

11 *Ministry for the Environment, 2007. Protecting our Places: Information about the Statement of National Priorities for Protecting Rare and Threatened Biodiversity on Private Land. Wellington, New Zealand.*

was then used to assess how much water could be taken from each subzone on an annual basis without causing saltwater intrusion into the aquifer along the coast. The levels of uncertainty in the results for each zone were assessed and climate change predictions were also applied.

We are also developing a better understanding of other aquifers in the region so that we can set specific allocation limits for them. Immediate priorities include the Ruawai, Mangawhai, Russell, Maunu, Mangatapere and Whatitiri aquifers; followed by the Ngunguru, Matapouri and Whangaumu aquifers.

Fully allocated water bodies

It is important to note that we are proposing to cap the allocation in catchments where the total current allocations exceed the default allocation limits. That is, until such time as work is undertaken by the council or another person to justify a higher (or potentially lower) allocation limitthrough a plan change process.

5.2.2 Relevant provisions

This evaluation supports the following regional plan provisions:

- Policy D.4.13 - Achieving water quantity related outcomes
- Policy D.4.14 - Minimum flows for rivers
- Policy D.4.15 - Minimum levels for lakes and wetlands
- Policy D.4.16 - Allocation limits for rivers
- Policy D.4.17 - Allocation limits for aquifers

5.2.3 The problem, opportunity and/or requirement

A key directive in the National Policy Statement for Freshwater Management 2014 is that regional councils must set freshwater quantity objectives (desired environmental outcomes) and associated freshwater quantity limits for all freshwater management units in a region. Water quantity limits ("environmental flows and/or levels") are a type of limit that describe the amount of water in a freshwater management unit which is required to meet freshwater quantity objectives. A freshwater management unit is defined in the policy statement as a water body, multiple water bodies, or any part of a water body determined by the regional council as the appropriate spatial scale for setting freshwater objectives and limits and for freshwater accounting and management purposes. The concept of freshwater management units was added to the National Policy Statement for Freshwater Management following recommendations of the Land and Water Forum to:[12]

- Encourage a pragmatic approach to freshwater management by allowing water bodies to be grouped together where appropriate;
- Allow a single objective to apply to freshwater bodies that are not connected; and
- Establish a spatial scale at which management activities are undertaken, including freshwater accounting and setting freshwater objectives and limits.

Water quantity limits for rivers must include an allocation limit and a minimum flow (or other flow/s).[13] Minimum flows are set to protect in-stream values, aquatic ecosystems in particular. They are based on the assumption that the less water there is in a water body, the less habitat there is available for aquatic species (for example, plants, invertebrates, and fish) and the increased likelihood of other adverse effects (for example, reduced levels of dissolved oxygen and higher water temperatures). Minimum flows also impact on water users (for example, for irrigation and potable water supplies) but with the opposite impact: the lower the allowable minimum flow the greater the reliability of supply (and vice versa). When a river's flow reduces to the specified minimum, water takes must be restricted so that the flow is not artificially reduced below the minimum

12 *Ministry for the Environment. 2016. A Guide to Identifying Freshwater Management Units Under the National Policy for Freshwater Management 2014. Wellington: Ministry for the Environment.*

13 *"Interpretation", National Policy Statement for Freshwater Management 2014.*

flow. However, minimum flows only maintain the quantity of water left in a water body. They do not regulate the natural flow variability above the minimum flows that are important for ecosystem health, for example by flushing fine sediment, periphyton and other aquatic vegetation, influencing fish migrations and community structure.

Allocation limits are set to cap the amount of water that can be taken from a water body above a minimum flow or level. They ensure that rivers have natural fluctuations in flows and they provide a degree of security of supply for water users. Reliability of supply reduces with increasing allocation and increases the length of time that a water body will be at a minimum flow, which is called "flat-lining". When a flow in a river equals or drops below the management flow (the minimum flow plus the allocation limit) then partial restrictions on takes are meant to occur.

Minimum flows and allocation limits are designed primarily to protect in-stream values and reliability of water supply during normal to low flows (that is, typical high demand periods). Provision can also be made for supplementary (or secondary allocation) during normal (median flows) to high flow periods.

The Regional Water and Soil Plan contains minimum flows for Northland rivers but no allocation limits. This presents risks to existing and new users of water and the health of aquatic ecosystems. While rainfall can be high and water is generally abundant in most areas of Northland, a number of catchments are highly allocated with respect to allocation limits in the Proposed National Environmental Standard on Ecological Flows and Water Levels 2008, and the availability of water is not always reliable during dry periods.

5.2.4 Management options

Rivers

We are proposing to group Northland's rivers into four river water quantity management units:[14]

1) Small rivers;

2) Large rivers;

3) Coastal rivers; and

4) Outstanding rivers.

The first two freshwater management units were determined based on broad differences in their flow regimes and the influence of changes in flow on hydraulic habitat for fish and reliability of supply on water users. The rivers in the large rivers management unit are more reliable and have less reduction in habitat for the same (relative minimum) flow and allocation than the rivers in the small rivers freshwater management unit.

It is useful to note that the amount and quality of habitat at low flow varies with stream size and the flow recession rate and time between high flows. Habitat quality in small streams is often relatively poor at low flows and any further reduction in flow may result in deterioration in habitat quality. In comparison, flow reductions in large rivers will not necessarily result in a decline in habitat quality.

The coastal rivers management unit, which comprises small rivers (mean flow <0.75m^3/s) in catchments close to the coast, was added because of their high native fish diversity. Native fish diversity and densities are often higher in small streams than in larger streams or rivers because the preferred habitat of native fish is usually for relatively shallow water. Moreover, the majority of New Zealand's native fish species are diadromous (that is, they migrate between the ocean and rivers during their life-cycle). This makes coastal stream and river catchments important habitats, and more sensitive to changes in flows by water takes.

The outstanding rivers management unit includes rivers that we consider meet the National Policy Statement for Freshwater Management's definition of outstanding freshwater bodies, and which require a high level of protection. The national policy statement requires regional councils to protect the significant values of outstanding freshwater bodies, which are broadly defined as "those water bodies identified in a regional policy statement or regional plan as having outstanding values, including ecological, landscape, recreational and spiritual values". The rivers identified as outstanding freshwater bodies are afforded protection under the operative Regional Water and Soil Plan.

14 *See Snelder T., 2015. Defining Freshwater Management Units for Northland: A Recommended Approach. Prepared for Northland Regional Council by LWP Ltd., and Osbaldiston S., 2016. Proposed amendments to freshwater management unit boundaries for small and coastal rivers. Northland Regional Council.*

In the remainder of section we identify minimum flow and allocation limit options ("management options") for the region's river water quantity management units. The options allow the council to make informed trade-offs in the interests of striking an appropriate balance between protecting in-stream values and enabling water use. Both primary and supplementary allocations are covered. We have not identified every possible combination of minimum flow and allocation limits (as there are many). Rather, we have identified a range of credible (that is, realistic) options for each freshwater management unit that highlight key differences in approaches.

It is important to note that when setting minimum flows and allocation limits the amount of hydrological variation required to maintain a healthy aquatic ecosystem is not well understood. While we have a reasonably good understanding of the impacts of flow modification on the hydraulic habitat for certain fish specie,s there is still a great deal of uncertainty about other impacts on aquatic ecosystems, for example water quality conditions. Therefore, we took a reasonably approach to identifying management options using best available information.

Generally speaking, high levels of abstraction increase the duration and magnitude of low flows. The greater the duration of low flows, the greater the risk of negative ecological effects. These can include longer accrual periods of periphyton, changes in the relative abundance of fish, shifts in the composition of macroinvertebrates communities, proliferation of macrophytes, and elevated water temperatures and changes in dissolved oxygen dynamics.[15]

It is generally accepted that abstraction (that is, an allocation volume) of more than 40% of mean annual seven-day low flow (MALF)[16] is a high degree of hydrological alteration irrespective of region or source of flow.[17]

Complex and costly methods are often required to justify high allocation limits. Methods include dissolved oxygen and temperature models, flow variability analyses and multi-dimensional hydraulic habitat models. The council has not used these methods to assess the impacts of region-wide allocation limits.

Generally speaking minimum flows are not commonly set lower than 70% of MALF. Flows less than MALF generally occur once every two years on average. Setting minimum flows somewhat less than MALF will result in habitat for aquatic species being maintained at levels that are not too reduced from the natural flow regime. However, a greater reduction relative to MALF is likely to significantly impact on habitat for aquatic species.

Coastal rivers

Coastal rivers have the highest diversity in native fish and typically have the lowest natural reliability due to their small size (mean flow < 0.75m^3/s). For these reasons we propose that minimum flow and allocation limits are set conservatively to protect aquatic ecosystem health and ensure that water availability for use is reliable. For context it may be useful to note that following options are based on increments of 10% of MALF, for both minimum flows and allocation limits.

Option A: adopt the limits in the proposed national standard

The Proposed National Environmental Standard on Ecological Flows and Water Levels 2008 sets out default minimum flow and allocation limits for two types of rivers: those with mean flows less than or equal to 5m^3/s and rivers and streams with mean flows greater than 5m^3/s. The default minimum flow and allocation limits were determined by a group of New Zealand's leading experts and therefore are a credible option and the starting point for all options for each management unit. The proposed national standard recommends the following minimum flow and allocation limit for rivers and streams with mean flows less than or equal to 5m^3/s:

- A minimum flow of 90% of MALF; and
- An allocation limit of 30% of MALF or the total allocation of the catchment (whichever is the greater).

The discussion document about the proposed national environmental standard explains the basis for the limits:[18]

15 *Franklin P., Diettrich J., Booker D., 2015. Options for default minimum flow & allocation limits in Northland. Part 2: Technical report. Prepared for Northland Regional Council. NIWA Client Report No: HAM2013-037.*

16 *MALF is commonly used for setting minimum flow and allocation limits because it is a measure of water availability during dry periods. MALF also standardises minimum flow and allocation by the size of the river.*

17 *Beca Infrastructure Ltd., 2008. Draft Guidelines for the Selection of Methods to Determine Ecological Flows and Water Levels. Report prepared by Beca Infrastructure Ltd. for Ministry for the Environment, Wellington.*

18 *Ministry for the Environment. 2008. Proposed National Environmental Standard on Ecological Flows and Water Levels: Discussion Document.*

The proposed national environmental standard establishes interim limits on alterations to flows and water levels derived from expert scientist and regional council staff experience with many existing environmental flows and water levels. The interim flows and water levels are also intended to accommodate other values, such as recreational, natural character, and cultural flows. While there is some differentiation between river size and groundwater type, the interim limits are generalised across very different water-body types, so they are set at a level that caters for most water bodies.

Option B: adopt the minimum flow limit in the proposed national standard but increase the allocation limit
This option involves adopting a minimum flow of 90% of MALF, consistent with the proposed national standard, but increasing the allocation limit from 30% of MALF to 40%. This means that more water is available for allocation but the risks of adverse effects on aquatic ecosystems increases relative to Option A.

Option C: use a lower minimum flow than the proposed national standard but adopt its allocation limit

This option involves setting a lower minimum flow (80% of MALF) than the minimum flow in the proposed national standard (90% of MALF) but adopting the allocation limit (30% of MALF). This means that the available water is potentially more reliable but the risks of adverse effects on aquatic ecosystems increases relative to Option A.

Option D: use a lower minimum flow and a larger allocation limit than the proposed national standard

This option involves setting a lower minimum flow (80% of MALF) and higher allocation limit (40% of MALF) than those in the proposed national environmental standard. This means that there is more water available for abstraction and the risk of adverse effects on aquatic ecosystems increases relative to Option A.

Small rivers (less than 20m^3/s)

Most of Northland's river network falls within the small rivers water quantity management unit and for the most part have mean flows less than 5m^3/s. These rivers generally have lower in-stream values and higher utility relative to the coastal rivers. That is, they are predominantly located inland within agricultural areas.

Option A: adopt the limits in the proposed national standard

This option involves adopting the following relevant interim limits in the Proposed National Environmental Standard on Ecological Flows and Water Levels:

- A minimum flow of 90% of MALF; and
- An allocation limit of 30% of MALF.

Option B: adopt the minimum flow in the proposed national standard but increase the allocation limit
This option involves adopting a minimum flow of 90% of mean annual low flow, consistent with the proposed national standard, but increasing the allocation limit from 30% of mean annual low flow to 40%. This means that more water is available for allocation but the risks of adverse effects on aquatic ecosystems increases relative to Option A.

Option C: use a lower minimum flow than the proposed national standard but adopt its allocation limit

This option involves setting a lower minimum flow (80% of mean annual low flow) than the minimum flow in the proposed national standard (90% of mean annual low flow) but adopting the allocation limit (30% of mean annual low flow). This means that the available water is potentially more reliable but the risks of adverse effects on aquatic ecosystems increases relative to Option A.

Option D: use a lower minimum flow and a higher allocation limit than the proposed national standard

This option involves setting a lower minimum flow (80% of MALF) and higher allocation limit (40% of MALF) than those in the proposed national environmental standard. This means that there is more water available for abstraction and the risk of adverse effects on aquatic ecosystems increases relative to Option A.

Large rivers (less than or equal to 20m^3/s)

As highlighted earlier, the rivers in the large rivers freshwater management unit (≥20m^3/s) are the least sensitive to hydraulic modification. Accordingly, we recommend more relaxed (that is, less conservative) management options.

Option A: adopt the limits in the proposed national standard

This option involves adopting the following relevant interim limits in the Proposed National Environmental Standard on Ecological Flows and Water Levels:

- A minimum flow of 80% of MALF; and
- An allocation limit of 50% of MALF.

Option B: use a lower minimum flow than the proposed national standard and adopt its allocation limit

This option involves setting a lower minimum flow (70% of MALF) than that recommended in the proposed national standard but adopting its allocation limit (50% of MALF). This means that the available water is potentially more reliable but the risks of adverse effects on aquatic ecosystems increases relative to Option A.

Option C: use a higher minimum flow than the proposed national standard and adopt its allocation limit

The third option is to set a higher minimum flow (90% of MALF) than that recommended in the proposed national standard but adopt its allocation limit (50% of MALF).

Outstanding rivers

A key directive in the National Policy Statement for Freshwater Management is to protect the significant values of outstanding freshwater bodies. The Regional Water and Soil Plan currently identifies seven rivers, or sections of rivers, that have outstanding values and protects them from any significant flow modification. We consider that they should continue to be protected by retaining a minimum flow of 100% of MALF and providing for some minor water allocation (10% of MALF). Abstraction of up to 10% of mean annual low flow is barely measurable and therefore unlikely to result in significant biological effects in any river.[19]

Note that the outstanding rivers are located primarily in native forested areas administered by the Department of Conservation and current demand for water is low and is likely to remain so.

All rivers – supplementary allocation

Minimum flows and allocation limits are generally considered to be sufficient planning tools to protect aquatic ecosystem health and water use. However, as water allocation approaches allocation limits, water storage and flow harvesting (abstracting water during periods of relatively high flow, generally into storage for later use) is increasingly being considered.[20]

There is also a temporal disconnect between water availability and demand for use. Demand normally peaks during summer dry periods but much of the annual discharge from a river occurs during relatively short periods of high flow during winter and spring. Northland experiences high annual rainfall. Consequently, there is potential for harvesting high flows for storage. The volumes that can be harvested vary by location due to variation in rainfall and catchment sizes.

However, it is important to note that flow harvesting ("supplementary allocation") can influence aspects of flow regimes other than low flows[21] and therefore it needs to be managed carefully.

The Regional Water and Soil Plan does not contain any specific provision regarding supplementary allocation. However, the Regional Policy Statement for Northland contains a policy to "Recognise and promote the benefits of water harvesting, storage, and conservation measures."[22] The policy was drafted in recognition that water harvesting, storage, and conservation measures are likely to become increasingly important in Northland as demand for water increases and the local climate changes with longer dry spells and more frequent high intensity rain events. The explanation to the policy also recognises that water storage potentially has other benefits beyond efficient water use, such as buffering storm flows, recharging aquifers, creating habitat for ecological values, and improving recreational opportunities.

19 *Beca Infrastructure Ltd, 2008. Draft Guidelines for the Selection of Methods to Determine Ecological Flows and Water Levels. Report prepared by Beca Infrastructure Ltd for Ministry for the Environment, Wellington.*

20 *Hay J., Kitson J., 2013. Flow Harvesting: A Review of Policy and Potential Effects. Prepared for Environment Southland. Cawthron Report No. 2408.*

21 *Snelder et al., 2013. The role of science in setting water resource use limits: a case study from New Zealand. Hydrological Sciences Journal.*

22 *Policy 4.4.4.*

Consistent with recent advice to Greater Wellington Regional Council[23], we consider that a supplementary minimum flow should be set at the median flow, and supplementary allocation is provided for above the median flow provided:

1) The frequency of flushing flows that exceed three times the median flow of the river is not changed; and

2) 50% of the river flow above the median flow remains in the river.

We consider that supplementary water takes that can be done in accordance with these conditions should be regulated under a restricted discretionary rule, with the matters of discretion being:

- The timing, rate and volume of the take to avoid or mitigate effects on existing authorised takes;
- Preventing fish from entering the water intake; and
- Measures to ensure the reasonable use of water.

Supplementary takes that are unable to be done in accordance with the two conditions should be a discretionary activity.

Lakes and wetlands

Regionally, lakes and wetlands are not typically major sources of water for consumptive uses, although in some areas lakes are important sources. Unlike rivers, there are no readily available tools to assess the impacts of different water quantity limits for multiple lakes.The Proposed National Environmental Standard on Ecological Flows and Water Levels 2008 highlights that a "... common (or standardised) measure of lake size and relative level variation is not available". Therefore, the council is proposing to set minimum levels for lakes based on technical considerations in *Draft Guidelines for the Selection of Methods to Determine Ecological Flows and Water Levels 2008.*[24]

For wetlands the council is proposing to use the default water quantity limit in the Proposed National Environmental Standard on Ecological Flows and Water Levels 2008, which is:

> *No change in water levels, beyond the water level variation that has been provided for by resource consents on the date [the proposed plan is notified].*

The justification for this conservative limit is that wetlands are considered rare and threatened ecosystems[25] and even a small artificial change in water levels can affect their ecosystem values.

Aquifers

The council is proposing to use the recommended limits for managing groundwater resources in the Proposed National Environmental Standards on Ecological Flows and Water Levels 2008 for the default groundwater management units, albeit with a lower allocation limit for coastal aquifers (10% rather than 15% of the annual average recharge):

1) Coastal aquifers: 10% of the annual average recharge; and

2) Other aquifers: 35% of the annual average recharge.

The reason for a lower allocation limit for coastal aquifers (relative to the proposed national limits) is due to the high risk of saline intrusion into many of Northland's small coastal aquifers. Aquifer-specific (that is, tailored) limits are proposed for the aquifers underlying large parts of the Aupōuri Peninsula, and are likely be progressively developed for other key aquifers in Northland.

It is useful to note that there was no specific feedback on the appropriateness of the water quantity limits in the draft regional plan, although the Department of Conservation wanted more information no how the limits will affect river hydrographs to ensure flat-lining over prolonged periods of time is avoided. That matter is addressed below.

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23 *See Memo: Selection of default supplementary allocation criteria for the proposed National Resources Plan. ENV/05/08/12-v1. Greater Wellington Regional Council.*

24 *See Table 3.3 in Beca. 2008. Draft Guidelines for the Selection of Methods to Determine Ecological Flows and Water Levels. Report prepared by Beca Infrastructure Ltd for MfE. Wellington: Ministry for the Environment.*

25 *Ministry for the Environment, 2007. Protecting our Places: Information about the Statement of National Priorities for Protecting Rare and Threatened Biodiversity on Private Land. Wellington, New Zealand.*

5.2.5 High level objectives and measures

Section 32 of the RMA requires an assessment of "*...the efficiency and effectiveness of the provisions in achieving the objectives...*". Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section 1.6 'Evaluation approach' for more details.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against.

We used the Environmental Flow Strategic Allocation Platform model (EFSAP) to assist with identifying and evaluating minimum flow and allocation limit options for Northland's river water quantity management units.[26]

EFSAP helps to characterise the outcomes of different limit options for a specific set of water quantity dependent values. It is important to note that EFSAP only assesses a limited number of attributes (indicators) of aquatic ecosystem health.[27] Table 1 below sets out the objectives and associated measures used in this report for assessing the management options.

Table 1: high level objectives and associated performance measures.

High level objective	Measure
Minimise adverse effects on the health of aquatic ecosystems.	% change in hydraulic habitat for fish species.
	Number of days when flows are around the minimum flow ("flat-lining"): ≥30 days = high degree of alteration. ≥20 days = moderate degree of alteration. ≥10 days = low degree of alteration.
Maximise the reliability water supply.	% time that water is available at the management flow (minimum flow + allocation limit).
	% time that water is available at the minimum flow.

Explanation for the high level objectives and measures

Minimise adverse effects on the health of aquatic ecosystems

Safeguarding the life-supporting capacity of aquatic ecosystems is part of the purpose and principles of the RMA and is a principal objective of the National Policy Statement for Freshwater Management. Change in the hydraulic habitat of fish species is the most widely used indicator or measure for assessing the impacts of different water quantity limits on aquatic ecosystem health. There is generally a mix of fish species in a river. Flow setting processes tend to define a "critical species", which is a species that is considered important or significant for some reason at a location and is sensitive to flow reductions. The assumption is that if the minimum flow is set to maintain the hydraulic habitat for the critical fish species at a specific level then other less critical values, such as other less sensitive fish species, invertebrates and aquatic plants will be maintained

26 *See Franklin P., Booker D., Diettrich J., 2015. Options for default minimum flow & allocation limits in Northland. Part 2: Technical report. NIWA Client Report No: HAM2013-037.*

27 *For an overview of EFSAPs limitations see section 5.3 of Franklin P, Booker D., Diettrich J., 2015. Options for default minimum flow & allocation limits in Northland. Part 2: Technical report. NIWA Client Report No: HAM2013-037.*

by default. Healthy fish populations are also widely identified by communities as an indicator of river health and some species (for example, eels) are important taonga to many Māori.[28] The following table lists the fish species and the reasons why they were used in the evaluation of the options.

The council has not assessed the consequences of different minimum flows and allocation limits on trout and salmon.[29] Northland's rivers do not generally support populations of trout and salmon because of Northland's relatively warm climate and dominant geology types.

Table 2: critical fish species used for assessing the impacts of the management options on aquatic ecosystem health.

River FMU	Critical Fish Species	Note
Coastal rivers and small rivers.	Banded kokopu longfin eels, shortfin eels.	The banded kokopu is representative of fish communities in coastal streams and has fairly high flow requirements. The longfin eel has high conservation value and moderately high flow requirements. Long and short fin eels also have high cultural value.
Large rivers.	Longfin and shortfin eels.	The longfin eel has high conservation value and moderately high flow requirements. Long and short fin eels also have high cultural value.

We also used the number of days of 'flat-lining' as a measure of adverse effects on aquatic ecosystem health. Flat-lining refers to the situation where flows are artificially reduced below the minimum flow for a period of time. Generally speaking, the longer the duration of low flows, the greater the risk of negative adverse effects on aquatic ecosystems. Adverse effects can include a nuisance plant and algal biomass, changes in the relative abundance of fish, changes in the composition of macroinvertebrate communities, elevated water temperatures, and changes in dissolved oxygen levels.[30]

A general rule-of-thumb is that if the duration of low flows (that is, flat-lining) is increased to 30 days or more then the degree of hydrological alteration is high, if it is increased to 20 days or more then it is moderate, and it is increased to 10 days or more then it is low.[31] It is not clear however if the duration of flat-lining is an issue during consecutive days or total days in a year. We have assumed the latter in the interests of being conservative.

Maximise the reliability water supply

When making decisions on minimum flows and allocation limits the council must consider the actual and likely impacts of the reliability of water supply on current and future water users. Generally speaking, reliability decreases with increasing allocation, that is, the higher the allocation the lower the reliability of the water supply.

Reliability of supply is assessed using two measures: (1) the reliability of supply at the management flow,[32] and (2) the reliability of supply at the minimum flow. These two measures refer to the proportion of time that abstractions are partially restricted (in theory by the council) and the proportion of time that no abstraction is possible because the natural flows are at or below the minimum flow, respectively.

28 *See Keir Volkerling, 2015. Northland Tangata Whenua Freshwater Values. Prepared by Keir Volkerling for Northland Regional Council, the Ministry for Primary Industries, and the Ministry for the Environment.*

29 *The RMA requires the council to have particular regard to protection of the habitat or trout or salmon*

30 *See Franklin P, Booker D, Diettrich J, 2015. Options for default minimum flow & allocation limits in Northland. Part 2: Technical report. NIWA Client Report No: HAM2013-037.*

31 *Beca Infrastructure Ltd, 2008. Draft Guidelines for the Selection of Methods to Determine Ecological Flows and Water Levels. Report prepared by Beca Infrastructure Ltd for Ministry for the Environment Wellington.*

32 *The "management flow" refers to when the river's natural flow equals the minimum flow plus the allocation volume (that is, allocation limit).*

The optimum level of reliability of supply differs between water users. For example, drinking water supplies need to be very reliable. However, the council is not aware of any definitive guidance on what constitutes optimum reliability of supply for different uses of water. A recent report on the potential demand and opportunities for water infrastructure in Northland listed the following criteria as a general guide for reliability of supply for irrigation. It is not clear if these apply to the management flow or the minimum flow:[33]

- 100% = very good reliability.
- 94-99% = good reliability.
- 87-94% = marginal reliability.
- <87% = poor or very poor reliability.

The council also has had other expert advice that a reliability of supply of no less than 95% at the minimum flow and at least 90% at the management flow are reasonably conservative water quantity objectives.[34] Ultimately however storing water is the most effective way to achieve a very reliable supply.

High level objectives not included

For the purposes of a default regional water quantity limit the council is concerning itself with two fundamental water quantity-dependent values: the health of aquatic ecosystems and water use. Generally speaking, in managing flows for aquatic ecosystem health other in-stream values (for example, fisheries and natural character) will be provided for. Besides, it is very difficult to quantify or indeed accurately assess the impacts of different minimum flows and allocation limits on other in-stream values, for example, spiritual or aesthetic values. These are best determined at a catchment or sub-catchment level (bearing in mind that Northland has more than 1000 source to sea surface water catchments).

The council has not included an objective on maximising the availability of water because it is implicitly covered in the management options (that is, the management options vary based on the size of the allocation limit).

Section 32 of the RMA requires an assessment of the impacts on economic growth and employment opportunities (s32(2)(a)). However, the impact of the management options on economic growth and employment opportunities cannot be determined with confidence. Therefore, economic growth and employment opportunities have not been included as high level objectives. For more information go to the section 1.7 'Assessing impacts on economic growth and employment opportunities'. It is important to note that placing limits on the ability to access water during normal to low flows or levels will require innovation and more efficient use.

5.2.6 Evaluating the management options

The following tables show the predicted consequences of the management options in terms of the measures for each objective. The consequences are based on 75 percent of all river reaches within each river water quantity management unit. That is, the change in hydraulic habitat and number of days when flows are 'flat-lined' could be greater than shown in the tables could be higher in 25 percent of river reaches in each river management unit. Similarly, the reliability of supply could be lower. The council considers that using 75 percent of all reaches is sufficiently cautious. Note that other other percentiles of reaches (for example, 50%, 80%, or 90%) could be assessed using the "decision space plots" contained in Appendix B of Franklin et al. (2015)[35]. It is also important to note that this analysis does not take into account the effects of lower minimum flow requirements provided for by existing resource consents.

Coastal rivers (note that all figures have been rounded to the nearest integer)

33 *Christ Frost, et al., 2015. Northland Strategic Water Infrastructure Study: Final Draft. Prepared for Northland Regional Council by Opus, BERL, and Aqualinc.*

34 *Ton Snelder, 2015. Defining Freshwater Management Units for Northland: A Recommended Approach. Prepared by LWP Ltd for Northland Regional Council.*

35 *Franklin, P, Booker, D., Diettrich, J. 2015. Options for default minimum flow and allocation limits in Northland. Part 2: Technical report. Prepared for Northland Regional Council. NIWA Client Report No: HAM2013-037 .*

High level objective	Measure	Option A: minimum flow 90% MALF & allocation limit 30% MALF	Option B: minimum flow 90% MALF & allocation limit 40% MALF	Option C: minimum flow 80% MALF & allocation limit 30% MALF	Option D: minimum flow 80% MALF & allocation limit 40% MALF
Minimise adverse effects on the health of aquatic ecosystems.	% change in hydraulic habitat for critical fish species.	-10% banded kokopu -10% longfin eel -10% shortfin eel	-10% banded kokopu -10% longfin eel -10% shortfin eel	-14% banded kokopu -13% longfin eel -14% shortfin eel	-15% banded kokopu -16% longfin eel -16% shortfin eel
	Number of days when flows are around the minimum flow ("flat-lining"): ≥30 days = high degree of alteration. ≥20 days = moderate degree of alteration. ≥10 days = low degree of alteration.	13	18	12	16
Maximise the reliability water supply.	% time that water is available at the management flow (minimum flow + allocation limit).	92%	91%	92%	92%
	% time that water is available at the minimum flow.	95%	95%	95%	95%

Small rivers (note that all figures have been rounded to the nearest integer)

High level objective	Measure	Option A: minimum flow 90% MALF & allocation limit 30% MALF	Option B: minimum flow 90% MALF & allocation limit 40% MALF	Option C: minimum flow 80% MALF & allocation limit 40% MALF	Option D: minimum flow 80% MALF & allocation limit 30% MALF
Minimise adverse effects on the health of aquatic ecosystems.	% change in hydraulic habitat for critical fish species.	-8% banded kokopu -8% longfin eel -8% shortfin eel	-8% banded kokopu -8% longfin eel -8% shortfin eel	-13% banded kokopu -12% longfin eel -13% shortfin eel	-13% banded kokopu -12% longfin eel -13% shortfin eel
	Number of days when flows are around the minimum flow ("flat-lining"):	17	22	21	15

High level objective	Measure	Option A: minimum flow 90% MALF & allocation limit 30% MALF	Option B: minimum flow 90% MALF & allocation limit 40% MALF	Option C: minimum flow 80% MALF & allocation limit 40% MALF	Option D: minimum flow 80% MALF & allocation limit 30% MALF
	≥30 days = high degree of alteration. ≥20 days = moderate degree of alteration. ≥10 days = low degree of alteration.				
Maximise the reliability water supply.	% time that water is available at the management flow (minimum flow + allocation limit).	91%	89%	91%	91%
	% time that water is available at the minimum flow.	94%	94%	95%	95%

Large rivers (note that all figures have been rounded to the nearest integer)

High level objective	Measure	Option A: minimum flow 80% MALF & allocation limit 50% MALF	Option B: minimum flow 70% MALF & allocation limit 50% MALF	Option C: minimum flow 90% & allocation limit 50%
Minimise adverse effects on the health of aquatic ecosystems.	% change in hydraulic habitat for critical fish species.	-4% longfin eel -5% shortfin eel	-6% shortfin eel -7% longfin eel	-3% shortfin eel -3% longfin eel
	Number of days when flows are around the minimum flow ("flat-lining"): ≥30 days = high degree of alteration. ≥20 days = moderate degree of alteration. ≥10 days = low degree of alteration.	31	28	35
Maximise the reliability water supply.	% time that water is available at the management flow (minimum flow + allocation limit).	85%	87%	83%
	% time that water is available at the minimum flow.	94%	95%	92%

Outstanding rivers (note that all figures have been rounded to the nearest integer)

High level objective	Measure	Minimum flow 100% & allocation limit 50%
Minimise adverse effects on the health of aquatic ecosystems.	% change in hydraulic habitat for critical fish species.	-3% banded kokopu -3% longfin eel -4% shortfin eel
	Number of days when flows are around the minimum flow ("flat-lining"): ≥30 days = high degree of alteration. ≥20 days = moderate degree of alteration. ≥10 days = low degree of alteration.	5
Maximise the reliability water supply.	% time that water is available at the management flow (minimum flow + allocation limit).	92%
	% time that water is available at the minimum flow.	94%

Certainty about the evaluation

The council is reasonably certain about the predicted impacts of the different management options in terms of the measures used, but less so about what constitutes a tolerable (or conversely unacceptable) level of impact on aquatic ecosystems. For example, the council can predict changes to the hydraulic habitat of fish but do not know a 'tipping' point for a loss of a fish community (if one exists). Similarly, the council can predict the impacts of the management options on the reliability of supply for water users but lack the information to determine optimum levels for different water users.

Our ability to predict the impact of the management options on other aspects of aquatic ecosystem health (for example, water quality) is limited in the absence of detailed investigations. However, this was acknowledged previously and we addressed it by only considering allocation limits that generally met hydrological 'rules-of-thumb' and excluding options that needed to be underpinned by detailed and complex assessments.

These uncertainties can be addressed in time by way of detailed ecological flow assessments and tools for assessing the economic implications of various flow regimes. This may be done over time, starting with rivers that are highly allocated.

Time-frame of the evaluation

The time-frame for this evaluation is the life of the plan (approximately 10-15 years).

The preferred management options

Rivers

Our preferred management options are set out in the following table. We think that it important to apply a high level of protection for outstanding rivers and slightly lesser degree of protection for coastal rivers for reasons stated earlier. Option C for small rivers provides the best balance between enabling resource use and safeguarding the life-supporting capacity of aquatic ecosystems. While Option B for large rivers scores better for three out of four measures we are hesitant to adopt it because of potential adverse effects on water quality (dissolved oxygen and temperature) during summer low flow periods. As such, we are proposing to adopt the relevant limits in the Proposed National Environmental Standard on Ecological Flows and Water Levels.

Freshwater Management Unit	Minimum flow (% of mean annual low flow)	Allocation limit (% of mean annual low flow)
Outstanding rivers	100%	10%
Coastal rivers	90%	30%
Small rivers	80%	40%
Large rivers	80%	50%

Where current allocation from a river (or lake, weland, or aquifer) exceeds an allocation limit then the council is proposing to cap the total allocation at the current level until such time as work is done to justify a higher or lower allocation limit (either through a plan change or resource consent application). This same principle also applies to water bodies that have lower minimum flows or levels provided for by way of resource consents.

Lakes

The council proposes to set minimum levels for Northland's lakes to ensure that there is no more than a low risk of hydrological change in them. The minimum levels are based on technical considerations in *Draft Guidelines for the Selection of Methods to Determine Ecological Flows and Water Levels,*[36] and are as follows:

Freshwater Management Unit	Minimum Level
Deep lakes (>10m)	Less than 0.5m change to median lake level, less than 10% change in mean annual lake level fluctuation and patterns of lake level seasonality (relative summer vs. winter levels) remain unchanged from the natural state.
Shallow lakes (<10m)	Less than 10% change in median lake level, less than 10% change in mean annual lake level fluctuation and patterns of lake level seasonality (relative summer vs. winter) remain unchanged from the natural state.

Wetlands

The council proposes to use the default water quantity limit in the Proposed National Environmental Standard on Ecological Flows and Water Levels 2008, which is:

> *No change in water levels, beyond the water level variation that has been provided for by resource consents on the date [the proposed plan is notified].*

The justification for this conservative limit is that wetlands are considered rare and threatened ecosystems[37] and even a small artificial change in water levels can affect their ecosystem values.

36 *Beca. 2008. Draft Guidelines for the Selection of Methods to Determine Ecological Flows and Water Levels. Report prepared by Beca Infrastructure Ltd for MfE. Wellington: Ministry for the Environment*

37 *Ministry for the Environment, 2007. Protecting our Places: Information about the Statement of National Priorities for Protecting Rare and Threatened Biodiversity on Private Land. Wellington, New Zealand.*

Aquifers

The council also proposes to use the recommended limits for managing groundwater resources in the Proposed National Environmental Standards on Ecological Flows and Water Levels 2008 for the default groundwater management units, albeit with lower limit for coastal aquifers (10% rather than 15%) because several are at risk of saline intrusion:

1) Coastal aquifers: 10% of the annual average recharge; and

2) Other aquifers: 35% of the annual average recharge.

Aquifer-specific (that is, tailored) limits are proposed for the aquifer system underlying large parts of the Aupōuri Peninsula, and may be progressively developed for other key aquifers in Northland. Developing aquifer-specific allocation limits requires detailed conceptual and numerical models underpinned by good information on the resource. This takes time and significant resource, which is why we have prioritised our efforts on high valued aquifers.

5.3 Taking and use of fresh water

5.3.1 Executive summary

This evaluation looks at options (rules and associated policy) for managing the taking and use of fresh water. The relevant Proposed Regional Plan provisions are:

- Rules C.5.1.1 - C.5.1.13
- Policies D.4.18 - D.4.24

Section 14 of the RMA states that the taking, use, damming and diversion of fresh water is not allowed unless authorised by a national environmental standard, a rule in a regional plan as well as a proposed regional plan, or a resource consent, or the taking is for a person's reasonable domestic needs or the reasonable needs of a person's animals for drinking water, or for firefighting purposes. It is important to note that the taking of water for a person's reasonable domestic or for the needs of a person's animals for drinking water is not unfettered: The RMA is clear that fresh water can only be taken for these uses if it does not, or is not likely to, have an adverse effect on the environment.

The council currently regulates the taking and use of water by way of rules in the Regional Water and Soil Plan. Overall, the rules have worked well but the recent review of the plan identified several issues that need to be addressed, including the need to improve our information on the location and amount of water takes, avoid over-allocation, and encourage the efficient use of water.[38]

We are proposing to include new and amended provisions in the Proposed Regional Plan. They are summarised as follows.

1) Permitted activity rules for the following activities:
   a) the taking of small volumes of fresh water from a river, lake or aquifer (1 cubic metre per property from a coastal aquifer and 10 cubic metres or 200 litres per hectare up to a maximum of 20 cubic metres per property from all other water bodies);
   b) the temporary taking of fresh water for road construction, road maintenance, and dust suppression;
   c) the taking of fresh water from an off-stream dam;
   d) the taking of fresh water from an artificial water course; and
   e) the taking of fresh water from ground water associated with bore development, bore testing or dewatering.
2) Controlled activity rules for:
   a) the replacement (that is, re-consenting) of an existing resource consent for a non-consumptive take or a registered drinking-water supply; and
   b) takes not authorised at the notification date of the plan and not permitted by rules in the new regional plan, and that do not exceed exceed 50 cubic metres per day.
3) Restricted discretionary activity rule for the taking of from a river when its flows are above its median flow (supplementary allocation) and which is not permitted by another rule.
4) Discretionary activity rule for takes not authorised at the notification date of the plan and that exceed 50 cubic metres per day.
5) Non-complying activity rules for:
   a) the taking of water from a river, lake or natural wetland when the flow in the river or water level in the wetland or lake is below a minimum flow or water level, or which would cause flows or levels to be reduced below a minimum flow or water level; and
   b) the taking and use of water from a fully allocated river or aquifer or that would exceed the allocation limit for the river or aquifer by more than 10% of the seven-day mean annual low flow (rivers) or five percent of the annual average recharge (aquifer).

38 See www.nrc.govt.nz/Your-Council/Council-Projects/New-Regional-Plan/10-year-review-of-the-regional-plans

6) Prohibited activity rule for the taking and use of water from a fully allocated river or aquifer that would exceed the allocation limit for the river by more than 10% of the seven-day mean annual low flow or allocation limit for an aquifer by more than 5% of the annual average recharge.

7) A policy on exceptions to minimum flows or water levels. That is, an application for a water permit that would authorise water to be taken from a river, lake or natural wetland when flows or levels are below a minimum flow or level will generally not be granted. A resource consent may be granted if a different minimum flow or level is set for the water body or if the water is to be taken for the following uses:

   a) water for the health of people as part of a registered drinking water supply; or

   b) water required for the sole purpose of preventing the death of permanent viticulture or horticulture crops (excluding pasture species, animal fodder crops, and maize).

8) Policies on reasonable and efficient use of water.

9) A policy on conditions on water permits (resource consents for the taking and use of fresh water).

10) A policy on the transfer of water permits.

We consider that it is not necessary to include rules in the new plan for the taking and use of water for an person's reasonable domestic needs or the reasonable domestic needs of an person's animals for drinking water. This continues the current approach under the Regional Water and Soil Plan. That is to rely on Section 14(3)(b) of the RMA which allows such takes provided, however, that the taking or use does not have an adverse effect on the environment[39].

We consider that our proposal strikes an appropriate balance (that is, trade-off) between the ability of council to control actual and potential adverse effects of water takes on the environment and enabling resource use.

5.3.2 Relevant provisions

This evaluation supports the following regional plan provisions:

- Rules C.5.1.1 - C.5.1.13
- Policies D.4.18 - D.4.24

5.3.3 The problem, opportunity and/or requirement

The purpose of this evaluation is to determine the most appropriate set of rules and associated policies for managing the taking and use of fresh water pursuant to the council's responsibilities and functions under the RMA. It should be read in conjunction with the evaluation of freshwater quantity objectives and limits (5.2 'Freshwater quantity objectives and limits').

The default setting under Section 14 of the RMA is that the taking and use (as well as damming and diversion) of fresh water is not allowed unless authorised by a national environmental standard, a rule in a regional plan or a proposed regional plan, or a resource consent (a water permit). Unless, however, the taking and use of water is for a person's reasonable domestic needs or the reasonable needs of a person's animals for drinking water, or is for firefighting purposes. It is important to note though that the taking of water for a person's reasonable domestic needs or the reasonable needs of a person's animals for drinking water is not unfettered. The RMA is clear that the taking or use can only occur if it does not, or is not likely to, have an adverse effect on the environment.

Currently the council regulates the taking and use of fresh water by way of rules and policies in the Regional Water and Soil Plan for Northland. The plan permits minor surface water takes subject to conditions including maximum daily volumes. Water takes that are not permitted are generally discretionary or non-complying activities. The plan does not prohibit any water takes.

Overall, the water quantity management rules in the Regional Water and Soil Plan have worked well but a recent review of the plan identified the following key issues that need to be addressed:[40]

39 *The RMA broadly defines the term environment to include: (a) ecosystems and their constituent parts, including people and communities; (b) all natural and physical resources; (c) amenity values; and (d) the social, economic, aesthetic, and cultural conditions which affect the matters stated in (a) to (c) or which are affected by those matters.*

40 *See www.nrc.govt.nz/Your-Council/Council-Projects/New-Regional-Plan/10-year-review-of-the-regional-plans*

1) It does not contain any rules that regulate the taking of water for reasonable domestic needs and the reasonable needs of a person's animals for drinking water (often called RMA s14(3)(b) takes). These takes are allowed by the RMA provided that they do not cause any adverse effects on the environment. There is a likelihood however that such takes individually or cumulatively have adverse effects on the environment in some areas and consequently may be in breach of the RMA.
2) The appropriateness of the current maximum daily volumes in the permitted activity rules: it is not clear if they are too restrictive (that is, environmentally protective) or conversely not restrictive enough.
3) The requirement to give effect to the National Policy Statement for Freshwater Management (NPS-FM), including:
   a) Avoiding over-allocation, [41] the situation where (a) water has been allocated to users beyond a limit, or (b) is being used to a point where a freshwater quantity objective is no longer being met. The new regional plan will contain water quantity limits (that is, minimum flows and levels and allocation limits) that must be observed; and
   b) Improving and maximising the efficient allocation and use of water,[42] including by stating criteria by which applications for approval of transfers of water permits are to be decided
4) The council's understanding of actual water use (spatial and temporally) needs to improve, particularly in light of new national policy requirements (see below). While we know how much water has been allocated by water permits we do not have good information on how much is actually being taken and used. For permitted and unauthorised takes we estimate use based on likely water use for different land activities. Better information about actual water used in Northland is need to:
   a) Inform decisions on the setting and reviewing of water quantity objectives and limits;
   b) Provide information to investors about catchments with regards to how much water is available for use and where constraints exist for further development;
   c) Protect existing users from reductions in reliability associated with potential new and increased takes; and
   d) Provide feedback to communities on progress against objectives and as a trigger for any needed changes in management practices.

The National Policy Statement for Freshwater Management requires regional councils to establish and operate a freshwater quantity accounting system. The policy statement defines a "freshwater quantity accounting system to mean:

> *"...a system that, for each freshwater management unit, records, aggregates and keeps regularly updated, information on the measured, modelled or estimated:*
>
> *a) total freshwater takes;*
>
> *b) proportion of freshwater taken by each major category of use; and*
>
> *c) where limits have been set, the proportion of the limit that has been taken."*

A freshwater quantity accounting system must therefore quantify the amount of water taken. This includes water taken under a water permit (both the total amount allocated within the consent and the amount of water that is actually taken), as well as any takes that are permitted or do not require a water permit.

It is useful to note that water use is usually significantly less than the amount allocated by water permits (also known as 'paper allocation'). There are reasons for this including provision for worst-case drought conditions or additional water for future expansion of the operation for which water is needed, and conditions in water permits that do not accurately specify the timing, rates, and volumes. Often the paper allocation is never used and this effectively prevents other water users from efficiently getting access to the water.

The Resource Management (Measurement and Reporting of Water Takes) Regulations 2010 specifies that all water permits that allow fresh water to be taken at a rate of five (5) litres per second (L/s) or more be metered and water use records provided to council. Costs associated with this requirement are not assessed in this evaluation. We have only included the costs associated with metering smaller takes (<5L/s).

In Northland takes of less than 5L/s can be significant due to the relatively small size of the majority of the region's rivers: Northland has approximately 18,000km of rivers and streams, of which approximately 70 percent of the rivers and streams have a mean annual low flow of less than 10 litres per second and 55 percent have a mean annual low flow of 5L/s. This

41 *See Objective B2 and Policy B5, NPS-FM.*
42 *See Objective B3 and policies B2, B3, and B5.*

illustrates that takes of less than 5L/s can be large takes relative to the size of the majority of the region's rivers and streams. Metering of water takes is the best tool to get accurate information on water use. The alternative option is to estimate water use using models with variables such as land use and climate, but this is typically less accurate.

Before we look at the options for managing the taking and use of freshwater, it is useful to consider the main uses of water in Northland the volumes allocated to each. Figure 1 below shows our current understanding of how much water taken, but not necessarily used, in Northland (consented, estimated permitted stock drinking, and estimated unauthorised dairy shed use[43]). Water taken directly from water bodies for domestic use outside of urban areas is minor and has not been included in the graph. The graph highlights that at a regional level water taken for stock drinking, dairy shed use, and other minor uses is small relative to the amount of water taken for irrigation and municipal supplies.[44] However, it is important to note that this allocation situation differs between catchments. For example, in some catchments the amount of water taken for stock drinking and dairy shed use is significantly higher than the regional average. Figure 2 shows how much water is authorised by resource consents to be taken. It shows that most water is taken to supply urban areas and for irrigation.

Figure 1: water allocation by use (January 2016)

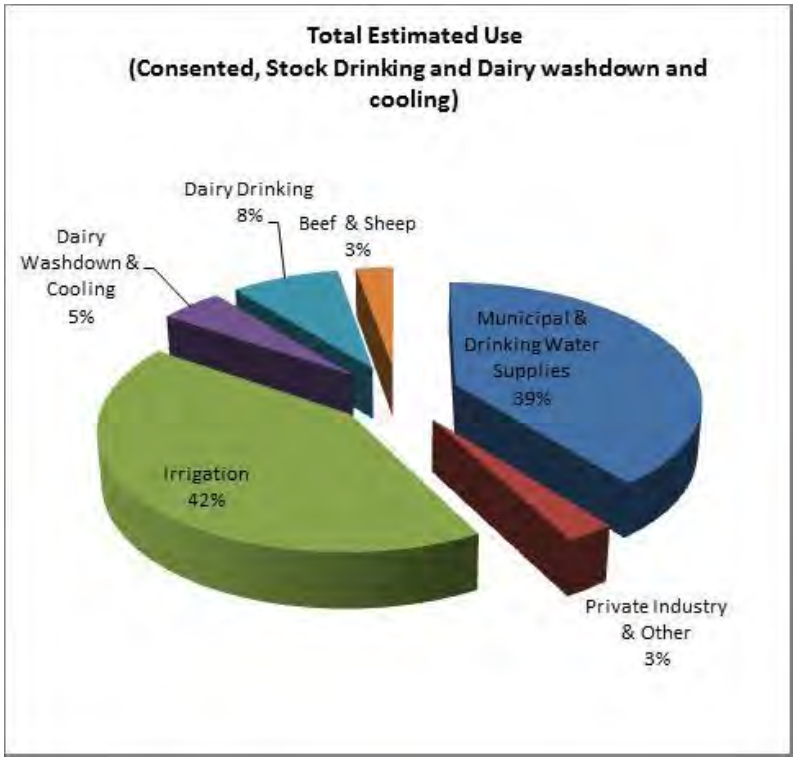
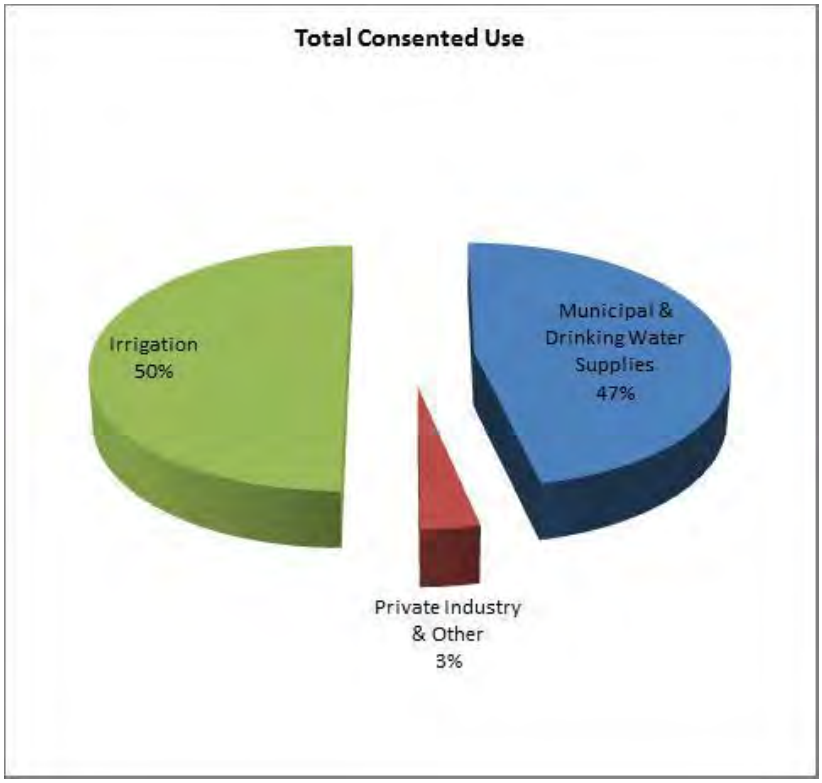


Figure 2: consented allocation (January 2016).

43 *Unauthorised dairy shed use refers to water that is taken but not permitted by a rule in the Regional Water and Soil Plan or resource consents.*

44 *Note that the stock drinking component is based on each animal drinking 120 litres per day, which is conservative, and dairy shed use is based on 70 litres per cow per day.*



5.3.4 Management options

Water takes for reasonable domestic needs and stock drinking needs

We have identified three management options for the taking and use of water for a person's reasonable domestic needs or the reasonable needs of a person's animals for drinking water ("RMA s14(3)(b) takes"). They are summarised below.

Option A: do not include a rule in the plan for RMA s14(3)(b) takes

The first option is to maintain the status quo, which involves not having a rule for RMA s14(3)(b) takes.

Option B: expressly permit RMA s14(3)(b) takes in the plan

The second option is to include a permitted activity rule in the new regional plan for RMA s14(3)(b) takes. Conditions of the rule would include maximum permitted volumes, the design of the intake structure to protect fish, a requirement to avoid adverse effects on other authorised takes, and a requirement to register the takes with the council. The latter would allow the council to better understand water is taken across the region and to ensure that the reliability of the takes are adequately protected.

Option C: require RMA s14(3)(b) takes to be authorised by resource consents

The third option is to regulate RMA s14(3)(b) takes by way of resource consents under a controlled activity rule, which means that resource consents must be granted but the we would have the ability to manage the takes on a case-by-case basis. That is, conditions of consents would be tailored to nature of the take, and may include takes to be metered (if the takes are large).

Other minor takes

In this context the term minor takes refers to the extraction of water from water bodies at a low pumping rate over a long period of time or a high pumping rate for very short periods of time. Although what is deemed minor is relative to the size of the water body and the amount of demand on it. Examples of minor takes include small scale irrigation and some dairy shed wash down and cooling uses, and temporary takes (for example, road construction and maintenance activities). Generally

such takes, individually and cumulatively, do not cause significant changes to flows and water levels. However, this can depend on the nature of the activity, the size of the water body and the level of water use demand pressure. For example, coastal and small inland streams and shallow coastal aquifers in particular can be impacted by minor takes.

We need to determine if the current permitted activity rules for minor takes are still appropriate for managing adverse effects on the environment (for example, aquatic ecosystems and other water users). In other words, we needs to strike a balance between minimising costs of accessing fresh water and ensuring that actual and potential adverse effects on the environment are adequately avoided, remedied or mitigated.

Option A: retain current permitted activity rules for minor takes (the status quo)

The first option is to retain the current rules that permit the taking and use of water from most water bodies[45] subject to conditions, including that the total take from most surface waters does not exceed 30 cubic metres per day during the period 1 June to 30 November or 10 cubic metres per day during the period of 1 December to 31 May. For some rivers however the rules restrict the maximum take to 100 cubic metres per week [46]. The plan also permits the taking and use of up to 10 cubic metres of groundwater per day, unless the groundwater is in an aquifer with high actual or potential demand, an aquifer at risk of saline intrusion or a geothermal aquifer. In which case the activity is a discretionary activity.

The permitted activity rules also include other conditions, including:

- The design of the intact structure in surface water bodies to prevent adverse effects on fish;
- A requirement to provide the council with water use information on request;
- A requirement to keep the reticulation system in good working order to minimise leakage and wastage; and
- That the take and use of water does not limit or prevent the ability of an existing lawful water user to take water.

Option B: simplify and amend the permitted activity rules for minor takes using information on water availability

The second option is to retain a permitted activity status for minor takes subject to amended conditions. They include the maximum daily volumes per property that can be taken from all sources (rivers, lakes and aquifers), with the exception being natural wetlands given their high value and sensitivity. A water take a from wetland would required to be authorised by resource consent.

To determine an appropriate maximum permitted volume(s) we considered approaches taken by other councils and the need to ensure that the volume(s) are underpinned by science (rather than subjectivity). The following table sets out the volumes permitted to be taken by other regional councils. Volumes range from five cubic metres per day to 100 cubic metres per day (excluding West Coast Regional Council for obvious reasons) but generally speaking the average volume is around 20 cubic metres per day per property.

Region	Lake	River	Aquifer
Auckland	20m^3/day	5m^3/day	5m^3/day (when averaged over any consecutive 20-day period) 20m^3/day (when averaged over any consecutive five-day period) and no more than 5000m^3/year
Waikato	1.5m^3/day on sites (a property) equal to or less than one hectare 15m^3/day on all other sites		1.5m^3/day on sites (a property) equal to or less than one hectare 1.5m^3/day on sites where the well is in 600m of the coastal marine area

45 *The taking and use of water from a significant indigenous wetland, a listed dune lake, or an outstanding freshwater body is not permitted.*

46 *Rule 24.1.2, Regional Water and Soil Plan.*

Region	Lake	River	Aquifer
			15m^3/day on all other sites
Bay of Plenty	15m^3/day per property		15m^3/day where the property is less than 5 hectares 35m^3/day where the property is equal or greater than 5 hectares
Gisborne	10m^3/day		10m^3/day
Hawkes Bay	20m^3/day per property		20m^3/day per property
Taranaki	50m^3/day per property		50m^3/day per property
Horizons	400l/ha/day up to 30m^3/day per property for animal farming 15m^3/day for other uses		400l/ha/day up to 50m^3/day per property for animal farming 50m^3/day for other uses
Greater Wellington	10m^3/day per property that is less than 20ha 20m^3/day per property that is greater than 20ha		10m^3/day per property that is less than 20ha 20m^3/day per property that is greater than 20ha
Malborough	Ranges from 5-15m^3/day per property depending on the use		Ranges from 5-15m^3/day per property depending on the use
Tasman	Ranges from 5-20m^3/day per property depending on the location		Ranges from 5-20m^3/day per property depending on the location
Canterbury	Ranges from 2-100m^3/day per property depending on the nature and size of the water body		10m^3/day per property that is less than 20ha 100m^3/day per property that is greater than 20ha
Otago	25m^3/day per property		25m^3/day per property
Southland	2000L/day, plus 250L per hectare per day, up to a maximum of 40m^3/day per property		86m^3/day per property (a maximum of 86m^3/day of groundwater and surface water combined per landholding per day is allowed)
West Coast	1,500m^3/day per property from large rivers		50m^3/day per property

Region	Lake	River	Aquifer
	25m^3/day per property from small rivers		

Second, we determined water yields from land (cubic metres per hectare) in approximately 1700 surface water catchments in the region during one in seven-day mean annual low flow conditions (mean annual low flow). The mean annual low flows were based on a combination of modelled and measured flows. We focused on baseflow conditions because that is when water is normally in most demand and it is what allocation limits and minimum flow limits are based on. We calculated the water yields by:

1) Multiplying the mean annual low flow (expressed as litres per second) at the bottom of each catchment by the time in a day (86,400 seconds) to determine the total daily discharge;
2) Multiplying the total daily discharge by an allocation limit of 30 percent of the mean annual low flow (the 30 percent allocation limit is based on the allocation limit for coastal rivers, but a larger allocation limit could be used);
3) Removing the estimated allocation for stock drinking water and domestic use (outside of areas serviced by town supplies), estimated dairy shed use and consented water; and
4) Convert the adjusted volumes to volumes per hectare.

The results are set out in the following table. The statistics are the mean, median, and percentiles of the available allocation of the 1,700 surface water catchments in the region. Catchment geology is the main reason for the range of baseflow yields.

Statistic	Total available allocation with stock and domestic takes removed (m^3/ha/day)	Total available allocation with stock and domestic takes, dairy shed use and consented takes removed (m^3/ha/day)
Mean	0.474	0.428
10thpercentile	0.161	0.116
20thpercentile	0.238	0.203
30thpercentile	0.291	0.268
40thpercentile	0.349	0.324
Median	0.414	0.389
60thpercentile	0.489	0.466
70thpercentile	0.585	0.565
80thpercentile	0.689	0.671
90thpercentile	0.844	0.816

Based on this work, we suggest for this option that the maximum permitted daily take from a river, lake or aquifer (excluding a coastal aquifer) is either 10 cubic metres per property (consistent with the existing rule) or 200 litres per hectare, up to a maximum of 30 cubic metres per property. The 200 litres is based on the lower end of the water yield spectrum across Northland during the seven day mean annual low flow conditions (around the 20th percentile of catchments). The maximum volume of 30 cubic metres is based on the winter and autumn (1 June - 30 November) permitted water take volume in the Regional Water and Soil Plan for Northland.

The other main changes to the status quo are:

- Requiring that permitted activity takes comply with freshwater quantity limits (minimum flows/levels and allocation limits);
- Requiring smaller mesh sizes for intake structures, consistent with recent technical guidelines;[47] and
- Providing the council with the ability to require (on a case-by-case basis) that water meters are installed and water use recorded, for example, in a highly or fully allocated catchment.

Option C: require all takes to be authorised by resource consents

This option involves regulating all minor takes by way of a controlled activity rule. In other words, classify takes of water less than the maximum volumes in Option B are a controlled activity. Section 87A(2) of the RMA states that if an activity is described as a controlled activity a resource consent is required for the activity and the consent authority must grant a resource consent. However, the council has the power to impose conditions on the resource consent in respect of matters which it has reserved control of in the plan. The suggested matters of control are:

- The timing, rate, and volume of the water take, including to meet water quantity limits;
- The location and design of the intake structure;
- Efficiency measures; and
- Avoiding, remedying and mitigating adverse effects on aquatic ecosystems and other water users.

The activity status of larger water takes where water is available for extraction

The NPS-FM establishes a framework for managing water allocation within limits. We considered two options for managing the taking and use of larger volumes of water (not minor takes) where it is available as part of an allocation limit. The proposed allocation limits are designed to protect, at a freshwater management unit (regional) scale, the health of aquatic ecosystems, the reliability of water supplies, and culturally important fish species. However they are not specifically tailored to individual reaches. In other words, they are designed to establish a minimum level of protection for rivers and aquifers at a regional scale but do not necessarily take into account localised water quantity dependent values.

Option A: controlled activity status

This first option is to manage the taking of water where it is available as part of an allocation limit under a controlled activity rule. The matters of control to avoid or mitigate adverse effects on the environment are:

- The timing, rate, and volume of the water take;
- The location and design of the intake structure; and
- The efficiency measures.

Option B: discretionary activity status

The other option is to specify that the taking of water that is available as part of an allocation limit is a discretionary activity. Section 87A(4) of the RMA states that if an activity is described as a discretionary activity, a resource consent is required for the activity and the council may decline the consent or grant the consent with or without conditions. This would provide the council with the ability to decline an application for a water take if it is likely it will result in significant adverse effects that cannot be avoided, remedied or mitigated, despite the water being available as part of a limit.

47 *Jamieson, D., Bonnet, M., Jellman, D., Unwin, M. 2007. Fish screening: good practice guidelines for Canterbury. Prepared for Environment Canterbury, Fish & Game New Zealand, Irrigation New Zealand, and Department of Conservation. NIWA Client Report: CHC2007-092.*

The activity status for transfers of water permits (resource consents to take and use water)

Section 136(2) of the RMA provides for the transferring of a water permit for the taking or use of water to another person on another site, or to another site, if both sites are in the same catchment (either upstream or downstream), aquifer, or geothermal field, and the transfer:

- Is expressly allowed by a regional plan; or
- Has been approved by the council (as part of a resource consent application process).

Section 136(4) sets out the approach by which applications for a consent authority's approval of transfer are to be made and considered. It states that an application for a transfer is to be considered in accordance with certain other sections of the RMA that apply to resource consent applications generally, and also that the consent authority is to have regard to the effects of the proposed transfer, including the effect of ceasing or changing the exercise of the permit under its current conditions and the effect of allowing the transfer. On the face of it rules to govern an application for a transfer are not needed in a plan. However case law has established that a regional plan can classify transfers of water permits as permitted activities or other types of activities.*Carter Holt Harvey v Waikato Regional Council* [2011] NZEnvC 380 [456].

The NPS-FM requires regional councils to include criteria in their regional plans by which applications for approval of transfers of water permits are to be decided. The criteria could be the conditions of a rule or a policy that directs decisions on resource consent applications. Note that transfers are only likely to occur when a water body is fully allocated. Three options for criteria are summarised below.

Option A: permitted activity

The first option is to permit the transfer of water permits subject to a condition(s), including that the water transfer must not result in any new or increased adverse effects on aquatic ecosystems, other beneficial values of water or on other users. These conditions are required because moving the location of the water take above or below the existing point of take has the potential to cause new or increase adverse impacts.

Option B: controlled activity

The second option is to specify that transfers of water permits to take or use water are a controlled activity, meaning that the council could not decline an application for a transfer but its power to impose conditions on the resource consent is restricted to matters over which the control is reserved. The suggested matters of control would relate to avoiding or mitigating any new adverse environmental effects are as follows:

- The timing, rate, and volume of the water take;
- The location and design of the intake structure; and
- Efficiency measures.

Option C: policy direction only

The third option is to not include any rules in the new plan for regulating transfers of water permits but include a policy with criteria by which applications for approval of transfers of water permits are to be decided. Under this approach applications would be governed by Section 136(4) of the RMA and would be treated as a discretionary activity. That is, the council could accept or decline applications for transfers.

The activity status of a water take that will exceed an allocation limit

The NPS-FM states that regional councils must "[ensure] that no decision will likely result in future over-allocation – including [by] managing fresh water so that the aggregate of all amounts of fresh water in a freshwater management unit that are authorised to be taken, used, dammed or diverted does not over-allocate the water in the freshwater management unit."[48] The policy statement defines over-allocation as the situation where water (a) has been allocated to users beyond a limit, or (b) is being used to a point where a freshwater objective is no longer being met.

On the face of it the direction is clear: the taking (or using, damming, and diversion) of freshwater that will cause a water quantity limit to be exceeded or an objective compromised must not be allowed (that is, in RMA terms prohibited).

48 *Policy B5*

While this would be a prudent course of action when the limits and/or objectives were specifically defined with best available science for a water body, prohibiting water takes may be unreasonably restrictive for several reasons. First, the proposed allocation limits are designed to protect fish species that are sensitive to hydrological modification (and by proxy the health of other fish and invertebrate species), prevent flat-lining of rivers for extended periods of time, and to ensure water is very reliable. However it stands to reason that there will be some water bodies that may not have any sensitive fish species in them or are not susceptible to adverse effects associated with longer periods of flat-lining. In addition a lower level of reliability may not be an issue in some areas. In such cases it may be appropriate to authorise a greater allocation or allow a lower minimum flow or level than the default regional scale limits in the plan.

Adopting a hardline position would mean that a person wanting access to water that is not available as part of the default allocation limit would have to either initiate a private plan change, wait for one to occur, or find an alternative source (including flow harvesting). This would not be an incentive to instigate a fall data gathering and analysis process to improve information on the impacts of further hydrological modification on aquatic ecosystems and other values because the costs of a private plan change can be significant.[49] It would also be prohibitively expensive for many people.

We think that it is not realistic to require certain takes to cease once a flow in a river reaches a minimum flow or a water level in a lake. Specifically, it may be unaffordable for a district council to provide highly reliable water to a town during drought periods and the only feasible option is to take water below a minimum flow. Similarly, water is sometimes needed during significant droughts to prevent the death of permanent viticulture or horticulture crops. It may not be possible to store water for these infrequent occurrences.

Therefore we are proposing to include non-complying and prohibited activity rules in the plan. A non-complying activity rule would be for the taking of water from a river, lake or natural wetland when the flow in the river or water in the natural wetland or lake is below a minimum level. An associated policy would be included in the plan specifying that an application for a water permit that would authorise water to be taken from a river, lake or natural wetland when flows or levels are below a minimum flow or level will generally not be granted. A water permit may be granted if:

1) The water is to be taken for:
   a) the health of people as part of a registered drinking water supply; or
   b) the sole purpose of preventing the death of permanent viticulture of horticulture crops (excluding pasture species, animal fodder crops, and maize); or

2) A different minimum flow or level has been set for the water body in a resource consent.

An additional non-complying rule would be included in the plan for the taking and use of water from a fully allocated allocated river or aquifer or which would exceed the allocation limit for the river or aquifer provided the take does not exceed:

1) The allocation limit by more than 10% of the seven-day mean annual low flow, or

2) An allocation limit for a river by more than 5% of the seven-day mean annual low flow.

This rule would provide some tolerance around the allocation limits to account for situations where a higher allocation limit may be appropriate, but would still require applicants to satisfy Section 104D of the RMA.

Finally, the plan would state that the taking and use of water that would cause any of the following situations is a prohibited activity:

1) A catchment-specific allocation limit to be exceeded;

2) A default allocation limit for a river to be exceeded by more than ten percent of the seven-day mean annual low flow; or

3) A default allocation limit for an aquifer to be exceeded by more than five percent of the annual average recharge.

Water takes from artificial water courses and off-stream dams

We are proposing to continue to permit the taking of fresh water from artificial watercourses subject to the following conditions:

- The activity must not limit or prevent any existing lawful user from being able to take water;
- Artificial water courses must not be connected upstream to a river, lake or natural wetland; and
- The activities must not change the water level in a natural wetland or lake, or affect flows in associated rivers.

49 *See section 5.3.2 of Ministry for the Environment, 2008. Proposed National Environmental Standard on Ecological Flows and Water Levels: Discussion Document. Ministry for the Environment. Wellington, New Zealand.*

The activities are unlikely to have adverse effects on the environment if they are done in accordance with the conditions and there is no obvious justification to regulate these activities by resource consents. This conclusion is reinforced by the lack of feedback on the relevant permitted activity rules in the Draft Regional Plan and accordingly no other options have been considered.

Replacement water permits

The term replacement water permits refers to a resource consent to take or use water that replaces an expiring or expired consent. Sections 124 - 124C of the RMA provide for the exercise of a resource consent when applying for a new consent, and applications by existing holders of resource consents and by people who are not existing holders of a resource consent. Of note, Section 124B(2) affords priority to an application for a replacement consent by an existing holder of resource consent over an application for a resource consent for the use of the same resource made by another person.

Applications for resource consents can be time-consuming and expensive and in some cases it may not be appropriate to re-litigate matters in an application for a replacement resource consent. That is because the actual and potential environmental effects of an activity may have been adequately assessed as part of the application for the original resource consent. For this reason it may be appropriate to provide an easier (that is, less onerous) and guaranteed pathway for replacement consents. In this case, applications for replacement water permits. This could be done by classifying an application for a replacement consent as a controlled activity rather than, in most cases, a restricted discretionary, discretionary, or non-complying activity. However, we need to consider if it is appropriate to guarantee replacement consents for all activities or just some activities. This is because competing applications for the same resource made under Section 124C of the RMA may be for more efficient and higher value uses of water. A controlled activity rule for replacement consents would effectively bar competing applications for resource consents.

However we think that registered drinking water supplies warrant protection in terms of continued access to fresh water and low administrative costs associated with replacement consents under a controlled activity rule.

Unauthorised takes

It is very likely that there are unauthorised water takes in Northland. That is, takes that are not currently permitted by a rule in the Regional Water and Soil Plan or by resource consents. Under the new plan, people taking the water are likely to lose access to it if they are in fully allocated catchments or cause catchments to be over allocated. We understand that farmers taking water for dairy shed use are the majority of people with unauthorised takes.

We think that it is appropriate to encourage people with unathorised takes to comply with the proposed new permitted activity rules or apply for resource consent to authorise their takes. We are proposing that this is done by including a controlled activity rule in the plan for takes that existed but were not lawfully established at the notification date of the plan and that do not exceed 50 cubic metres per property per day, provided:

1) An application for resource consent to authorise the activity is lodged within 12 months from the operative date of this plan; and
2) The resource consent application contains verifiable evidence that the take existed at the notification date of the plan, the volume and rate of take, and that the volume of the take is the same of less than what occurred at the notification date.

50 cubic metres is a subjective figure but should provide sufficient water for dairy shed use on almost all dairy farms (assuming that that the source is water bodies). The matters of control in the rule would be:

- The timing, rate and volume of the take;
- Measures to avoid, remedy or mitigate effects on aquatic ecosystems and species; and
- Measures to ensure the reasonable and efficient use of water.

We consider that larger takes (that is, greater than 50 cubic metres per property per day) should be classified as discretionary activities, which means that the council has the ability to grant or decline applications for resource consent.

The alternative option is to not include rules in the new regional plan that provide a pathway for unauthorised takes to be authorised. That would mean people that are currently taking water illegally run the risk of losing access to water under the new regional plan. In other words, will be either non-complying or prohibited activities (based on our recommendations below). However, we think that this would be tough on people who are not aware of the current rules.

Efficient use of water

The efficient use of natural resources is enshrined in the principles of the RMA.[50] It is also a key directive of the NPS-FM, which requires regional councils to include provisions in regional plans to encourage the efficient use of water. Water efficiency is addressed through some of the options for RMA s14(3)(b) and permitted takes. For larger takes that require water permits, we consider that the most appropriate option is to include policy in the regional plan that directs applicants to justify that the amount of water sought is reasonable and will be efficiently used. This is consistent with the way that most regional councils encourage the efficient use of water.

Because of our obligations under the NPS-FM we have not considered other options to encourage the efficient use of water.

5.3.5 High level objectives and measures

Section 32 of the RMA requires an assessment of "*...the efficiency and effectiveness of the provisions in achieving the objectives...*". Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section 1.6 'Evaluation approach' for more details.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against.

High level objective	Measure

Minimise administrative costs to water users.	Costs associated with accessing and using water pursuant to rules and water permits:
	• Permitted activity = not applicable ($0).
	• Controlled (typically non-notified) = $839.
	• Discretionary or non-complying (typically limited or fully notified) = $3144.
	• Prohibited = not applicable ($0).
	• Transfer of water permits:
	  • Permitted = not applicable ($0).
	  • Controlled (typically non-notified) = $460.
	  • Discretionary (typically notified) = $734.
	• Basic water meter and installation costs (for takes of <5L/s)[51] = approx. $500.
	• Annual administration and monitoring charges, including for maintaining the council's hydrometric network:
	  • Permitted = not applicable ($0).
	  • Consented minor take = around $200 per annum.
	  • Consented moderate take = around $500.
	  • Consented significant take = around $1000.
	Note: *costs do not include those associated with preparing and considering applications for a resource consent.*

Minimise adverse effects on aquatic ecosystems and other water resource users.	The ability to control the activity so that adverse effects are avoided, remedied, or mitigated:

50 *RMA s7(b)*

51 *Water takes of ≥5L/s are required to be metered by national regulations (Resource Management (Measurement and Reporting of Water Takes) Regulations 2010).*

High level objective	Measure
	• Low • Moderate • High • Significant • Full

Explanation for the high level objectives and measures

Minimise administrative costs to water users

The first objective is to minimise administrative costs associated with accessing water pursuant to rules and water permits (that is, the costs of applying for water permits and/or complying with conditions of rules and permits including monitoring requirements).

Costs are typically proportionate to the level of information needed in the preparation and consideration of an environmental impact assessment and the nature of ongoing monitoring and reporting requirements. Full details on the costs can be found in the council's charging policy 2015/16. It is important to note though that the costs associated with preparing an application for resource consent can be significantly more than the cost of lodging the application with the council. However they differ depending on the nature of the activity and cannot be determined with any confidence for the purposes of this assessment.

Minimise adverse effects on aquatic ecosystems and other water quantity dependent values

The second objective is to minimise adverse effects associated with the taking of water on aquatic ecosystems and other water users. The health of aquatic ecosystems can be affected by changes to flows and water levels. New water takes also have the potential to, if not managed properly reduce the reliability of water for existing users. While water quantity limits (minimum flows/levels and allocation limits) are set to define maximum tolerable adverse effects at a regional scale, a case-by-case assessment of actual and potential adverse effects is often still needed to deal with site-specific values that may not be adequately protected by default interim water quality limits. In other words, the recommended default limits (minimum flows/water levels and allocation limits) provide for the protection of flow sensitive native species and reliability of supply for water users at a regional scale, but do not expressly provide for other values such as natural character and recreation, which are site specific.

We have used a constructed measure to assess if the management options are likely to provide the council with adequate ability to manage adverse effects on aquatic ecosystems and impacts on other water users.Generally speaking a permitted activity rule does not provide the council with as much control as a rule that requires an activity to be authorised by a resource consent, or indeed a rule that prohibits an activity. The classes of rules that require resource consents are controlled, restricted discretionary, discretionary and non-complying, which offer increasing ability for the council to manage adverse effects on the environment. The constructed measure generally aligns to an extent with the classes of activities under the RMA but also reflects the conditions of the rules.

High level objectives not included

We included an objective above on minimising the adverse effects of the taking and use of water on aquatic ecosystems and other water resource users, but not other water quantity-dependent values like natural character or recreation. This is because managing flows and water levels for aquatic ecosystems generally will provide for other beneficial values such as natural character and other intrinsic values. It is also very difficult to make predictions on the consequences of the management options at local (that is, site-specific) scale.

Section 32 requires an assessment of the impacts on economic growth and employment opportunities (s32(2)(a)). The impacts of the management options on economic growth and employment opportunities cannot be determined with any confidence. Therefore, economic growth and employment opportunities have not been included as high level objectives. For more information go to the section 1.7 'Assessing impacts on economic growth and employment opportunities'.

5.3.6 Evaluating the management options

Evaluation of management options for RMA s14(3)(b) water takes

High level objective	Measure	Option A: remain silent on RMA s14(3)(b) takes	Option B: permit RMA s14(3)(b) takes through a rule	Option C: controlled activity rule
Minimise administrative costs to water users	Costs of applying for a resource consent (including transferring water permits), and monitoring and metering requirements	$0	$0	$839 (consent application) $200 per annum (monitoring costs)
Minimise adverse effects on aquatic ecosystems and other water resource users	The ability to control the activity so that adverse effects are avoided, remedied, or mitigated: • Low • Moderate • High • Significant	Low-moderate	Low-moderate	Moderate

Evaluation of management options for other minor water takes

High level objective	Measure	Option A: retain current permitted activity rules	Option B: update and simplify permitted activity rules	Option C: controlled activity rules
Minimise administrative costs to water users	Costs of applying for a resource consent (including transferring water permits), and monitoring and metering requirements	$0	$0 (no water meter) *or* $500 (water meter, if take is <5L/s)	$839 (consent application) $500 (water meter, if take is <5L/s). $200 per annum (monitoring costs)
Minimise adverse effects on aquatic ecosystems and other water resource users	The ability to control the activity so that adverse effects are avoided, remedied, or mitigated: • Low • Moderate • High • Significant	Low-moderate	Moderate-high	High

Evaluation of management options for other water takes where water is available

High level objective	Measure	Option A: controlled activity rule	Option B: discretionary activity rule
Minimise administrative costs to water users	Costs of applying for a resource consent (including transferring water permits), and monitoring and metering requirements (for takes <5 L/s)	$839 (consent application). $500 (water meter, if take is <5L/s) $200-$1000 (annual monitoring fee) depending on the nature of the take	$3144 (consent application fee if notified) *or* $839 (consent application if non-notified) depending on the nature of the take $500 (water meter, if take is <5L/s) $200-$1000 (annual monitoring fee) depending on the nature of the take
Minimise adverse effects on aquatic ecosystems and other water resource users	The ability to control the activity so that adverse effects are avoided, remedied, or mitigated: • Low • Moderate • High • Significant	Moderate	High-significant

Evaluation of management options for transferring water permits

High level objective	Measure	Option A: permitted activity status	Option B: controlled activity status	Option C: policy on transferring water permits to guide applications under RMA s136(4)
Minimise administrative costs to water users	Primary costs of applying for a resource consent (including transferring water permits), and monitoring and metering requirements (for takes <5L/s)	$0	$460 (consent application fee)	$734 (consent application fee)
Minimise adverse effects on aquatic ecosystems and other water resource users	The ability to control the activity so that adverse effects are avoided, remedied, or mitigated: • Low • Moderate • High • Significant	Low	High	Significant

Certainty about the evaluation

We are reasonably confident in the technical basis of our evaluation as is based on best available information.

Time-frame of the evaluation

The time-frame of this evaluation is the life of the plan (10-15 years).

The preferred management options

Having considered the options we consider that it is best to continue with the current approach for managing RMA s14(3)(b) takes by not including a rule for them in the regional plan. This is because in most areas the amount of water taken for stock drinking purposes and domestic needs is low relative to the available allocation, the current approach has worked and is arguably more flexible than using a permitted activity rule, and the administrative costs of options A and B are the same. Requiring that all RMA s14(3)(b) takes be authorised by resource consents would impose significant administrative costs across the region with little utility.

Similar, we consider that it is appropriate to continue to permit the following activities because they are environmentally low risk activities:

- the temporary taking of fresh water for road construction, road maintenance, and dust suppression;
- the taking of fresh water from an off-stream dam;
- the taking of fresh water from an artificial water course; and
- the taking of fresh water from ground water associated with bore development, bore testing or dewatering.

With regard to other minor takes, we consider that option B is the most appropriate option for managing them. That is because it provides the council with more ability to adequately control their actual and potential adverse effects on the environment without imposing additional administrative costs, with the exception of monitoring requirements.

We consider that for larger takes, where water is available for extraction, should be managed under a discretionary activity rule (Option B) rather than a controlled activity rule (Option A). The council may need to the ability to not grant applications for resource consents for large takes that have the potential to cause significant adverse effects on the environment, which a controlled activity rule does not allow.

The NPS-FM requires us to include criteria in the new plan by which applications for approval or transfers of water permits to the decided. We consider that the most appropriate option is to include the criteria in a policy (option C) rather than in a controlled or permitted activity rule. That is because it provide the council with more ability to adequately manage significant adverse effects on the environment.

We also think that it is appropriate to include non-complying and prohibited activity rules of takes that will exceed a water quantity limit, for reasons documented earlier. We consider that this is consistent with the NPS-FM.

5.4 Land drainage and river control activities

5.4.1 Executive summary

This report focuses on the management of land drainage and flood control activities in Northland under the Resource Management Act (currently regulated by rules in the Regional Water and Soil Plan for Northland). It does not look at the management of:

- Wetlands – refer to section 6.4 'Wetlands';
- Natural hazard risk – refer to section 10 'Natural hazards'; or
- Structures in freshwater bodies – refer to section 6.3 'Dams, diversions, and fresh water structures'.

Much of Northland's low-lying land has been drained for primary production or urban development. Land drainage activities involve the taking, diverting and discharge of water – activities that are restricted by sections 13, 14 and 15 of the Resource Management Act 1991 (RMA). Land drainage activities are generally undertaken to lower water levels in soil for development and agricultural use, and to control the risk of flood hazard events. Drainage and flood control powers are also provided to local authorities under the *Land Drainage Act 1908, Soil Conservation and Rivers Control Act 1941* and the *Local Government Act 1974*, all of which are subject to the RMA.

Land drainage and flood control activities include:

- Maintenance of assets within public drainage networks (Drainage Districts) and Flood Control Schemes – these are either managed by local authorities or a group of land owners who have assumed control pursuant to s517A to s517ZM of the Local Government Act 1974;
- Diverting and discharging drainage water within private land drainage networks;
- Maintenance of existing stopbanks and floodgates;
- Maintenance (cleaning/clearing) of drainage channels; and
- Construction of new flood control and drainage schemes.

There are 34 active (rated) drainage districts in Northland. The vast majority (28) are in the Kaipara district. Four are in the Far North and two are in the Whangārei district. The respective district councils manage the land drainage schemes. These schemes tend to consist of a network of culverts and drainage channels, floodgates, bunds and stopbanks. All these schemes were established well before the RMA was enacted in 1991 and provide flood and/or erosion protection benefits to a defined community, which pay for these benefits through targeted rates.

The regional council also maintains three (rated) flood control schemes (Awanui, Kaeo and Whangarei), which consist of various structures, including spillways, stopbanks, floodgates and a dam.

This section evaluates three different 'packages' of options to manage land drainage and flood control activities:

1) Option A – rolling over the status quo (existing provisions in the Regional Water and Soil Plan) - this is the strictest regulatory approach;
2) Option B – light regulatory approach; and
3) Option C – medium regulatory approach (middle ground between options A and B).

Option C has come out as the preferred option. The rules and key policy approach for this management option are summarised in the following table:

Works within drainage districts by councils or land owners that have assumed responsibility under Local Government Act 1974	Activities affecting drainage and flood control schemes	Re-consenting existing flood control schemes	Key policy approach
Controlled activity.	Flood control schemes only: Discretionary for activities within 10m of the bed that impede the functional integrity of the scheme or access for maintenance purposes. No control over activities affecting drainage schemes.	Controlled activity.	Avoid activities that impede the functional integrity of flood control schemes and activities that inhibit access to the schemes for maintenance purposes.

With regards to the potential for activities to affect drainage and flood control schemes, Option B is exactly the same as the existing rule in the Regional Water and Soil Plan (Option A), which has a 3 metre setback from the bed of a river or edge of a drain for activities that may impede their functional integrity or access to them for maintenance purposes. Under Option C, there is a 10 metre setback from regional council managed flood control schemes and no rule regulating activities around district council managed land drainage schemes. This option scored highly against the second high level objective because there is considered a low potential for structures/land disturbance activities to impede the functional integrity of flood schemes or impede access to them under this option – 10 metres is considered ideal to allow access for council's workers and machinery to access the assets for maintenance purposes.

It is noted that Far North District Council and Kaipara District Council have respective land drainage bylaws in place that restrict obstructions (such as trees or structures) within 10 and 15 metres respectively of drainage channels within their districts. This therefore covers 33 of the 34 drainage districts in Northland (the remaining one being the Hikurangi scheme in Whangārei district). The proposed 10m setback will therefore align with district council bylaws and should lead to less confusion/duplication, as it will only relate to setbacks from regional council managed flood control schemes.

Another difference between the preferred option and Option A is that under the preferred option, the re-consenting of established flood schemes is a 'controlled' activity, whereas there is no rule for this in the existing plan – meaning that it would default to a 'discretionary' activity. The preferred option has therefore scored better against the objective of 'maximising certainty of re-approval for existing flood control schemes' because a controlled activity means that resource consent cannot be declined. This is considered appropriate as it recognises the significant investment that has previously been undertaken to get these works consented and operational.

5.4.2 Relevant provisions

This evaluation supports the following Regional Plan provisions for land drainage:

- Rules - C.4.1 - C.4.8 Land Drainage section
- Policy - D.4.26 Activities affecting flood control schemes
- Policy - D.4.27 New land drainage

5.4.3 The problem, opportunity and/or requirement

This report focuses on the management of land drainage and flood control activities in Northland under the Regional Water and Soil Plan for Northland. It does not look at the management of:

- Wetlands – refer to 6.4 'Wetlands';
- Flood hazard risk – refer to 10.4 'Flood hazard risk'; and
- Structures in freshwater bodies – refer to 6.3 'Dams, diversions, and fresh water structures'.

These are all considered in separate sections of the section 32 evaluation report. Additionally, this report does not assess district council land drainage bylaws because they are not promulgated under the Resource Management Act 1991 (meaning they do not site within regional/district plans), nor does the regional council have any power to enforce district council bylaws.

Land drainage activities are generally undertaken to lower water levels in soil for development and agricultural use, and to control the risk of flood hazard events.

Much of Northland's low-lying land has been drained for primary production or urban development. Land drainage activities involves the taking, diverting and discharge of water – activities that are restricted by sections 13, 14 and 15 of the Resource Management Act 1991 (RMA).

Drainage and flood control powers are provided to local authorities under the *Land Drainage Act 1908, Soil Conservation and Rivers Control Act 1941* and the *Local Government Act 1974*. Nothing in these Acts shall deviate from responsibilities and restrictions under the RMA, meaning that if the RMA (or plans prepared under the RMA) require a resource consent be obtained for a structure or an activity then this must still happen).

Legally, it is the land owner or occupier's responsibility to maintain watercourses on their property to provide a free flow of water. The regional council can, under the *Land Drainage Act 1908* and the *Local Government Act 1974* require any land owner to do so – see section 62 of the *Land Drainage Act* and section 511 of the *Local Government Act 1974*.

Land drainage and flood control activities include:

- Maintenance of assets within public drainage networks (Drainage Areas) and Flood Control Schemes – these are either managed by local authorities or a group of land owners who have assumed control pursuant to s517A to s517ZM of the Local Government Act 1974;
- Diverting and discharging drainage water within 'private' land drainage networks;
- Maintenance of existing stopbanks and floodgates;
- Maintenance (cleaning/clearing) drainage channels; and
- Construction of new flood control and drainage schemes.

Potential issues associated with these activities include:

- Potential adverse effects on aquatic ecosystems (including destruction of inanga spawning sites, flood gate fish barriers and drawing in fish when pumping);
- Water quality degradation;
- Wetland drainage; and
- Potential for increased flooding effects on other property upstream or downstream of the works.

There are 34 active (rated) drainage areas in Northland. The vast majority (28) are in the Kaipara district. Four are in the Far North and two are in the Whangārei district. The respective district councils manage the land drainage schemes. These 'schemes' tend to consist of a network of culverts and drainage channels, floodgates, bunds and stopbanks. The majority of schemes were established well before the RMA was enacted in 1991. They are a legal established entity that provides flood and/or erosion protection benefits to a defined community. Schemes facilitate a co-ordinated approach where protection work undertaken by individuals would not necessarily be sufficiently comprehensive to deliver desired benefits.

The Northland Regional Council manages several 'flood control' schemes in Northland. These include Awanui, Kaeo and Kaihū. Management of these schemes is undertaken in accordance with a River Management Plan in consultation with liaison committees. The aim of the schemes is to reduce river flood risk, whereas the main purpose of drainage schemes is to enable

land to be used for primary production on an ongoing basis. The schemes typically involve the maintenance of scheme assets, such as stopbanks, spillways and floodgates, and the removal of accumulated sediments or vegetation from river channels. These works are generally funded via income from targeted rates.

Within drainage districts and flood control schemes, activities undertaken within the beds of rivers or artificial watercourses or adjacent to them by people other than scheme managers, have the potential to impede the functional integrity of the drainage district or flood control scheme and impede access required for maintenance purposes. Examples of activities include:

- The construction of structures or fences adjacent to drainage channels/flood control schemes (which impede access to the scheme);
- The deposition of rock or debris within drainage channels;
- The destruction of stopbanks or access tracks being cut into them (which may compromise the functional integrity of the structure); and
- Mechanical disturbance of stopbanks or riverbank erosion protection structures during construction or maintenance of non-scheme assets could compromise the integrity of the protection structure, and potentially contribute to it failing during a subsequent flood event.

The Regional Water and Soil Plan currently requires a resource consent (discretionary activity) for activities within three metres of the bed of a river or artificial watercourse that impede the functional integrity of drainage districts and flood control schemes. The Far North and Kaipara District Council also have land drainage bylaws in place, which restrict the same types of activities directly above from occurring for a distance of 10 or 15 metres from the bank of drains.

Generally speaking, the existing Regional Water and Soil Plan rules for land drainage activities are considered appropriate and there is no need for a fundamental overhaul of the rules[52]. Outside drainage districts, the current plan permits existing land drainage activities (subject to compliance with conditions) and there are no reasons why this approach cannot be rolled over. Any new stopbanks or flood control schemes currently require a resource consent (generally a discretionary activity) and this activity status is appropriate because of the potentially significant adverse effects associated with construction of these works.

5.4.4 Management options

This section summarises the suite of management options for land drainage and flood control activities. The intention is not to identify every different combination of approach as there would be many, but to represent the range of options and highlight key differences in approaches.

There are some provisions in the current Regional Water and Soil Plan that council doesn't think need changing and are unlikely to be contentious. There are also some new provisions that are obvious for the new Regional Plan. The following is a list of these uncontentious and obvious provisions that will be implemented regardless of the option selected:

- The taking, diversion and discharge of drainage water associated with the drainage of land (other than public drainage districts within drainage districts and flood control schemes) will be a permitted activity subject to conditions. This is currently permitted and no reasons have been identified (by regional council staff) why a more restrictive rule regime should apply). (Rule C.4.1).
- The repair of existing authorised stopbanks and drains will be a permitted activity. This activity is currently permitted and is considered a minor activity with a low risk of adverse effects occurring. (Rule C.4.3).
- New land drainage and flood control schemes and modifications/extensions to existing schemes will be a discretionary activity (this is a rollover of the existing rule and is considered appropriate because of the scale of these works and the potential to generate significant adverse environmental effects). (Rule C.4.6).
- Any activity associated with land drainage or flood control, which is restricted by sections 13, 14 or 15 of the RMA but not expressly regulated by other rules remain a 'discretionary' activity.

52 *See page 23 of water quantity section of regional plans review summary - http://www.nrc.govt.nz/contentassets/0d3e217aec2346549fdbd0b3e579c501/regional-plan-review--summary---water-quantity.pdf*

Key terms

An explanation of the key terms used in describing the options:

Land drainage

The activity of lowering the water level in the soil to achieve productive land use, to facilitate the stability of land or structures.

Land drainage scheme

Means all drainage channels or land drainage works relating to a particular land drainage system vested in a council or a group of landowners who have assumed control of the scheme pursuant to s517Z of the Local Government Act 1974.

Activities affecting drainage and flood control schemes

This includes any of the following activities undertaken within a drainage district or flood control scheme, which impede the functional integrity of the drainage district or flood control scheme or impede access required for maintenance purposes:

- The introduction or planting of any plant in, on or under the bed of any river, lake or artificial water course;
- The erection of any building, fence or other structure in, on, or under the bed of any river, lake or artificial water course;
- The deposition of any rock, shingle, earth, debris or other substance in, on, or under the bed of any river, lake or artificial water course;
- The undertaking of any other land disturbance activity; and
- Disturbance of a stopbank.

Management options

Option A: status quo – existing provisions in Regional Water and Soil Plan for Northland

Overview: the most restrictive option assessed.

Background: the current approach to managing land drainage and river control activities in the Regional Water and Soil Plan. This approach would 'roll over' the existing provisions in Section 27 of the Regional Water and Soil Plan relating to land drainage and river control activities. The existing rules differentiate between land drainage other than public drainage networks within drainage districts and activities within drainage districts and flood control schemes.

Works within land drainage schemes	Activities affecting drainage and flood control schemes	Re-consenting existing flood control schemes	Key policy approach
Controlled-subject to conditions (including production of management plan) otherwise'discretionary'.	Discretionary for activities within 3m of the bed that impede the functional integrity of the scheme or access for maintenance.	No specific rule so discretionary activity.	1) Manage areas subject to land drainage and flood control schemes through long duration resource consents that are supported by management plans. 2) Avoid, remedy or mitigate adverse effects resulting from the maintenance of existing land drainage and flood control schemes, and any new works associated with those existing schemes.

Option B: permissive approach

Overview: the most permissive of options tested. Includes a specific controlled activity rule for the re-consenting of existing flood control schemes.

Background: this option is a combination of 'rolling over' some existing provisions in the operative Regional Water and Soil Plan as well as relaxing some rules (such as works within land drainage schemes).

Works within land drainage schemes	Activities affecting drainage and flood control schemes	Re-consenting existing flood control schemes	Key policy approach
Permitted if have a land drainage management plan otherwise controlled activity.	Discretionary for activities within 3m of the bed that impede the functional integrity of the scheme or access for maintenance.	Controlled activity.	Avoid activities that impede the functional integrity of flood control schemes and activities that inhibit access to the schemes for maintenance purposes.

Option C:

Overview: under this option, works within land drainage schemes are controlled activities if they are not already covered as permitted activities. The requirement to produce management plans for land drainage schemes has been removed under this option, recognising that the matters that would be covered in a management plan can be covered under the matters of control within the rule. Activities that impede the functional integrity of NRC flood control schemes will require consent as a discretionary activity.

Background: this option was suggested by the regional council's river management team, in recognition that the existing three metre setback requirement is not sufficient to enable large machinery to access flood control schemes for maintenance purposes. A 10 metre setback restriction would also be consistent with district council bylaws for activities near their land drainage schemes. In recognition that both the Far North and Kaipara District Councils have land drainage bylaws that control/restrict activities within 10m and 15m respectively from drains within drainage schemes (comprising 32 of the 33 drainage schemes in Northland), this rule proposes to only regulate a setback from regional council flood control schemes.

Works within land drainage schemes	Activities affecting drainage and flood control schemes	Re-consenting existing flood control schemes	Key policy approach
Controlled activity	Flood control schemes only: discretionary for activities within 10m of the bed that impede the functional integrity of the scheme or access for maintenance purposes. No control over activities affecting drainage schemes.	Controlled activity.	Avoid activities that impede the functional integrity of flood control schemes and activities that inhibit access to the schemes for maintenance purposes.

5.4.5 High level objectives and measures

Section 32 requires an assessment of "*...the efficiency and effectiveness of the provisions in achieving the objectives...*". Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section 1.6 'Evaluation approach' for more details.

'High level objectives':

- Capture the fundamental things (or values) that matter to people (the key costs and benefits) when determining the best management option;

- Signal a direction for where we want to head, without stating how far we go; and
- Are what the management options are assessed against to determine their efficiency and effectiveness (s32(1)(b)(ii)).

Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against.

High level objective	Measure
Minimise regulatory costs to councils and land owners undertaking drainage and discharge activities within drainage districts.	Consent activity status for drainage and discharge activities within drainage districts: 1 = consents required for all activities (current non-notified fee is $838.50). 2 = permitted activity if management plan prepared (otherwise controlled).
Minimise risk of new structures and activities impeding functional integrity of established drainage and flood schemes and access to them for maintenance purposes.	Potential for new structures and land disturbance activities to impede functional integrity of drainage/flood schemes or inhibit access to them: 1 = high potential for structures/activities to inhibit access or impede functional integrity. 2 = medium potential for structures/activities to inhibit access or impede functional integrity. 3 = low potential for structures/activities to inhibit access or impede functional integrity.
Maximise certainty of re-approval for existing flood control schemes.	Consent activity status and cost for re-consenting existing flood control schemes: 1 = discretionary (current notified/limited notified fee is $3144). 2 = controlled (current non-notified fee is $838.50). 3 = permitted (no application fee).

Minimise regulatory costs to councils and land owners undertaking drainage and discharge activities within drainage districts

The purpose of the RMA (s5) includes allowing people to provide for their social and economic well-being and for their health and safety. Drainage of land within established land drainage schemes enables land owners to provide for their social and economic well-being by making their land more financially viable and reducing the likelihood of flooding. This measure solely relates to 'maintenance' work within established schemes – it does not relate to the potential adverse effects associated with the creation of new drainage schemes. This measure therefore looks at the activity status for drainage and discharge activities within established drainage districts – either a controlled activity (requiring a resource consent with an associated application fee – currently $838.50 for a non-notified application) or a permitted activity (with no cost). It does not consider the cost of preparing a resource consent application because the time, level of detail and associated cost varies from application to application.

Minimise risk of new structures and activities impeding functional integrity of established drainage and flood control schemes and access to them for maintenance purposes

This objective has been chosen because land disturbance activities and the placement of structures (within and directly adjacent to drainage channels and flood control schemes) have the potential to impede the functional integrity of established schemes and inhibit access to them for maintenance purposes (such as the ability of contractors to use machinery to clear drains). The measure therefore looks at the likelihood new structures and land disturbance activities may inhibit access or

impede the functional integrity of established land drainage and flood control schemes. The constructed 'likelihood' will either be high, medium or low. The 'high' likelihood assumes there is no minimum setback requirement (in the regional plan) and structures/land disturbance activities could be built/undertaken on or directly adjacent to drains/stopbanks etc. The 'medium' likelihood assumes that structures/land disturbance activities can be carried out between one and 10 metres from the edge of a bank of drainage channel, while the 'low' likelihood assumes there is a 10 metre setback requirement, so long as activities do not impede the functional integrity or access to drainage and flood control schemes for maintenance purposes. The assumption being that the greater distance away from the stopbank/drain that activities occur, access will be less likely to be impeded and the risk of functional integrity being impacted is more likely to be minimised.

Maximise certainty of re-approval for existing flood control schemes

This objective has been chosen in recognition of the significant financial investment behind established flood control schemes. Councils are required to go through a rigorous public participatory process when they initially apply for consents for the scheme works. The underlying concept behind flood control schemes is to reduce the risk of harm from flood hazard events. As these works increase the resilience of communities on floodplains, it is therefore crucial that there is a high level of certainty that the schemes will get re-approval. This measure looks at the activity status for established flood control schemes – either a 'discretionary' activity (meaning consent could technically be refused and therefore there is no certainty), a 'controlled' activity (meaning a consent is required but can not be refused – high certainty) or a permitted activity (no consent required and a very high level of certainty).

High level objectives not included

Section 32 requires an assessment of the impacts on economic growth and employment opportunities (s32(2)(a)). However, the impact of the management options on economic growth and employment opportunities is imperceivable and/or can't be determined with any confidence. Therefore, economic growth and employment opportunities have not been included as high level objectives. For more information go to the section 1.7 'Assessing impacts on economic growth and employment opportunities'.

A high level objective relating to minimising effects on wetlands and aquatic ecosystems was considered but disregarded because the activity status for new land drainage and flood control schemes is the same for all options – 'discretionary' activity. As these activities will require a resource consent to establish, the potential adverse effects on aquatic ecosystems and wetlands can be determined on a case-by-case basis and consent can be refused if adverse effects are considered to be too high or consent can be granted with conditions that help to avoid, remedy or mitigate any adverse effects on these values.

5.4.6 Evaluating the management options

High level objective and measure	Option A: status quo	Option B: permissive approach	Option C: modified option B.
Minimise regulatory costs to councils/land owners undertaking drainage and discharge activities within drainage districts. Measure: *Consent activity status for drainage and discharge activities within drainage districts.* *1 = consents required for all activities (current non-notified fee is $838.50).* *2 = permitted activity if management plan prepared (otherwise controlled).*	1	2	2
Minimise risk of new structures/activities impeding functional integrity of established drainage and flood schemes and access to them for maintenance purposes. Measure:	2	2	3

High level objective and measure	Option A: status quo	Option B: permissive approach	Option C: modified option B.
Potential for new structures and land disturbance activities to impede functional integrity of drainage/flood schemes or inhibit access to them. *1 = high potential for structures/activities to inhibit access or impede functional integrity.* *2 = medium potential for structures/activities to inhibit access or impede functional integrity.* *3 = low potential for structures/activities to inhibit access or impede functional integrity.*			
Maximise certainty of re-approval for existing flood control schemes. Measure: *Consent activity status for re-consenting existing flood control schemes.* *1 = discretionary (current notified/limited notified fee is $3144).* *2 = controlled (current non-notified fee is $838.50).* *3 = permitted (no application fee).*	1	2	2

Certainty about the evaluation

Overall we're reasonably confident about the accuracy of the evaluation for all options. We don't think it would be viable and/or worthwhile to get more information to increase the accuracy of our evaluation as it's very unlikely to change the relative differences between the options. The measures for the first and third objectives are linked directly to the activity status for resource consent applications, while the measure for the second objective is the likelihood that new structures/land disturbance activities might impede functional integrity or access to drainage and flood control schemes. This 'likelihood' will likely come down to a case-by-case basis but there is inherently a lot less certainty surrounding this measure than the other two.

Time-frame of the evaluation

The evaluation is made over the life-time of the plan (10-15 years).

The preferred management option

The preferred management option for the Proposed Regional Plan is Option C.

Options B and C are identical except for the rule relating to activities affecting drainage and flood control schemes. Option B is exactly the same as the existing rule in the Regional Water and Soil Plan (option A), which has a 3m setback from the bed of a river or edge of drain for activities that may impede their functional integrity or access to them for maintenance purposes. Under the preferred option, there is a 10 metre setback from regional council managed flood control schemes and no rule regulating activities around district council managed land drainage schemes. This has therefore scored highly against the second high level objective because there is considered a low potential for structures/land disturbance activities to impede the functional integrity of flood schemes or impede access to them under this option – 10 metres is considered ideal to allow access for council's workers and machinery to access the assets for maintenance purposes. It is noted that Far North District Council and Kaipara District Council have respective land drainage bylaws in place that restrict obstructions (such as trees or fences) within 10 and 15 metres respectively of drainage channels within their districts. This therefore covers

32 of the 33 drainage districts in Northland (the remaining one being the Hikurangi drainge scheme in Whangārei district). The 10 metre setback will therefore align with district council bylaws and should lead to less confusion/duplication, as it will only relate to setbacks from regional council managed flood control schemes.

There are two other differences between the preferred option and Option A. Firstly, under the preferred option, works within drainage districts by councils or land owners that have assumed responsibility under the Local Government Act 1974 are 'permitted' if they comply with conditions, which include a drainage district management plan being submitted. Failure to comply with this will be a 'controlled' activity. Under existing provisions, these works are 'controlled' if they can comply with conditions, which include a management plan being submitted. Failure to comply with this is a 'discretionary' activity. Regulatory costs are therefore minimised under the preferred option (compared to the status quo), as there would be no resource consent application costs under this option (if a management plan is submitted). This therefore achieves the first high level objective better than option A.

Secondly, under the preferred option, the re-consenting of established flood schemes is a 'controlled' activity, whereas there is no rule for this in the existing plan – meaning that it would currently default to a 'discretionary' activity. The preferred option has therefore scored better against the objective of 'maximising certainty of re-approval for existing flood control schemes' because a controlled activity means that resource consent cannot be declined. This is considered appropriate as it recognises the significant investment that has previously been undertaken to get these works consented and operational.

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6 Wetlands and beds of lakes and rivers

6.1 Legal background

The purpose of the RMA is sustainable management as set out in section 5 which requires managing the use, development and protection of natural resources in a way that provides for social, economic and cultural wellbeing, health and safety, while safeguarding the life supporting capacity of water and ecosystems, and avoiding, remedying or mitigating any adverse effects on the environment. In Part 2 the RMA also requires that certain matters of national importance be provided for by people exercising functions under the Act, including the preservation of the natural character of rivers and their margins, and the protection of significant indigenous flora and fauna. The provisions also require that people exercising functions under the RMA, must have regard to certain other matters including relevant ecosystem values, maintenance and enhancement of environmental quality.

The RMA defines river, bed and lake which are directly relevant to the management of activities in the beds of rivers and lakes. The RMA definition of a river is that it "*means a continually or intermittently flowing body of fresh water; and includes a stream and modified watercourse; but does not include any artificial watercourse (including an irrigation canal, water supply race, canal for the supply of water for electricity power generation, and farm drainage canal)*". The definition is very broad and includes any permanently or intermittently flowing body of water. This is significant as the restrictions on the use of river beds in section 13 of the RMA (discussed below) apply to everything from headwater ephemeral water courses through to large rivers.

The bed of a river is defined in the RMA as "*the space of land which the waters of the river cover at its fullest flow without overtopping its banks*". The bed of a lake is defined as "*the space of land which the waters of the lake cover at its highest level without exceeding its margin.*" In some rivers and lakes the banks and margins are easily defined and a relatively small and obvious area of land can be considered the 'bed'. For other rivers and lakes the bed can potentially be very wide, for example, lakes with wide seasonal fluctuations.

Section 13 of the RMA identifies restrictions in relation to the use of beds of rivers and lakes. This section has two parts, the first identifies the activities that nobody may do unless specifically allowed by a rule in a plan. This section is often referred to as the 'restrictive' section. The second part identifies activities that may be undertaken unless restricted by a rule in a plan. This section is often referred to as an 'enabling' section.

Section 13 'restricts' a person's ability to:

(a) use, erect, reconstruct, place, alter, extend, remove or demolish any structure or part of any structure in, on, under, or over the bed; or; or

(b) excavate, drill, tunnel, or otherwise disturb the bed; or

(c) introduce or plant any plant or any part of any plant (whether exotic or indigenous)in, on or under the bed; or

(d) deposit any substance in, on, or under the bed; or

(e) reclaim or drain the bed.

The second part of section 13 of the RMA 'enables' entering onto or passing across the bed of a lake or river and damaging, destroying, disturbing, or removing a plant or a part of a plant or habitat of plant or animal, whether exotic or indigenous, in, on, or under the bed of a lake or river.

If the regional council wishes to provide for any of the activities in the 'restrictive' section, it must provide for them specifically in the proposed plan, otherwise a resource consent is required under the RMA. This is particularly important in relation to the use of structures, even existing structures such as bridges, which must be specifically allowed for by the proposed Plan or else a resource consent is required.

Section 30(1)(c) contains a provision for regional councils to control the use of land for certain purposes including the beds of rivers and lakes. These include soil conservation, the maintenance and enhancement of the quality of water and ecosystems in water bodies and the avoidance or mitigation of natural hazards.

Section 30(1)(g) provides further functions specifically in relation to the bed of a water body, and allows the regional council to control the introduction or planting of any plant in the bed for soil conservation, water quality and natural hazard reasons (the maintenance and enhancement of ecosystems is not provided for in relation to controlling planting).

Section 30(1)(ga) provides for the establishment, implementation, and review of objectives, policies, and methods for maintaining indigenous biological diversity.

The council may not impose rules in relation to activities in river and lake beds for other purposes, for example cultural, heritage aesthetic or public access reasons. The council may employ other methods, such as policy guidance for discretionary activities or non-regulatory methods to achieve its goals in these areas.

Freshwater Fisheries Regulations 1983

While the RMA takes precedence, the Freshwater Fisheries Regulations 1983 contain legal requirements that aim to protect New Zealand's freshwater fish through provisions surrounding fish passage. Fish passage must then be maintained, unless specific reasons to not do so have been identified and approval is granted. Generally these requirements apply to all structures unless built prior to 1 January 1984 and authorised under the then Water and Soil Act Conservation Act 1967.

6.2 Planning documents

Regional Policy Statement for Northland

The Regional Policy Statement for Northland 2016 specifically recognises (as regionally significant issues) the modification and loss of wetlands (Issues 2.1 and 2.2). It also recognises the values of wetlands for of other issues (for example natural hazards). There are various relevant policies and methods:

1) Promote works to improve wetlands and the vegetated margins (4.2.1, 4.4.1, 4.7.1 and 4.7.3);

2) Protect significant values of wetlands (4.2.2);

3) Minimise disturbance to natural wetlands (4.6.1);

4) Recognise the values of constructed wetlands to manage a range of environmental impacts (4.2.2 and 4.3.5);

5) Regional plan to include controls on use and development of wetlands (4.4.3).

There are no policies or methods in the Regional Policy Statement directly applying to freshwater structures, however, there are various relevant policies and methods relevant to activities involving the beds of rivers and lakes and the damming, diversion and storage of water including:

1) Measures for improving overall water quality (4.2.1, 4.2.2);

2) Water harvesting, storage and conservation (4.3.4); and

3) Maintaining and enhancing indigenous ecosystems and values (4.4.1, 4.4.2, 4.4.3).

Iwi/hapū environmental management plans

Iwi/hapū environmental management plans are planning document recognised by an iwi authority (the authority that represents an iwi and that is recognised by that iwi as having authority to do so). Iwi/hapū environmental management plans may be formal planning documents similar to council policy documents, or they may be a statement of iwi/hapū policies in a less formal and detailed memo or report. Plans may be developed by iwi, hapū or whānau and provide a statement on the position of tangata whenua on a range of issues so that these can be heard and considered by councils and other stakeholders. For more information refer to the the regional council's website – www.nrc.govt.nz/iwiplans.

6.3 Dams, diversions, and fresh water structures

6.3.1 Executive summary

This analysis looks at the management options for the following activities associated with freshwater:

- Dams – this includes off-line water storage reservoirs and dam structures within water bodies and associated water diversion;
- Diversion of water includes stream channel modification; and
- Structures in water include a range of structures in, on, under or over the bed of water bodies, such as stream crossings, piped or cabled utility services and a variety of minor structures such as those associated with some water intakes.

These activities have been considered together because they all either dam or divert water or are placed in, on, under or over the bed of water bodies. They all therefore have potential to affect ecological values such as fish passage and have implications for flows, storm flows and flooding.

The review of the Regional Water and Soil Plan (www.nrc.govt.nz/contentassets/0d3e217aec2346549fdbd0b3e579c501/regional-plan-review--summary---water-quantity.pdf) concluded that the existing approach to these activities is generally good but improvements could be made to:

- Improve design and installation, such as obstructing fish passage and increasing flooding and erosion;
- Introducing requirements to notify council when installing some dams and in-stream structures – to improve environmental monitoring; and
- Making the retrofitting of fish passages in existing structures a permitted activity.

Feedback from the Draft Regional Plan on these provisions was generally supportive.

Three management options were evaluated. The three options were to improve the current regional plan provisions (Option A) and two options that reflect more conservative (Option B) and a more permissive approach (Option C). Option A was assessed as the preferred option.

Option A – the preferred approach (modified status quo)

A permissive approach to off-line water storage, existing activities and small-scale activities outside recognised high value water bodies, that is, outstanding water bodies and significant wetlands.

Activity	Off-line	Streams, rivers, lakes and natural wetlands	Significant areas
Water storage reservoirs and other off-line dams and diversions	Permitted	-	-
Existing structures	-	Permitted	Permitted
Beneficial activities (retrofitting fish passage, demolition and removal of existing structures)	-	Permitted	Permitted
Minor structures	-	Permitted	Non-complying
Small-scale culverts, weirs, fords and bridges		Permitted	Non-complying

Activity	Off-line	Streams, rivers, lakes and natural wetlands	Significant areas
Larger-scale culverts, fords and bridges		Controlled	Non-complying
In-stream dams and diversions	-	Discretionary	Non-complying

6.3.2 Relevant provisions

This evaluation supports the following Regional Plan provisions:

- Rule C.2.1.1 - Introduction or planting of plants in rivers and lakes – permitted activity
- Rule C.2.1.4 - Existing lawfully established structures – permitted activity
- Rule C.2.1.6 - Existing vessel launching and retrieval structures – permitted activity
- Rule C.2.1.7 - Existing mooring structures – permitted activity
- Rule C.2.1.8 - Fish passage structures – permitted activity
- Rule C.2.1.9 - Demolition and removal of existing structures – permitted activity
- Rule C.2.1.10 - Construction and installation of structures – permitted activity
- Rule C.2.1.12 - Freshwater structures – controlled activity
- Rule C.2.1.13 - Structures – discretionary activity
- Rule C.2.1.15 - Structures in a significant area – non-complying activity
- Rule C.2.3 - General conditions
- Rule C.3.1 - Off-stream damming and diversion – permitted activity
- Rule C.3.2 - Small dam – permitted activity
- Rule C.3.3 - Existing in-stream dam – permitted activity
- Rule C.3.4 - Dam maintenance – permitted activity
- Rule C.3.5 - Existing in-stream dam – controlled activity
- Rule C.3.6 - River channel diversion - discretionary activity
- Rule C.3.7 - Damming or diverting water – discretionary activity
- Policy D.2.7 - Managing adverse effects on indigenous biodiversity
- Policy D.4.29 - Wetlands – requirements
- Policy D.4.30 - Wetland – values
- Policy D.4.30 - Freshwater fish
- Policy D.4.32 - Benefits of freshwater structures, dams and diversions

6.3.3 The problem, opportunity and/or requirement

This analysis looks at the management options for the following activities associated with freshwater:

- Dams – this includes off-line water storage reservoirs and dam structures within water bodies and associated water diversion;
- Diversion of water includes stream channel modification;
- Structures in water include a range of structures in, on, under or over the bed of water bodies, such as stream crossings, piped or cabled utility services and a variety of minor structures such as those associated with some water intakes.

These activities have been considered together because they all either dam or divert water or are placed in, on, under or over the bed of water bodies. They all therefore have potential to affect ecological values such as fish passage and have implications for flows storm flows and flooding.

This assessment does not cover the diversion of surface water associated with good erosion and sediment controls for earthworks and land disturbance activities such as clean water diversion channels. This is covered in the land disturbance provisions.

Northland's aquatic biodiversity

One of the main potential impacts of dams, water diversion and structures in water is the impact on aquatic biodiversity.

Northland's freshwater supports a range of aquatic animals including insects, crayfish, snails, worms and records for 35 fish species, this is about half the number found in New Zealand. Similarly, the 21 native freshwater fish species found in Northland represent about half of the New Zealand total of 39 [1]. The region has 13 species 'at risk' of or 'threatened' with extinction (with 10 'at risk' and three 'threatened – nationally vulnerable' on the NZ Threat classification system [2]. General proportions of threatened species are similar to other regions, however, Northland mudfish, dwarf īnanga and dune lake galaxids are only found in Northland and declines in these species affect regional and national freshwater fish diversity and are an indication of wider aquatic ecosystem health.

Swimming and climbing ability varies between native fish species and their different life stages, with some able to climb near vertical wet margins, while others are poor swimmers. More than half the species are diadromous and therefore need to migrate between the sea and freshwater to complete their life cycles. This means that barriers in rivers, streams, and lakes can have a significant impact on the abundance of fish in affected lakes and rivers. Indigenous fish are generally most abundant in streams in hilly or mountainous country and where there is extensive riparian vegetation, rather than large rivers in lowland areas. This is probably because these areas are less affected by human activities [3].

Predicted climate change

An increased frequency of droughts and less annual rainfall is likely to drive demand for water storage and damming, and affect the vulnerability of river structures to damage. The most recent predictions on the effects of climate change [4] and [0]Ministry for the Environment, Climate change projections for the Northland region [5] include more frequent droughts resulting from a rise in temperature and decreased annual rainfall, but also an increase in extreme rainfall events.

Damming and water storage

Demand for damming and water storage will inevitably increase. Known issues with dams include:

- In-stream dams can prevent fish passage and reduce stream habitat;
- Dams and storage reservoirs that recharge at any time from rivers or overland flow can extend low flow conditions in streams and reduce supply for downstream water users (particularly where there is a high level of allocation or flow sensitivity);
- The cumulative effects of dams on in-stream ecology is not well understood and potentially significant;
- Dams over a certain size require a building consent. There can be confusion as to when a building consent and/or resource consent is required (particularly if the thresholds are different).

These regional plan provisions for dams aim to avoid significant adverse effects on the flows and aquatic ecology (including indigenous wetlands and allowance for fish passage). In addition, 5 'Water quantity' and 4.10 'Land disturbance activities' provisions manage the use of dammed water and effects from large scale earthworks during construction. The effects of the largest dams are generally well understood and managed as highlighted in the plan review report. However, the regional

1 *Goodman J. M., Dunn N. R., Ravenscroft P. J., Allibone R. M., Boubee J. A. T., David B. O., Rolfe J. R., 2014. New Zealand Threat Classification Series 7. Wellington: Department of Conservation.*

2 *http://www.doc.govt.nz/nztcs*

3 *Brown M. A., Stephens R. T., Peart R., and Fedder B., 2015. Vanishing nature: Facing New Zealand's biodiversity crisis. Auckland: Environmental Defence Society.*

4 *Predictions are taken from the 5th report from the Intergovernmental Panel on Climate Change and although they have not been refined specifically for Northland, they are the best information we currently have for future planning. The report does however refer especially to New Zealand and general areas within New Zealand.*

5 *www.mfe.govt.nz/climate-change/how-climate-change-affects-nz/how-might-climate-change-affect-my-region/northland*

council only has information on around 300 dams and there are likely to be 10 to 20 times that number in total of mostly smaller dams. Currently there is no requirement to notify council when constructing permitted dams. The impacts of these dams in catchments that are under allocated are not likely to be a major problem, however in over allocated catchments the risk is higher.

The current Regional Water and Soil Plan for Northland uses dam capacity (20,000m^3) and crest height (3m) as management thresholds which corresponded with the Building Act 1991 triggers at the time. These have since changed to 20,000m^3 and 4m and may change further. Generally the holding capacity of a dam has greatest influence on environmental effects rather than dam height.

We currently don't have the information to clearly define a permitted activity dam volume threshold for off-line dams. The current permitted activity threshold volume of 20,000m^3 only applies to existing dams. This is also the same volume that triggers a building consent.

Dam safety regulations that were due to come into force on 1 July 2015 were revoked as ministers considered them too onerous. Government has signalled that future dam safety functions/regulations/guidelines may fall under the RMA and regional council's functions.

Diversions and drainage

Most diversion activities are associated with earthworks and involve temporary stormwater diversion. Other diversions include stream channel realignment and straightening, and coastal water diversions.

Structures

Structures in freshwater bodies include:

Stormwater outlets	Moorings	Weirs	Fences
River protection works and structures	Pipelines	Jetties	Bridges
River monitoring structures	Wharves	Cables	Culverts
Fish and Game NZ structures	Water intakes	Fords	Ramps

The Regional Water and Soil Plan takes a relatively permissive approach to most structures (culverts, weirs, fords, bridges etc.) in water bodies that do not involve a listed dune lake, outstanding water body, or indigenous wetland. However, without appropriate design and installation adverse effects can occur including:

- Impacts from changed flows including river diversion, damming and blockage;
- Increased bed erosion, sedimentation and contaminant discharges;
- Restriction of public access;
- Obstruction of fish and invertebrate passage;
- Increased flooding on neighbouring property;
- Interference with historic heritage or culturally significant sites; and
- Impact on natural features, natural character or landscape values.

Currently there is no requirement to notify council when installing permitted in-stream structures and as a result comparatively large-scale works are permitted with no checks on the appropriateness of culvert capacity and other design details, such as allowing for fish passage. The scale of this issue in Northland is not well understood, however in the Auckland region where there has been greater control over in-stream structures, the most common artificial barriers to indigenous fish are badly positioned or undersized culverts [(6)].

The Resource Management (National Environmental Standards for Plantation Forestry) Regulations 2017 introduces new rules for a range of structures in water bodies relating to forestry activities. In developing rules in the regional plan we have focused on activities outside the plantation forestry industry.

6.3.4 Management options

This section summarises the management options for dams, diversions and structures. The intention is not to identify every different combination of approach as there would be many, but to represent the range of options and highlight key differences in approaches.

We don't think there is a need to dramatically change the general overall approach to these activities in the current Regional Water and Soil Plan, as there is no evidence of any significant issue with the current approach. In particular:

- Permitting most small-scale minor activities;
- Providing for fish passage; and
- Providing a higher level of protection to water bodies with recognised high value.

However, the current provisions do not:

- Provide council with location or design data for permitted structures;
- Provide clarity on permitted retrofitting of fish passage to existing structures; and
- Provide a clear benchmark storm event for structures to be designed to withstand.

The Resource Management (National Environmental Standards for Plantation Forestry) Regulations 2017 were released 31 July 2017 and cover a range of activities associated with plantation forestry. The national standard's provisions include rules for stream crossings and the regional plan can not be more lenient than the requirements of the national standards. Where these standard's apply to stream crossing provisions they have generally carried through to option A in order to and provide for greater consistency in the approach elsewhere. These regulations use modelled probability of fish presence and spawning indicator tools (footnote) in their approach towards protecting fish species values. This plan includes Policy D.4.29 that seeks consideration of fish present and spawning habitat in acknowledgement of the regulations approach towards protecting these values.

Fish Spawning Indicator: www.mpi.govt.nz.

Key terms

The following is an explanation of the key terms used in describing the options:

In-stream = activities located within intermittently flowing or perennial, streams and rivers and lakes.

Off-stream = activities that intercept surface water flows and are not located within intermittently flowing or perennial, streams and rivers and lakes.

Intermittently flowing streams and rivers

A river that is naturally dry at certain times of the year and has two or more of the following characteristics:

1) it has natural pools,

6 *Stevenson C. and Baker C., 2009. Fish Passage in the Auckland Region – a synthesis of current research. Prepared by NIWA for Auckland Regional Council. Auckland Regional Council Technical Report 2009/084.*

2) it has a well-defined channel, such that the bed and banks can be distinguished,

3) it contains surface water more than 48 hours after a rain event which results in river flow,

4) rooted terrestrial vegetation is not established across the entire cross-sectional width of the channel, and

5) it appears as a blue line on topographical maps at 1:50,000 scale.

River bed width measurement

This uses the RMA section 2 definitions for 'bed' and 'river' and the width measurement corresponds to the space of land which the waters of the river cover at its annual fullest flow and without over-topping its banks. The 'annual fullest flow' equates to the Mean Annual Flood level, which is quantified as a flood event with an Average Recurrence Interval (ARI) of about 2.3 years. [7]

Minor structures

These are structures with low potential for adverse effects such as impact on fish passage, other ecological values, flood flows, and erosion. Such structures include telecommunications, power lines, other pipelines, Fish and Game NZ structures, water intakes for permitted water takes, and fences.

Significant areas

For the purpose of this assessment areas with identified high values have been grouped together and include significant wetlands, Outstanding Freshwater Bodies, Outstanding Natural Character Areas, Outstanding Natural Features, Historic Heritage Areas and Sites or Areas of Significance to Tangata Whenua. With the exception of significant wetlands, maps of these areas have been included in this Plan. Significant wetlands are identified through criteria and indicated on council website maps that are being continually updated.

Activity status

Permitted, Controlled, Restricted discretionary, Discretionary, and Non-complying.

Management options

Option A – the preferred approach (modified status quo)

Overview: a permissive approach to off-line water storage, existing activities and small-scale activities outside recognised significant areas (refer to Maps in this plan).

*Background:*this is the approach taken in the current regional plans with additional updates and closer alignment with the stream crossing provisions in the Resource Management (National Environmental Standards for Plantation Forestry) Regulations 2017.

Activity	Off-stream	Streams, rivers, lakes and natural wetlands	Significant areas
Water storage reservoirs and other off-line dams and diversions.	Permitted	-	-
Existing structures and small dams.	-	Permitted	Permitted
Beneficial activities (retrofitting fish passage, demolition and removal of existing structures).	-	Permitted	Permitted
Minor structures.	-	Permitted	Non-complying
Small-scale culverts, weirs, fords and bridges.	-	Permitted	Non-complying

7 *The measurement was tested in Whitby Estates Limited versus Porirua City Council W61/2008, also known as the 'Duck Creek' case.*

Activity	Off-stream	Streams, rivers, lakes and natural wetlands	Significant areas
Larger-scale dams (existing), culverts, fords and bridges.	-	Controlled	Non-complying
In-stream dams and diversions.	-	Discretionary	Non-complying

Option B – permissive approach

Overview: a permissive approach to most activities except for new structures and dams in higher value water bodies.

*Background:*this is a more hands off management approach for council and a benchmark from which to gauge option A. The option is more aligned with the preferred approach promoted by primary industries that generally seeks a reduced level of regulation.

Activity	Off-stream	Streams, rivers, lakes and Natural wetlands	Significant areas
Water storage reservoirs and other off-line dams and diversions.	Permitted	-	-
Existing structures and small dams.	-	Permitted	Permitted
Beneficial activities (retrofitting fish passage, demolition and removal of existing structures).	-	Permitted	Permitted
Minor structures.	-	Permitted	Discretionary
Small-scale culverts, weirs, fords and bridges.	-	Permitted	Discretionary
Larger-scale dams (existing), culverts, fords and bridges.	-	Controlled	Discretionary
In-stream dams and diversions.	-	Restricted discretionary	Discretionary

Option C – stringent approach

Overview: resource consent required for all activities except for the very minor. Strongly discouraging of activities in significant wetlands and outstanding water bodies.

*Background:*this approach provides for greater council control of activities and a benchmark from which to gauge option A. It is a more environmentally conservative approach.

Option C – stringent approach:

Activity	Off-stream	Streams, rivers, lakes and Natural wetlands	Significant areas
Water storage reservoirs and other off-line dams and diversions.	Controlled	-	-
Existing structures and small dams.	-	Controlled	Discretionary

Activity	Off-stream	Streams, rivers, lakes and Natural wetlands	Significant areas
Beneficial activities (retrofitting fish passage, demolition and removal of existing structures).	-	Controlled	Discretionary
Minor structures.	-	Controlled	Non-complying
Small-scale culverts, weirs, fords and bridges.		Restricted discretionary	Non-complying
Larger-scale dams (existing), culverts, fords and bridges.		Restricted discretionary	Non-complying
In-stream dams and diversions.	-	Discretionary	Non-complying

6.3.5 High level objectives and measures

Section 32 requires an assessment of "*...the efficiency and effectiveness of the provisions in achieving the objectives...*". Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section 1.6 'Evaluation approach' for more details.

'High level objectives':

- Capture the fundamental things (or values) that matter to people (the key costs and benefits) when determining the best management option;
- Signal a direction for where we want to head, without stating how far we go; and
- Are what the management options are assessed against to determine their efficiency and effectiveness (s32(1)(b)(ii)).

Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against.

Key outcomes and measures

High level objective	Measure
Minimise adverse effects on aquatic ecosystems and other water body users.	Ability to practicably control (avoid or mitigate) adverse effects including over-allocation: 1 = minor control (only limited control of likely adverse effects). 2 = moderate control (control on the more significant adverse effects). 3 = significant control (control of all likely adverse effects). 4 = full control (impossible that adverse effects could occur).
Minimise the level of regulatory costs for good water body management, enabling appropriate storage / access to water for social/economic well-being.	Costs associated with resource consent applications: • Permitted activity = not applicable ($0). • Controlled (typically non-notified) = $839. • Discretionary or non-complying (typically limited or fully notified) = $3144. • Prohibited = not applicable ($0).

High level objective	Measure
	Notes: costs do not include those associated with preparing the application or hearing costs and costs may be higher if these fees don't cover the costs.

Minimise adverse effect on aquatic ecosystems and other water body users

This measure looks at the ability to control adverse effects. Control can be by way of conditions of a rule or the level of discretion or control council has when processing resource consents. We have used a constructed measure to assess whether the management options are likely to practicably control (avoid or mitigate) adverse effects in terms of the disturbance of water bodies and impacts on other water users. A constructed measure has been used because it is very difficult to quantify the actual and potential adverse effects of any particular management option.

Minimise the level of regulatory costs to good water body management and land owners who want to establish new dams, structures and diversion

This objective is to minimise administrative costs associated with applying for resource consent and to enable appropriate storage / access to water for social/economic well-being.

Costs are typically proportionate to the level of rigour needed in the preparation and consideration of an environmental impact assessment and the nature of ongoing monitoring and reporting requirements. The costs quoted are from the council the charging policy (www.nrc.govt.nz/Consents/Consent-Forms-and-Fees/) and do not include application preparation costs.

High level objectives not included

Section 32 requires an assessment of the impacts on economic growth and employment opportunities (s32(2)(a)). However, the impact of the management options on economic growth and employment opportunities is imperceivable and/or can't be determined with any confidence. Therefore, economic growth and employment opportunities have not been included as high level objectives. For more information go to the section *'1.7 'Assessing impacts on economic growth and employment opportunities''* .

6.3.6 Evaluating the management options

High level objective and measure	Activity	Option A – the preferred approach (modified status quo)	Option B – permissive approach	Option C – stringent approach
Minimise adverse effects on aquatic ecosystems and other water body use. *Measure* Ability to practicably control (avoid or mitigate) adverse effects including over-allocation: 1 = minor control (only limited control of likely adverse effects);	Off-stream storage	1	1	2
	In-stream dams	3	2	3
	Minor structures	1	1	2
	Larger structures	2	2	3
	In-stream structures in significant areas	3	2	3

High level objective and measure	Activity	Option A – the preferred approach (modified status quo)	Option B – permissive approach	Option C – stringent approach
2 = moderate control (control of the more significant adverse effects only); 3 = significant control (control of all likely adverse effects); 4 = full control (impossible that adverse effects could occur).				
	Total score	10	8	13
Minimise the level of regulatory costs for good water body management and to land owners who want to establish new dams, structures and diversion. *Measure* Costs associated with resource consent applications: • Permitted activity = not applicable ($0); • Controlled (typically non-notified) = $839; • Restricted discretionary (typically non-notified and simple) = $839 • Discretionary or non-complying (non-notified but can be complex) = $1678; • Non-complying (typically limited or fully notified) = $3144; • Prohibited = not applicable ($0).	Off-stream storage	$0	$0	$839
	In-stream dams	$1678	$839	$1678
	Minor structures	$0	$0	$839
	Larger structures	$839	$839	$839
	In-stream structures in significant areas	$3144	$1678	$3144
	Total cost	$5661	$3356	$7339

Certainty about the evaluation

There is always uncertainty about the potential impacts of management options. We have relatively equal degree of confidence in the outcomes for each option. While there is some uncertainty over the degree adverse effects are likely to be minimised and the scale of regulatory costs, these measures still provide a useful comparison between the three options.

We have included comparison of the different approaches the options take to activities affecting special sites - outstanding water bodies and significant wetlands.

We're confident that the evaluation is accurate enough to make a decision on the preferred option. We don't think it would be viable and/or worthwhile to get more information to increase the accuracy of our evaluation as it's unlikely to change the relative differences between the options.

Time-frame of the evaluation

The evaluation is made over the life-time of the plan (10-15 years).

The preferred management option

The preferred management option for the proposed Regional Plan is Option A: which is a modified status quo approach.

Option A is preferred because it:

- Allows land owners and infrastructure providers to undertake a range of activities associated with freshwater infrastructure;
- Safeguards freshwater habitat from significant adverse effects and protects the values of outstanding water bodies and significant wetlands;
- Encourages off-stream water storage; and
- Continues a similar regulatory cost regime.

Option C offers the highest level of control and ability to minimise adverse effects of development, however it does so with significantly increased regulatory costs and may discourage some beneficial activities.

The more permissive Option B is least favoured, as it provides reduced control over adverse effects with comparable regulatory costs to Option A.

6.4 Wetlands

6.4.1 Executive summary

The RMA defines wetlands as:

> *"...includes permanently or intermittently wet areas, shallow water, and land water margins that support a natural ecosystem of plants and animals that are adapted to wet conditions."*

Wetlands are recognised as important features in the landscape that provide numerous beneficial services for people, fish and wildlife. Some of these services, or functions, include protecting and improving water quality, providing biodiversity values, reducing flood flows, and maintaining surface water flow during dry periods.

In pre-human times wetlands covered about 32% of Northland and now only about 1% of Northland is wetland[8]. Therefore those left are important both because of the beneficial functions they perform and for their values to nature.

Council has currently mapped approximately 400 square kilometre of wetlands, representing about three percent of Northland. Over half of the mapped wetland area is located on public land such as conservation estate, coastal marine area and reserves. Around 25 percent of mapped wetlands are located on grazing land and about 10 percent within the exotic forestry estate. There are approximately 2000 land owners owners with mapped wetland on their property.

Northland's remnant wetlands include some relatively large inland wetlands, such as Hikurangi Swamp and the Motatau Wetlands. A number of wetlands associated with dune and gumland areas and adjoining the coast are considered habitats of international significance. The values of remaining wetlands have increasing significance with continued loss and degradation.

Many of Northland's wetlands with the most significant biodiversity values have been mapped. Significance criteria have been refined to improve identification of currently unmapped wetlands with significant biodiversity values.

The review of the current regional plans [9] concluded that the existing approach to wetlands in the regional plans is generally good but improvements could be made to better:

- Identify wetlands, particularly those with significant values;
- Encourage activities that benefit wetlands; and
- Recognise wetland resilience.

The Draft Regional Plan feedback provided useful detail on a number of provisions and was generally supportive of the overall approach.

Limitations on stock access to wetlands is covered under the water quality section of this report 4.9 'Exclusion of livestock from water bodies and the coastal marine area'.

Three management options were evaluated. The three options were to improve the current regional plan provisions (Option A) and two options that reflect more conservative (Option B) and a more permissive approach (Option C). Option A was assessed as the preferred option.

8 *refer to the Landcare Research wetland maps at http://ourenvironment.scinfo.org.nz/ourenvironment*

9 *Refer to the regional council's website for more information: www.nrc.govt.nz/Your-Council/Council-Projects/New-Regional-Plan/10-year-review-of-the-regional-plans/*

Option A – the preferred approach (modified status quo):

Activity	Significant wetland	Natural wetland	Constructed wetland
Weed control, planting and fencing (meeting conditions).	Permitted	Permitted	Permitted
Wetland construction, alteration or extension.	Non-complying	Discretionary	Permitted
Wetland removal.	Non-complying	Discretionary	Permitted
Activities not meeting permitted or controlled activities.	Non-complying	Discretionary	Discretionary

Note: all 'permitted' and 'controlled' activities are subject to conditions. If an activity does not meet any of these conditions it will need a restricted discretionary, discretionary consent or non-complying.

This includes policy recognising 'offsetting'; other functions and values of wetlands and ability to take a different approach to low value induced and reverted wetlands.

6.4.2 Relevant provisions

This evaluation supports the following Regional Plan provisions:

- Rules C.2.2 - Activities affecting wetlands
- Policy D.2.7 - Managing adverse effects on indigenous biodiversity
- Policy D.4.15 - Minimum levels for lakes and wetlands
- Policy D.4.29 - Wetlands – requirements
- Policy D.4.30 - Wetlands – values
- Policy D.4.31 - Freshwater fish
- Policy D.4.22 - Requirements for structures in freshwater
- Policy D.4.32 - Benefits of freshwater structures, dams and diversions

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6.4.3 The problem, opportunity and/or requirement

As a result of historical activities, the vast majority of Northland's wetlands have been lost and those that remain suffer continued degradation due to surrounding land use, drainage and incursion of pests. In pre-human times wetlands covered about 32% of Northland and now only about 1% of Northland is wetland[(10)]. Therefore those left are important both because of the beneficial functions they perform and for their values to nature.

Predicted continuation of sea level rise is likely to increase pressure on coastal wetlands through a process known as 'coastal squeeze' where landward migration of sea levels encounters obstructions and results in reduced habitat area. Similarly predicted increased drought and severe rainfall events associated with climate change, will place greater reliance and pressure on remaining wetlands to maintain low stream flows, filter increased sediment levels and mitigate peak storm flows.

10 *refer to the Landcare Research wetland maps at http://ourenvironment.scinfo.org.nz/ourenvironment*

Remaining wetlands therefore have significant value and despite strong current regional plan controls on drainage and diversion, wetlands continue to be modified and lost. Unauthorised wetland damage and loss associated with swamp kauri extraction is a case in point. The current rules around indigenous wetlands can also actually discourage good management of wetlands, and current definitions can be problematic and confusing, therefore these need to be clarified.

Significant values that wetlands may have relate to native biodiversity, buffering effects of peak and low water flows, water purification, fisheries, recreation and landscape, culture, including places used for fibre and food resources, burial sites and areas associated with taniwha.

There is opportunity to better encourage beneficial activities, such as creating, maintaining and restoring wetlands and we need to balance the protection of wetlands while not inhibiting these beneficial activities. There is also a need to consider potential conflicts between protection measures for different values (for example, a biodiversity value may be protected by preventing contaminated water entering wetlands, while a water purification value could promote allowing such flows to enter and maintain a wetland).

Therefore, while it is necessary to protect significant biodiversity values of wetlands, the new plan provisions also need to recognise and promote functions and values provided by wetlands in a way that continues to protect significant biodiversity values and enables beneficial activities such as wetland restoration, creation and on-going management.

It is also necessary to apply criteria to determine which wetlands are significant.

The new Regional Policy Statement provides improvements to wetland definitions through a set of biodiversity significance criteria (see Appendix 1 – wetland types and significance criteria). These criteria exclude man-made (constructed) wetlands and distinguish between different wetland types (for example, swamp, saltmarsh, gumland, bog) based on their rarity and size. Indigenous wetlands that meet the thresholds below are ecologically significant (note: the current Regional Water and Soil Plan definition makes indigenous wetlands over 50m^2 significant):

a) Saltmarsh greater than 0.5 hectares; or

b) Shallow water (lake margins and rivers) less than 2m deep and greater than 0.5 hectares; or

c) Swamp greater than 0.4 hectares; or

d) Bog greater than 0.2 hectares; or

e) Pakihi (including gumland and Ironstone heathland) greater than 0.2 hectare in area; or

f) Marsh; fen; ephemeral wetlands or seepage/flush greater than 0.05 hectares.

These area thresholds can be applied to known wetlands that have been mapped to highlight where there are most likely to be significant wetland values, and where different rules are likely to apply.

To assist with wetland management and recognise or provide for areas of significant indigenous vegetation and significant habitats of indigenous fauna a key tool is to map them. [(11)] Northland Regional Council holds a database consisting mostly of wetlands:

- Identified through the Department of Conservation Protected Natural Area programme (usually as having significant biodiversity values);
- Encountered through day-to-day council activities;
- Clearly visible on council's aerial imagery; and
- Constructed wetlands.

These wetlands have now been mapped and represent the majority of Northland's total wetland area and consist mostly of the largest wetlands. It is not currently practical to either map all wetlands or identify all known wetlands meeting the significance criteria. This is because aerial imagery available to council is of insufficient resolution and some wetlands require field testing as they can be very similar to non-wetland vegetation types.

11 *Royal Forest and Bird Protection Society of New Zealand Inc versus New Plymouth District Council, Environment Court, Wellington. Judgement date 17/12/2015 Court File number ENV-2014-WLG-56.*

We considered including maps of just wet heathlands (pakihi or gumland) greater than 0.2ha in area to indicate where these are likely to meet the significant wetland definition. These wetlands are more stable than other wetlands, require specific soil conditions that can be permanently lost through changes in land management. We were unable to produce sufficiently accurate maps in time for this Plan, but when available these maps would provide greater certainty in the identification of these particularly vulnerable wetlands.

There is a range of national and regional policy supporting the values of wetland values:

National Policy Statement for Freshwater Management – policy	New Zealand Coastal Policy Statement – policy	Operative Regional Policy Statement – policy	Policy direction	Connection to wetland functions, values (or new plan rules)
A3(b), B1	22, 23	*4.2.1*	Minimise likely adverse effects of discharges and improving overall water quality.	Wetlands can significantly reduce contaminant levels particularly associated with capture of sediments.
	3, 26		Climate change and natural hazard resilience.	Wetlands provide resilience to extreme weather events (particularly draughts and high rainfall) predicted to become more frequent as a result of climate change. They can also provide 'natural' defences that help to protect coastal land uses from coastal hazards.
C1 and C2	6	*4.3.4,* *5.3.3,* *7.1.1*	Recognise other activities and integrate management. Including water storage and harvesting.	Recognition of man-made/constructed wetlands constructed for treatment purposes.
	11(a)	4.4.1 and significance criteria	Protect significant biodiversity.	Wetlands over default area thresholds will trigger significance. Recognise the need for ongoing management of constructed wetlands built for treatment purposes.
	11(b)		Avoid significant effects and minimise other effects on biodiversity.	Recognise inherent values of wetlands and provide for no net loss through providing for offsetting and compensation.
		4.4.2, 8.1.1-4	Support voluntary efforts of land owners and community groups, iwi and hapū, to achieve ecological integrity and recognise cultural values.	Promotion of wetland creation, restoration and management.

The Convention on Wetlands of International Importance, called the Ramsar Convention and ratified by New Zealand, requires that all wetlands be managed to maintain their ecological integrity.

The NZ Biodiversity Strategy established goals, a framework for action and priorities for action including maintaining the net extent and condition of natural wetlands by 2020 and some degraded or scarce wetlands are restored or increased in area.

6.4.4 Management options

This section summarises the management options for wetlands. The intention is not to identify every different combination of approach as there would be many, but to represent the range of options and highlight key differences in approaches.

We don't think there is a need to dramatically change the general overall approach to wetlands in the current Regional Water and Soil Plan and Coastal Plan. In particular:

- Permitting most activities in man-made / constructed wetlands;
- Distinguishing between natural wetlands with native vegetation and those with mostly exotic plant species; and
- Providing a higher level of protection to the wetlands with highest biodiversity value.

However, our current provisions do not:

- Allow for beneficial activities that may have some short-term minor effects;
- Promote wetland creation;
- Take a clear approach to stock access in different wetland types; or
- Provide policy that considers a range of wetland values.

Therefore, regardless of the management option chosen, the new Regional Plan will include:

- A less precautionary approach to significant wetlands (due to the new size-based criteria/thresholds).
- Policy to clarify what is (and is not) good wetland management.
- Positive management actions such as wetland restoration, enhancement and creation (equals a permitted activity).

Criteria in the Regional Policy Statement include thresholds to help determine the significance of wetlands.

- Recognition of beneficial wetland functions.
- Reference to maps to indicate known wetland locations and likelihood of significant biodiversity values.

Key terms relating to wetlands

Wetland mapping

Council's wetland mapping indicates the extents of known wetlands (constructed, natural and significant) and is available on the council's website. The purpose of this mapping is to help locate and identify different wetland types and this mapping does not form a statutory management zone in the regional plan.

Man-made / Constructed wetland (based on Regional Policy Statement Appendix 5 definition)

These are wetlands developed deliberately by artificial means or have been constructed on sites where:

a) Wetlands have not occurred naturally previously; and

b) The current vegetation cover cannot be delineated as indigenous wetland; or

c) Constructed wetlands have been previously constructed legally.

Constructed wetlands do not include induced wetlands; reverted wetlands or wetlands created for conservation purposes, for example, as a requirement of resource consent. Examples of constructed wetlands include wetlands created and subsequently maintained principally for or in connection with:

a) Effluent treatment and disposal systems; or

b) Stormwater management; or

c) Artificial water storage facilities, detention dams, reservoirs for firefighting, domestic and community water supply; or

d) Other artificial wetlands and water bodies including or open drainage channels (that have been legally established) such as those in drainage schemes) and engineered soil conservation structures.

These may contain emergent indigenous vegetation such as mangroves, rushes and sedges.

Note: council's wetland mapping indicates the extents of known wetlands – see wetland mapping.

Natural wetland

Any wetland whether or not it is dominated by indigenous vegetation provided it is not:

1) A '*constructed wetland';* or
2) Wet pasture, damp gully heads, or where water temporarily ponds after rain or pasture containing patches of rushes.

Induced wetlands

These are wetlands that have formed naturally on ecological sites where wetlands did not previously exist, as a result of human activities such as construction of roads, railways, bunds etc. While such wetlands have not been constructed for a specific purpose, they can be considered to be artificial in many cases given they arise through physical alteration of hydrology through mechanical human modification.

These wetlands should not be excluded from natural wetland or significant wetland classification but when recently induced, are likely to have limited biodiversity value.

Reverted wetlands

Where a wetland reverts over time (for example, stock exclusion allows a wetland to revert to a previous wetland state). In this instance, the wetland has not been purposefully constructed by mechanical change to hydrological conditions. These wetlands should not be excluded from natural wetland or significant wetland classification but when recently reverted, may have limited biodiversity value.

Significant wetland

A natural wetland that triggers significance criteria in the Regional Policy Statement Appendix 5 – Areas of significant indigenous vegetation and significant habitats of indigenous fauna in terrestrial, freshwater and marine environments.

This includes wetlands comprising greater than 50% indigenous vegetation, wider than five metres and exceeding any of the following area thresholds:

1) Saltmarsh greater than 0.5 hectare in area; or
2) Shallow water (lake margins and rivers) less than 2m deep and greater than 0.5 hectares in area; or
3) Swamp greater than 0.4 hectares in area; or
4) Bog greater than 0.2 hectares in area; or
5) Wet heathlands greater than 0.2 hectares in area; or
6) Marsh; fen; ephemeral wetlands or seepage/flush greater than 0.05 hectares in area.

Note: if there is any doubt over wetland extent use: *"A vegetation tool for wetland delineation in New Zealand"* by Landcare Research, March 2014. Council's wetland mapping indicates the extents of known wetlands – see wetland mapping.

Management options

Option A – the preferred approach (modified status quo)

Overview: this option is similar to the current approach, however, it recognises beneficial activities for wetlands.

*Background:*this option recognises the on-going need to provide a high level of protection for significant values of wetlands as required by RMA section 6(c) and reflected by the National Policy Statement for Freshwater Management objective A2. This is achieved through activity status being linked to wetland ecological values, where constructed wetlands are allocated the lowest value and significant wetlands the highest, where activities likely to have adverse effects on:

- Significant wetlands are non complying; and
- Natural wetlands are discretionary; and
- Constructed wetlands are permitted.

Activities likely to have overall benefits to wetland values such as wetland enhancement and restoration are generally permitted.

This option includes policy recognising wetland functions and values, biodiversity offsetting and ability to take a different approach to low value induced and reverted wetlands.

Option A – the preferred approach (modified status quo):

Activity	Significant wetland	Natural wetland	Constructed wetland
Weed control, planting and fencing (meeting conditions).	Permitted	Permitted	Permitted
Wetland construction, alteration or extension.	Non-complying	Discretionary	Permitted
Wetland removal.	Non-complying	Discretionary	Permitted
Activities not meeting permitted or controlled activities.	Non-complying	Discretionary	Discretionary

Note: all 'permitted' and 'controlled' activities are subject to conditions. If an activity does not meet any of these conditions it will need a restricted discretionary, discretionary or non-complying consent.

Option B – permissive approach

Overview: this option allows for a greater degree of wetland modification than option A, while also recognising beneficial activities for wetlands.

*Background:*with this option significant values of wetlands can be provided for however the council has less discretion than option A. Where activities are likely to have adverse effects on:

- Significant wetlands they are discretionary; and
- Natural wetlands they are controlled.

Otherwise activities are permitted, as with option A. This option defers to default minimum RMA requirements and avoids additional policy direction.

Option B – permissive approach:

Activity	Significant wetland	Natural wetland	Constructed wetland
Weed control, planting and fencing (meeting conditions).	Permitted	Permitted	Permitted

Activity	Significant wetland	Natural wetland	Constructed wetland
Wetland construction, alteration or extension.	Controlled	Permitted	Permitted
Wetland removal.	Discretionary	Controlled	Permitted
Activities not meeting permitted or controlled activities.	Discretionary	Restricted discretionary	Restricted discretionary

Note: all 'permitted' and 'controlled' activities are subject to conditions. If an activity does not meet any of these conditions it will need a restricted discretionary, discretionary or non-complying consent.

Option C – stringent approach

Overview: this option takes a more precautionary approach than option A, requiring resource consent for almost all activities affecting wetlands.

*Background:*this option places greater emphasis than option A on council controlling a wide range of activities with potential to affect wetlands (including those intended to benefit wetland). The aim of this approach would be to provide greater certainty over outcomes and an increased level of wetland protection. Where activities are likely to effect:

- Significant wetlands they are non complying; and
- Natural wetlands they are discretionary or non-complying; and
- Constructed wetlands they are permitted or controlled.

This option includes restrictive policy requiring strict preservation of biodiversity values and heavy weighting on biodiversity matters over other considerations. Very limited options for offsetting.

Option C – stringent approach:

Activity	Significant wetland	Natural wetland	Constructed wetland
Weed control, planting and fencing (meeting conditions).	Restricted discretionary	Controlled	Permitted
Wetland construction, alteration or extension.	Non-complying	Discretionary	Controlled
Wetland removal.	Non-complying	Non-complying	Controlled
Activities not meeting permitted or controlled activities.	Non-complying	Non-complying	Discretionary

Note: all 'permitted' and 'controlled' activities are subject to conditions. If an activity does not meet any of these conditions it will need a restricted discretionary, discretionary or non-complying consent.

6.4.5 High level objectives and measures

Section 32 requires an assessment of "*...the efficiency and effectiveness of the provisions in achieving the objectives...*". Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section 1.6 'Evaluation approach' for more details.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. They also signal a direction for where we want to head, without stating how far we go – that comes later (they are the beginnings of objectives).

Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against.

High level objectives	Measure
Minimise net loss in area and condition of wetlands in Northland.	Degree of control over wetland loss compared to the current level. +2 = moderately greater control. +1 = small increase in control. The current rate = 0. -1 = small decrease in control. -2 = moderately decreased control.
Enable beneficial wetland management.	Level of impediment and resource consent application costs (see ***Note*** below): • Permitted activity = low impediment and $0 application fee. • Controlled (typically non-notified and simple) = small impediment $839. • Restricted discretionary (typically non-notified and simple) = small impediment $839. • Discretionary (typically non-notified but can be complex) = moderate impediment $1678. • Non-complying (typically limited or fully notified) = significant impediment $3144. • Prohibited = not applicable ($0).

Note: costs may be higher as these fees don't cover the costs. Costs do not include those associated with preparing the application or hearing costs, and a doubling factor has been used to recognise additional complexity of discretionary activities.

Minimise net loss in area and condition of wetlands in Northland

Cumulatively activities such as drainage and diversion reduce the extent of wetlands in Northland. The condition of remaining native wetlands is also degrading through disturbance of native plant species that leads to establishment of pest species. The current rates of loss and degradation are not currently known. Therefore, the measure used compares the degree of control over wetland loss (activity status) compared to the current level. Stakeholder workshops held as part of the review of the current regional plansand draft plan feedback [12] indicated that land owners find it discouraging when there is a need for resource consent for activities such as enhancement and restoration works that are beneficial to wetlands but that may involve short-term disturbance. In reflection of this, where options permit such activities, there is greater likelihood of increased wetland area.

Enable beneficial wetland management

12 *For further details refer to the regional council's website: www.nrc.govt.nz*

This measures seeks to compare options that encourage good management practice, through the degree of regulation for each option. It assumes these activities do not result in reduced wetland area and therefore enjoy a lower activity status than activities causing permanent wetland loss.

High level objectives not included

Section 32 requires an assessment of the impacts on economic growth and employment opportunities (s32(2)(a)). However, the impact of the management options on economic growth and employment opportunities is imperceivable and/or can't be determined with any confidence. Therefore, economic growth and employment opportunities have not been included as high level objectives. For more information go to the section 1.7 'Assessing impacts on economic growth and employment opportunities'.

6.4.6 Evaluating the management options

High level objective and measure	Activity/wetland	Option A: Preferred	Option B: Permissive	Option C: Strict
Minimise net loss in area and condition of wetlands in Northland. *Measure*: Degree of control over wetland loss compared to the current level: +2 = moderately greater control. +1 = small increase in control. The current level = 0. -1 = small decrease in control -2 = moderately decreased control	Enhancement works	-2	-2	-1
	Constructed wetlands	-1	-2	+1
	Natural wetlands	-1	-2	0
	Significant wetlands	0	-1	0
	Overall average rating	**-1**	**-2**	**0**
Enable beneficial wetland management. *Measure:* Level of impediment / resource consent application costs (see Note below): • Permitted activity = low impediment and $0 application fee. • Controlled (typically non-notified and simple) = small impediment $839. • Restricted discretionary (typically non-notified and simple) = small impediment $839. • Discretionary (typically non-notified but can be	Constructed wetlands	$0	$0	$839
	Natural wetlands	$1678	$839	$1678
	Significant wetlands	$3144	$839	$3144
	Total cost	**$4822**	**$1678**	**$5661**

High level objective and measure	Activity/wetland	Option A: Preferred	Option B: Permissive	Option C: Strict
complex) = moderate impediment $1678. • Non-complying (typically limited or fully notified) = significant impediment $3144. • Prohibited = not applicable ($0).				

Note: costs may be higher if these fees don't cover the costs. Costs do not include those associated with preparing the application or hearing costs, and a doubling factor has been used to recognise additional complexity of discretionary activities.

Certainty about the evaluation

There is always uncertainty about the potential impacts of management options. However, we have relatively equal degree of confidence in the outcomes for each option.

We're confident that the evaluation is accurate enough to make a decision on the preferred option. We don't think it would be viable and/or worthwhile to get more information to increase the accuracy of our evaluation as it's unlikely to change the relative differences between the options. Greater certainty over the rate of wetland loss emerge as a result of the capture and analysis of new aerial imagery.

In the longer term, remote detection technology is evolving so rapidly that in five to 10 years it is likely that the identification of wetlands will have progressed to enable the vast majority of wetlands to be mapped and measured.

Time-frame of the evaluation

The evaluation is made over the life-time of the plan (10-15 years).

The preferred management option

The preferred management option for the proposed Regional Plan is option A: which is a modified status quo approach.

Option A is preferred because it is likely to result in no further net loss in wetland area or degradation without significantly increasing the costs to land owners. This option:

- Encourages land owners employing good wetland management practices such as wetland restoration, enhancement and creation and weed control, through permitted and less restrictive activity status; and
- Acts as a deterrent for those undertaking activities that adversely affect wetlands, through elevating activity status and consequently costs.
- Strongly protects our significant wetlands.

Not surprisingly the most stringent option 'C' is most likely to halt loss in wetland area, reduced wetland condition, and minimise the risk of adverse effects from development, but the costs were considered prohibitive. Conversely, the permissive approach of option 'B' is unlikely to result in any meaningful change in wetland degradation and loss as it provides little deterrent and less ability for council to introduce measures to control adverse effects on wetlands. Option A occupies the middle ground between the more permissive and stringent options, but is likely to bring about similar results as the stringent option without many of the added costs to land owners.

7 Air

7.1 Legal background

Resource Management Act

Sections 5 -7

Air is specifically mentioned in Section 5 RMA as a resource that must be safeguarded.

Air is not a matter of national importance under Section 6 RMA.

Air falls under the ambit of parts of Section 7 RMA including:

(b) the efficient use and development of natural and physical resources;

(c) the maintenance and enhancement of amenity values;

(f) maintenance and enhancement of the quality of the environment.

Section 15

Under Section 1(1c) of the RMA, all industrial and trade discharges to air require a resource consent. However, the starting point for other discharges to air is that they are permitted unless otherwise stated by a national environmental standard (s15(2)) or rule in a plan (s15(2A).

Section 17

Includes a general duty on anyone to avoid, remedy or mitigate any adverse effect on the environment (this is not enforceable by itself). However, an enforcement order or abatement notice may be served to:

- *(a) require a person to cease, or prohibit a person from commencing, anything that, in the opinion of the Environment Court or an enforcement officer, is or is likely to be noxious, dangerous, offensive, or objectionable to such an extent that it has or is likely to have an adverse effect on the environment; or*
- *(b) require a person to do something that, in the opinion of the Environment Court or an enforcement officer, is necessary in order to avoid, remedy, or mitigate any actual or likely adverse effect on the environment caused by, or on behalf of, that person.*

Case law 'Objectionable and Offensive'

The words 'objectionable and offensive' feature quite widely in relation to the management of the cross boundary effects of air.

In *Zdrahal*, the test for what may be offensive or objectionable was discussed. It was *not* considered sufficient that:

- A neighbour or other person within the relevant environment considers the activity or matter to be offensive and objectionable; or
- That the tribunal itself might think the matter was objectionable.

The Planning Tribunal (at the time) considered that the person must not be hypersensitive but that their views must be "*...reflective of the opinions of a significant proportion of the public...*". The tribunal found that in order to decide on such a matter, it must transpose itself into the ordinary person representative of the community at large. This means that for an odour to be considered objectionable or offensive in the eyes of the court, information on the effects of the odour must be gathered which demonstrates that the test of the ordinary reasonable person can be met. This generally means that a history of complaint information, council officer investigations and evidence from affected parties is needed for such a case.

Section 30

Section 30 RMA gives regional councils a general ability to regulate the use of resources, namely:

- S30(a) the establishment, implementation, and review of objectives, policies, and methods to achieve integrated management of the natural and physical resources of the region; and
- S30(b) the preparation of objectives and policies in relation to any actual or potential effects of the use, development, or protection of land which are of regional significance.

Regional councils also have the main function of controlling discharges to air, in particular:

- S30(d) in relation to the discharge of contaminants into air within the coastal marine area.
- S30(f) in relation to the discharge of contaminants into air.
- S30(fa) (iv) in terms of allocating the use of air as a resource.

Section 31

Section 31 gives district councils the general ability to create objectives, policies, and methods to achieve integrated management of the effects of the use, development, or protection of land and associated natural and physical resources of the district. This function enables district councils to set rules that help avoid potentially incompatible activities from locating in close proximity. This can be a major cause of air nuisance complaints and therefore it is important to ensure that effective separation distances and zoning are used to avoid these complaints in the future.

Section 70A

Regional councils cannot have regard to climate change when developing rules to manage air discharges except in relation to where renewable energy enables a reduction into the air of greenhouse gases.

Section 138A

This section relates to special consideration of proposals for coastal dumping and incineration, which would otherwise contravene Section 15A (which does not allow dumping or incineration without a resource consent). This is a requirement following the adoption of the Resource Management (Marine Pollution) Regulations 1998.

Hazardous Substances and New Organisms Act 1996

Administered by the Environmental Protection Agency (EPA) for the introduction of new organisms and certification, recertification and use of hazardous substances and the Ministry of Business, Innovation and Employment (MBIE) for enforcing safe work practices. Through the provisions in the Act, the EPA can introduce controls and limitations on the use of chemicals and other hazardous agents in the environment. This can overlap with regional rules governing burning and the application of agrichemicals and spray coating where there can be controls on the rate and application of chemicals.

Civil Aviation Act 1990

Administered by the Civil Aviation Authority under Section 72B of the Civil Aviation Act 1990. The Act enables the authority to establish civil aviation safety and security standards, and monitor adherence to those standards. The authority can investigate incidents where the standards may be being breached as well as any aircraft accidents. This has relevance to aerial sprayers of agrichemicals who must comply with the Act and any standards set by the authority. Regional rules may also set conditions on pilots having an appropriate aerial applicators certificate from an approved body (for example, Growsafe) and these controls exist alongside civil aviation requirements.

Health Act 1956

Northland District Health Board and district councils both operate their public health functions under the Health Act 1956. The medical officer of health at the District Health Board can initiate investigations under the terms of the Act where an activity has the potential to be injurious to public health. They also have a particular role to investigate and contain outbreaks of notifiable diseases. District councils have a similar function to investigate incidents of activities that may be injurious to public health. Dust and spray can all cause or aggravate health problems and therefore there are overlaps between a regional council's role to control the discharges into air of these contaminants and district health boards and district councils' roles to investigate activities with adverse health effects. District councils also have functions under this Act which allow them to control fire and smoke nuisance. Neither Far North District Council nor Whangarei District Council use this function. Kaipara District Council advise that they respond to an average of 30 complaints a year on fire nuisance under these functions.

Health and Safety at Work Act 2015

Requires the identification and management of risk at work places. This law is mainly concerned about work place practices rather than environmental effects caused by the activity, nevertheless one can clearly have an effect on the other and there are overlaps between the management of workplace risk and the management of environmental effects. For example, the storage of hazardous substances to prevent their release into the environment (into water, onto the land or into the air).

Local Government Act 2002

Under the Local Government Act, councils can develop bylaws to govern matters within their functions. Council fire prevention bylaws exist in Whangārei, Far North and Kaipara districts. The bylaws set standards to be met and these standards can relate to weather conditions, setbacks from combustible materials, the number of people present at a fire site, control of fires, and limits on time of day etc. The bylaws are designed to prevent the spread of fire rather than smoke nuisance, although there is a practical overlap.

Resource Management (National Environmental Standards for Air Quality) Regulations 2004

The National Environmental Standards – Air Quality is a set of regulations produced under the RMA. National Environmental Standards can prescribe technical standards, methods or other requirements for environmental matters. Each regional, city or district council must enforce the same standard. In some circumstances, councils can impose stricter standards (as is the case for the air standards).

The National Environmental Standards – Air Quality are made up of 14 separate but interlinked standards. The 14 standards include:

- Seven standards banning activities that discharge significant quantities of dioxins and other toxins into the air;
- Five standards for ambient (outdoor) air quality;
- A design standard for new wood burners installed in urban areas; and
- A requirement for landfills over one million tonnes of refuse to collect greenhouse gas emissions.

The national standards were amended in June 2011 with the main changes being:

- Extending the target date for regional councils to meet the ambient particulate matter (PM_{10}) standard. New split target dates are 1 September 2016 (airsheds with between one and 10 exceedances of the ambient PM_{10} standard) and 1 September 2020 (airsheds with 10 or more exceedances of the ambient PM_{10} standard). Airsheds are defined areas where air quality has the potential to exceed national standards. Northland has five defined airsheds in Kaitāia, Whangārei, Dargaville, Kerikeri and Marsden Point;
- Making provision for the exclusion of exceptional events (for example, dust storms, volcanic eruptions);
- Requiring 'offsets' from certain new industries with PM_{10} discharges in 'polluted' airsheds from September 2012, replacing the current restrictions on industrial consents; and
- Prohibiting new solid fuel-burning open fires in homes in polluted airsheds from September 2012.

As Northland does not have any airsheds considered polluted (for example, more than one exceedance per year for PM_{10}), most of the changes to the national standards do not apply.

The national standards prescribe a prohibition of all of the following types of burning (this applies universally as a regional rule cannot be more permissive than this standard):

- Landfill fires (Regulation 6);
- Burning of tyres in the open (Regulation 7);
- Bitumen burning (Regulation 8);
- Burning of coated wire in the open (Regulation 9);
- Burning of oil in the open (Regulation 10);
- School and healthcare incinerators unless a resource consent is obtained (Regulation11); and
- High temperature incinerators (Regulation 12).

7.2 Planning documents

Regional Policy Statement

The Regional Policy Statement has no specific air quality provisions. There is direction to district councils to avoid incompatible land uses from being sited in close proximity (such as odourous activities near a residential area).

Auckland Unitary Plan

The Auckland Unitary Plan aligns zone amenity with consent activity status for air discharges. For example, a lesser consent activity status is applied to certain air discharges in a rural zone, taking into account amenity expectations (which would be expected to be higher in a residential zone) and the suitability of the rural zone for those activities and the effects that go with them (for example, intensive farming). A fully integrated approach such as this can be adopted because of the unitary nature of the plan.

Regional Air Quality Plan

This is the current plan for managing the air resource under the Resource Management Act 1991. For practical purposes, the current Regional Air Quality Plan limits regulation of air discharges with only a minor adverse effect. It does this in two ways, depending on whether the air discharge is from an industrial or trade premise or any other place or source. Under Section 15(1c) of the RMA, all industrial and trade discharges to air require a resource consent unless permitted by a rule in a plan. Therefore, the Regional Air Quality Plan specifies those industrial and trade activities where consent is not required.

Section 15(2A) of the RMA on the other hand states that only through a rule in a plan can air emissions from any other place or source be regulated. Therefore, many activities are simply not listed in the Regional Air Quality Plan, thus requiring no consent, as their effects have been considered to be only minor. Nevertheless, there are a modest number of consents in the region for an air discharge, 359 on land (as of December 2013) and 14 in the coastal marine area (regulated separately through the Regional Coastal Plan) making a total of 373 in total. Overall however the plan generates a relatively small number of consents compared with those held under rules for other plans. The Regional Coastal Plan for example has 4519 currently held coastal permits. The policy approach (in general) is to permit an activity that has a high ability to internalise effects within the boundaries of the site.

Iwi and hapū management plans

Five iwi and hapū management plans in Northland refer to air. In general the issue is about maintaining the mauri (life force) of air, free from contaminants emitted from man-made sources. Of particular concern are contaminants that adversely affect sites of wāhi tapu (sacred) and discharges that contain human remains (such as crematoria). The plans advocate a rules-based approach to reduce the effects of these activities.

7.3 Odour

7.3.1 Executive summary

This section evaluates the options for managing odour in the new Regional Plan. The most relevant Regional Plan provisions are:

- Rules - C 7.2.3, C 7.2.4, C 7.2.6, C 7.2.7
- Policies - D 3.1, D 3.3

Odour is the human perception of one or more chemical compounds in the air we breathe. Adverse effects occur when odours are perceived to be of such a character, intensity or duration that causes annoyance, offense or ill health. The number of complaints in Northland on odour has trended downwards between 2007-2014. This is in spite of population growth and the growth and intensification of subdivision around the edge of towns and cities bringing people close to rural areas where 'smells' relating to farming can occur. This could suggest people are becoming more tolerant of smells or, more likely, better technology and techniques are being used to mitigate adverse effects (for instance better bio- filters to reduce odour from wastewater treatment).

Overall it is considered that our existing rules are working well and there is little need to make significant changes (Regional Air Plan Review, 2014). It is noted however, that there are difficulties with the enforcement of odour complaints where it is intermittent – i.e the odour can come and go, often depending on which way the wind blows. This is particularly true of primary production where there are many incidental 'smells' – for example, the spreading of animal effluent – the effect of which can last a short time (and be extremely odourous) and then dissipate.

The preferred management option is therefore 'Option B – status quo with a catch-all rule. This option gives more flexibility in dealing with unexpected discharges from non-industrial and trade sources (most industrial and trade sources would need a consent under Section 15 RMA) than the status quo. Most complaints of a non-industrial nature tend to be short duration, high intensity and/or high impact on neighbours. Under the status quo, complaints are addressed under Section 17 RMA, where Council must give 7 days to comply with any notice of abatement. The use of Section 15 RMA removes this requirement allowing a faster enforcement response and/or the ability for a consent to be applied for.

Option B is outlined in the table below:

Agriculture	Industrial and trade	Wastewater/landfill	Miscellaneous
Permitted rule – subject to no nuisance effects beyond the boundary enforced using S15 RMA.	Consent required except specified activities, where condition is no nuisance effects across boundary.	Consent required.	Permitted – subject to no nuisance effects beyond the boundary.

Other options considered but discarded include:

Option A - the Status Quo - is discarded because it does not reduce the number of incidents (and people being affected).

Option C - requiring that neighbours are notified before certain 'smelly' activities takes place - is a viable option however it is slightly eclipsed by Option B as the 'hassle' factor is somewhat greater.

Option D - requiring mandatory buffer zones - is considered excessive due to the opportunity cost it will impose, although it will likely reduce complaints. This assumes that there is compliance with the rule as complaints may actually rise if odourous activities take place too close to the boundary in breach of any required setback.

Option E - requiring a resource consent before certain 'smelly' activities takes place - is discarded because it will impose high costs on those carrying out odorous activities and significantly reduce the flexibility available of when to undertake them.

7.3.2 Relevant provisions

This evaluation supports the following Regional Plan provisions:

Rule C 7.2.3 - Discharges to air from a closed landfill – permitted activity

Rule C 7.2.4 - Discharges to air from industrial and trade activities – permitted activity

Rule C 7.2.6 - Discharges to air not specifically regulated in the plan – permitted activity

Rule C 7.2.7 - Discharge into air not permitted, controlled, restricted discretionary, non-complying or prohibited – discretionary activity

Policy D 3.1 - General approach to managing air quality and

Policy D 3.3 - Dust and odour generating activities

7.3.3 The problem, opportunity and/or requirement

Odour is the human perception of one or more chemical compounds in the air we breathe. Adverse effects occur when odours are perceived to be of such a character, intensity or duration that causes annoyance, offense or ill health. Perception of odour varies from person to person and is hard to model/measure and therefore quantify, especially before a new potentially odour emitting activity is established. As such, established legal precedence is to use the FIDOL factors of assessment (Frequency, Intensity, Duration, Offensiveness and Location). For more information refer to the www.mfe.govt.nz/publications/air/good-practice-guide-assessing-and-managing-odour-new-zealand published by the Ministry for the Environment.

Because it is difficult to attach a numerical standard to odour effects, resource consent and permitted activity conditions (where there is the potential for adverse effects for odour), have stipulated that there shall be no objectionable or offensive effects across the property boundary. The condition of no objectionable or offensive effects is simple to understand but can be more subjective even using FIDOL (as opposed to a numerical standard) and is a reactive condition as the activity is often established before the effect can be determined. This raises the importance of good district plan provisions requiring setbacks/buffers from sensitive areas.

Many benign air discharges from manufacturing and industrial activities are permitted through Appendix 5 of the current Regional Air Quality Plan (subject to the general condition 'no objectionable or offensive effects across the boundary'). However, activities that we know can have significant odour issues, which includes most wastewater treatment plants, pump stations and solid waste processes (there is a $3m^3$ per day to land threshold) and all operating landfills, require resource consent. This approach has generally been working well although there is always the risk that a benign industrial and trade activity not listed in Appendix 5 will require a resource consent for an air discharge.

On balance, this approach is preferred to the alternative of permitting every industrial and trade discharge except those listed in the plan. This is because, if an industrial and trade activity that gives rise to offensive, objectionable or even harmful air discharge effects is not listed, the discharge is essentially permitted and dealing with adverse effects once an activity has started is harder.

All closed landfills that postdate the notification date (1995) of the Regional Air Quality Plan currently require a resource consent. Although these number only a few resource consents, the rule itself presents a problem. Landfill gas diminishes over time (20-30 years) from closure, it is unnecessary to continue to require consents to be sought once the current consent lapses, if the problem has resolved.

Transfer stations do not require consent (subject to the condition of 'no objectionable or offensive effects across the boundary') however this may be hard to meet on occasions where they are situated next to sensitive areas. In these cases a consent is often sought.

A large number of activities that can give rise to significant odour do not require a consent. This includes rural 'smells' from normal farming activities such as dairy shed effluent, effluent spreading and silage pits and intensive farming activities such as piggeries and poultry farms. The only consent threshold is placed on piggeries (of 25 pigs or greater). It is uncertain why this figure is used and only one consent is held in the region for discharges to air from a piggery, questioning the utility of this rule.

Adverse effects related to odour are typically recorded when a complaint arises, usually from a member of the public or nearby resident/land owner. The number of complaints in Northland has trended downwards between 2007-2014, as can be seen from the table below. This is in spite of population growth and the growth and intensification of subdivision around the edge of towns and cities bringing people close to rural areas where 'smells' relating to farming can occur.

-	2007	2008	2009	2010	2011	2012	2013	2014
Number of odour complaints received	98	72	59	67	60	60	49	42

This could suggest people are becoming more tolerant of smells or, more likely, better technology and techniques are being used to mitigate adverse effects. This can be required by conditions of consent where consent is required under current plan rules. For example, a number of upgrades to wastewater treatment plants have been required to achieve better 'out of pipe' water quality which has also had a secondary impact of reducing odour. Complaints of odour are often secondary to complaints about other air effects, for example, smoke and spray. Complaints are typically about intermittent effects (as people can learn to live with continual odour effects or are aware of them before moving to an area) and they typically come from permitted activities such as farming animals, fertiliser application or storing silage. Continual odour tends to come from consented activities such as wastewater treatment plants or from intensive farming activities. District councils have rules requiring setbacks between sensitive activities and intensive farming activities and wastewater treatment plants to limit complaints.

Overall it is considered that our existing rules are working well and there is little need to make significant changes (Regional Air Plan Review, 2014). It is noted however that there are difficulties with the enforcement of odour complaints where it is intermittent – it can come and go, often depending on which way the wind blows. This is particularly true of primary production where there are many incidental 'smells' – for example, the spreading of animal effluent – the effect of which can last a short time (and be extremely odourous) and then dissipate.

Where the plan is silent and the activity is from 'any other place or source', under s15 of the RMA, the activity automatically is permitted. Where the plan is silent, enforcement must be undertaken using s17 RMA which allows a minimum seven days for compliance in circumstances where there is no rule (s322(1)(a)(ii) and S324(d)). As explained above however, odour may only last a short time (less than seven days) making enforcement impotent. A catch-all rule to permit all odour discharges, subject to no offensive effects across the boundary, would allow enforcement to take place without recourse to s17, enabling a more nimble response (requiring compliance in less than seven days).

Feedback received on draft regional plan - September 2016.

Several submitters discussed odour related issues and one suggested that setbacks from sensitive receptors and vice-versa be considered. Generally this area though did not attract much discussion. It is also noted that the Regional Policy Statement for Northland 2016 requires that district councils avoid reverse sensitivity effects (RPS Policy 5.1.1) and this is now being given effect to through relevant plan changes.

7.3.4 Management options

This section summarises the management options for odour. The intention is not to identify every different combination of approach, as there would be many, but to represent the range of options and highlight key differences in approaches.

The key differences between the options focus on:

1) Remaining silent (default to a permitted activity) for most activities that give rise to intermittent odour (for example, farming) but require resource consent for activities with continual odour effects (typically industrial and trade premises - for example, wastewater treatment plants);
2) Improving enforcement options with a catch-all permitted rule;
3) Notification standards for permitted activities;
4) Mandatory setbacks for permitted activities; and
5) Expanding the scope of where a resource consent is required.

Option A: status quo

Overview: retain status quo approach where most activities that give rise to intermittent odour (for example, farming) are effectively permitted (the plan remains silent) but require resource consent for activities with continual odour effects (for example, wastewater treatment plants). Enforcement of permitted activities uses S17 RMA.

Background: this option is the status quo and is based on the existing Regional Air Quality Plan.

Agriculture	Industrial and trade	Wastewater/landfill	Miscellaneous
No rule (default permitted). No nuisance effects across boundary enforced using S17 RMA.	Consent required except specified activities, where condition is no nuisance effects across boundary.	Consent required.	No rule – default permitted.

Option B: status quo with catch-all rule

Overview: as above except having a catch-all permitted rule for any activity not covered by any other rule. Enforcement of permitted activities uses S15 RMA.

Background: this option is the status quo and is based on the existing Regional Air Quality Plan with the exception of the proposed additional permitted rule.

Agriculture	Industrial and trade	Wastewater/landfill	Miscellaneous
Permitted rule – subject to no nuisance effects beyond the boundary enforced using S15 RMA.	Consent required except specified activities, where condition is no nuisance effects across boundary.	Consent required.	Permitted – subject to no nuisance effects beyond the boundary.

Option C: notifying neighbours of 'smelly' activities

Overview: essentially the same approach as B but also requiring that neighbours are notified before 'smelly' activities are undertaken.

Background: setbacks are not used in the current Regional Air Quality Plan.

Agriculture	Industrial and trade	Wastewater/landfill	Miscellaneous
Permitted – subject to no nuisance effects beyond the boundary. Notification required.	Consent required except specified activities, where condition is no nuisance effects across boundary.	Consent required.	Permitted – subject to no nuisance effects beyond the boundary. Notification required.

Option D: buffer zones

Overview: requires that any discharge take place within a certain distance back from a sensitive area.

Background: this approach is proposed to be used for burning and is currently used for spray activities.

Agriculture	Industrial and trade	Wastewater/landfill	Miscellaneous
Permitted – subject to no nuisance effects beyond the boundary. Buffer zone.	Consent required except specified activities, where condition is no nuisance effects across boundary.	Consent required.	Permitted – subject to no nuisance effects beyond the boundary. Buffer zone.

Option E: resource consent required

Overview: requires that any discharge giving rise to odour requires a consent.

Background: this would expand the scope of resource consent requirements to a lot of permitted activities. The activity status would shift from a permitted to a controlled activity.

Agriculture	Industrial and trade	Wastewater/landfill	Miscellaneous
Consent required (probably controlled activity).	Consent required.	Consent required.	Consent required (probably controlled activity).

7.3.5 High level objectives and measures

Section 32 requires an assessment of *"...the efficiency and effectiveness of the provisions in achieving the objectives..."*. Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section 1.6 'Evaluation approach' for more details.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. They also signal a direction for where we want to head, without stating how far we go – that comes later (they are the beginnings of objectives).

Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against.

High level objective	Measure
Minimise the adverse effects of odour on people. *and* Minimise cost to council in dealing with complaints on odour.	1 = significantly more incidents. 2 = moderately more incidents. 3 = slightly more incidents. 4 = same number of incidents. 5 = slightly fewer incidents. 6 = moderately fewer incidents.

High level objective	Measure
	7 = significantly fewer incidents. 8 = no incidents.
Minimise costs and bureaucracy to those carrying out the activity.	1 = significantly more cost/hassle. 2 = moderately more than currently cost/hassle. 3 = slightly more than currently cost/hassle. 4 = same as currently. 5 = slightly less than currently cost/hassle. 6 = moderately less cost/hassle. 7 = significantly less cost/hassle. 8 = no cost/hassle – no restrictions on what people can do.

Explanation for the high level objectives and measures

Section 32 requires an assessment of the impacts on economic growth and employment opportunities (s32(2)(A)). However, the impact of the options on these is imperceivable and/or can't be determined with any confidence. Therefore, economic growth and employment opportunities have not been included as high level objectives. For more information go to the section '1.7 'Assessing impacts on economic growth and employment opportunities'' (which is in the Introduction section)

Minimise impact of odour on people. Minimise cost to council in dealing with complaints on dust.

These two objectives are linked because often when people experience strong odour, they complain to Council. Therefore a reduction in complaints equates to a reduction in Council cost and time to respond to odour related incidents.

The high level objective and measure is effectively a measure of the likelihood of adverse effects occurring. Requiring a resource consent for every odorous activity would be a proactive approach to managing effects. Applicants would have to demonstrate that no offensive or objectionable effects will occur across the boundary. This approach is likely to score highly on this scale (a 6 or 7) as a resource consent could include strict conditions to limit odour. Buffer zones would also reduce complaints (assuming the buffer setbacks were complied with) as odour would have further to travel. On the other hand, at the other end of the scale, no restrictions at all would mean only a reactive approach by council using the functions of s17 RMA to serve an abatement notice on any odour nuisance. This approach is likely to score much lower (a 1 or 2) precisely because it is reactive.

The council's cost comes from responding to complaints about odour. It is expected that with fewer incidents reported as a result of tighter control, there will be a reduction in staff time spent responding to them. Having no restrictions means council has to spend time and resources 'proving there is an effect'. Requiring a resource consent on the other hand is a relatively minimal cost as this can be recovered from the applicant. It will also put the onus on the applicant to 'prove' that effects are not significant.

Minimise costs and bureaucracy to those carrying out the activity.

Minimising offensive odour can cost money and can be a hassle for those carrying out the activity. At the top end of the scale, requiring a resource consent will be a hassle for activities where there are currently no consent requirements. A large number of consents would likely be generated as even activities giving rise to intermittent odour (such as normal farming activities) would need a consent.

The costs of a consent are:

- $3144 – limited notified/notified discharge consent.
- $838 – non notified discharge consent.

In nearly all cases the consent will likely be non-notified (if a renewal of an existing consent then the charge is $734).

Aside from any consent requirements, more restrictive rules could increase opportunity costs. Opportunity costs are the costs that are lost when pursuing the most favoured option over the next most favoured option. For example, an option requiring a setback may mean a loss of productivity on the margin of land where fertiliser can't be applied. To take another example, notification could reduce the amount of flexibility a farmer has in applying fertiliser – he/she has to wait until neighbours are notified. An option requiring a consent may also mean a delay in being able to undertake the application and cost that could otherwise be spent on more productive activities.

7.3.6 Evaluating the management options

Management options for odour

High level objective and measure	Option A – status quo	Option B – status quo with catch-all rule	Option C – more notification for odourous activities	Option D – mandatory setbacks for odourous activities	Option E – resource consent for odourous activities
Minimise the adverse effects of odour on people. Minimise cost to council in dealing with complaints on odour. *Measure: Number of environmental incidents received by Council.*	4 = same number of incidents.	5 = slightly fewer incidents.	5 = slightly fewer incidents.	6 = moderately fewer incidents.	6 = moderately fewer incidents.
Minimise costs and bureaucracy to those carrying out the activity. *Measure: Cost/hassle to those carrying out the activity.*	4 = same as currently.	3.5 = slightly more cost/hassle.	3 = slightly more cost/hassle.	2 = moderately more cost/hassle.	1 = significantly more cost/hassle.

Certainty about the evaluation

There is always uncertainty about the potential impacts of management options. We're moderately confident about the accuracy of the evaluation for these five options.

Time-frame of the evaluation

The evaluation is made over the life-time of the plan (10-15 years).

The preferred management option

The preferred management option is 'Option B – status quo with a catch-all rule. This option gives more flexibility in dealing with unexpected discharges from non-industrial and trade sources (most industrial and trade sources would need a consent under Section 15 RMA) than the status quo. Most complaints of a non-industrial nature tend to be short duration, high intensity and/or high impact on neighbours. Under the status quo, complaints are addressed under Section 17 RMA, where Council must give 7 days to comply with any notice of abatement. The use of Section 15 RMA removes this requirement allowing a faster enforcement response and/or the ability for a consent to be applied for.

Option A is discarded because it does not reduce the number of incidents (and people being affected).

Option C is a viable option however it is slightly eclipsed by Option B as the 'hassle' factor is somewhat greater.

Option D is considered excessive due to the opportunity cost it will impose, although it will likely reduce complaints. This assumes that there is compliance with the rule as complaints may actually rise if odourous activities take place too close to the boundary in breach of any required setback.

Option E is discarded because it will impose high costs on those carrying out odorous activities and significantly reduce the flexibility available of when to undertake them.

7.4 Spray

7.4.1 Executive summary

This section evaluates the options for managing spray in the new Regional Plan. The relevant Regional Plan provisions are:

- Rules - C.6.5.1, C.6.5.2, C.6.5.5
- Policies - D.3.1, D.3.4

Agrichemical use is widespread in Northland in the horticultural, agricultural and forestry sectors. Agrichemicals are also used by local government in public parks and reserves, and in domestic gardens.

Spraying can take place in the air, onto land and into water. Currently all three resource plans (the regional air, water and soil and coastal plans) contain rules on agrichemicals to address this division.

There are three methods of spraying agrichemicals – hand-held, ground-based motorised, and aerial. Hand-held is generally understood as backpack spraying but could include a motorised pump on a vehicle – so long as the application device is held by hand. An example of 'ground-based' spraying might be spraying from a boom on a tractor or otherwise where the application device is not held by hand. Aerial spraying is spraying from a helicopter, drone or plane. All agrichemicals have to be approved for use by the Environmental Protection Authority.

The main concern with agrichemical spraying is off-target effects – when spray drift reaches sensitive environments other than the intended target. Sensitive environments might include residences, water bodies, organic farming properties, schools and nursing homes. People consistently tell us (through feedback and lodging complaints) that they wish to be notified before spraying takes place. This is to give them time to disconnect pipes taking drinking water from the roof, shut windows, avoid hanging out washing and protect sensitive crops (such as covering plants). The main issue is that currently, rules do not adequately make the distinction between aerial and ground-based spraying with the same notification distance of 30 metres being required for both. This means that people do not feel they are adequately protected as the rules on notification are based on the effects of ground-based spraying (with less potential for drift), not aerial spraying.

The preferred management option for the new Regional Plan is Option C – more notification for aerial spraying. Although it will only likely lead to slightly fewer incidents, it strikes the greatest balance to informing people that spraying is taking place while maintaining a degree of flexibility for those doing the spraying. This is important because in many incidents involving spray, notification is the single biggest issue and having an adequate notification distance for aerial spraying will go someway to reassuring neighbouring property owners. Notification can allow people to cover crops, move beehives, cover sources of drinking water, close windows and take washing off the line. There is likely to be some addition hassle for sprayers with complying with this rule though notification can be carried out relatively easily (text message or email). It is also proposed to change the timing of notification – from 18 hrs to 24 hrs - which gives less flexibility for the sprayer but slightly more notice to the neighbouring property. The Option retains the requirement to avoid cross boundary effects.

Option C is outlined in the below table.

Hand-held	Ground-based	Aerial	Aquatic
Permitted	Permitted Notification 30m	Permitted Increased notification to 200m	Permitted Notification 1km downstream

Other options considered but discarded were:

Option A - the Status Quo - is discarded because, with it, the problem of insufficient notification distances for aerial spraying remains.

Option B - a minimalist approach that leaves notification to the discretion of the landowner or applicator - is discarded because notification is consistently rated as important for people and (in all likelihood with this option) not being notified would increase the number of incidents and community concern.

Option D -requiring mandatory setbacks - is considered excessive due to the opportunity cost it will impose although it will likely reduce complaints. This assumes that there is compliance with the rule as complaints may actually rise if spraying takes place too close to the boundary in breach of any required setback.

Option E - requiring a resource consent for aerial spraying - is discarded because it will impose high costs on sprayers and significantly reduce flexibility of when to spray.

7.4.2 Relevant provisions

This evaluation supports the following Regional Plan provisions:

- Rule C.6.5.1 - Application of agrichemicals – permitted activity
- Rule C.6.5.2 - Application of agrichemicals into water – permitted activity
- Rule C.6.5.5 - Application of agrichemicals and vertebrate control chemicals – discretionary activity
- Policy D.3.1 - General approach to managing air quality
- Policy D.3.4 - Spray generating activities

7.4.3 The problem, opportunity and/or requirement

Spraying includes agrichemicals and the application of coating materials (for example, paint and solvents).

Agrichemical use is widespread in Northland in the horticultural, agricultural and forestry sectors. Agrichemicals are also used by local government in public parks and reserves, and in domestic gardens.

Spraying can take place in the air, onto land and into water. Currently all three resource plans (the regional air, water and soil and coastal plans) contain rules on agrichemicals to address this division.

There are three methods of spraying agrichemicals – hand-held, ground-based motorised, and aerial. Hand-held is generally understood as backpack spraying but could include a motorised pump on a vehicle – so long as the application device is held by hand. An example of 'ground-based' spraying might be spraying from a boom on a tractor or otherwise where the application device is not held by hand. Aerial spraying is spraying from a helicopter or plane. All agrichemicals have to be approved for use by the Environmental Protection Authority.

The main concern with agrichemical spraying is off-target effects – when spray drift reaches sensitive environments other than the intended target. Sensitive environments might include residences, water bodies, organic farming properties, schools and nursing homes. There is particular community concern around aerial spraying. Aerial spraying is subject to greater risk of spray drift than ground-based spraying, even with the significant improvements in technology developed to control drift, which includes low drift nozzles, high carrier volumes, larger droplets, lower pressures and technology that allows computerised (via GPS) application.

People consistently tell us (through feedback and lodging complaints) that they wish to be notified before any spraying is to take place. This is to give them time to take measures to protect drinking water and sensitive activities (such as covering plants). Overspray can be an issue as well although, as stated above, technology has improved considerably to reduce this risk. The main issue is that currently, rules do not adequately make the distinction between aerial and ground-based spraying with the same notification rules (30 metres) for both. This means that people do not feel they are adequately protected as the rules on notification are based on the effects of ground-based spraying. Notification is an issue for sprayers. The current rules in the Regional Air Quality Plan state that a minimum of 18hrs notice is give before spraying commences. Feedback from attendees at the regional plan review workshop however was that the current 18 hour minimum notification time was too onerous. On the other hand, it could be argued that it is important for neighbours to feel they have been adequately notified (at least) the day before.

The council receives around 30-40 complaints each year on spray drift (typically agrichemical spraying). Many of the complaints relate to spraying taking place too near the boundary and a lack of notification, and most of these complaints relate to aerial agrichemical spraying. Dealing with these complaints is not cost recoverable (generally) as the activity is permitted. A typical complaint takes 3-4 hours of staff time to deal with if the complaint is straightforward but longer if enforcement action is required.

In addition to agrichemical spraying, other types of spraying include spray coating (for example, boats or cars). This is currently permitted in the Regional Air Quality Plan, providing the activity does not exceed 30 litres per day. There is no obvious reason for this threshold and only a few consents are held for this activity (it has triggered the need for consent from several of the larger boat refitters in Whangarei). The main issues with paint spraying are; 1. proximity to sensitive areas, such as water bodies; and 2. the volume of paint being sprayed at a given time (rather than the total volume over the course of a day). It is also worth noting that the EPA has introduced new rules that more strictly regulate the spraying of antifoul paint on vessels that will have an effect on how this activity is regulated.

The only issue raised in the report '*Review of the Regional Plan – Tangata Whenua Issues and Options'* was the possible effects of spray on honey bees. These are not currently considered sensitive areas for the purposes of notification of spraying however could be considered to be a sensitive area in the new regional plan.

Feedback received on draft regional plan - September 2016

Feedback on agrichemical spraying can be roughly broken down into the following:

- Qualification requirements - the need for Growsafe contractor qualifications for low risk applications or the need for Growsafe at all when a HSNO approved handler qualification is held.
- Notification - changes suggested to the notification distance or to the timing of notification being more permissive or restrictive.
- Definitions - some changes to the definitions of what constituted a 'spray sensitive area' were suggested.
- There was general concern from some on the toxicity of agrichemical spraying and proximity to boundaries.

The feedback has been considered in the assessment below.

7.4.4 Management options

Spray management options

This section summarises the management options for agrichemical spraying. The intention is not to identify every different combination of approach, as there would be many, but to represent the range of options and highlight key differences in approaches.

The key differences between the options focus on the level of control council exercises on agrichemical spraying.

Assumptions to be factored in across all options are:

- Sprayers to be properly certified (for example by Growsafe). Growsafe is a branded product but it provides a useful indication as to the standard required. It is not intended to require Growsafe for handheld spraying;
- Agrichemicals approved for use by Environmental Protection Authority (EPA); and
- No direct spraying into water bodies (unless approved by EPA for that purpose) or onto sensitive areas.

The spraying of coating materials has not been assessed as no significant changes are proposed with the exception of the removal of the 30 litre a day limit. However resource consent will still be required for any discharge of hazardous substances to water or onto land in circumstances where it may enter water and EPA rules will apply to the application of anti-foul paint.

Option A: status quo

Overview: this option essentially roles over the existing approach in the Regional Air Quality Plan:

- Retain 30m distance from boundary to notify neighbours for ground based and aerial spraying.

- 18 hours to 2 weeks' notification to be given before spraying takes place.
- Spraying in water – notice given to water users and consent holders 1km downstream before spraying commences.

Background: as above – these are the existing rules.

Hand-held	Ground-based	Aerial	Aquatic
Permitted	Permitted Notification 30m	Permitted Notification 30m	Permitted Notification 1km downstream

Option B: minimalist approach

Overview: this permits spraying without any explicit notification requirements leaving it up to the applicator or owner of the land being sprayed whether to notify neighbours.

Background: this approach is not followed in other regions – notification is generally seen as desirable and forms part of best practice (NZS 8409 (2004): Management of agrichemicals).

Hand-held	Ground-based	Aerial	Aquatic
Permitted	Permitted	Permitted	Permitted

Option C: more notification for aerial spraying

Overview: this approach requires more notification for aerial spraying where taking place up to 200m from a sensitive area on a neighbouring property and a change from 18hrs to 24hrs notice.

Background: this approach is used in some other regions plans (some distances are greater still – for example, Bay of Plenty uses 300m for aerial spraying).

Hand-held	Ground-based	Aerial	Aquatic
Permitted	Permitted Notification 30m	Permitted Increased notification to 200m	Permitted Notification 1km downstream

Option D: mandatory setbacks for aerial spraying

Overview: this approach requires that there are mandatory setbacks from sensitive areas for spraying activities – a 30m setback for ground-based spraying and 200m for aerial spraying.

Background: this approach is not used in any other region.

Hand-held	Ground-based	Aerial	Aquatic
Permitted	Permitted Setback of 30m	Permitted Increased notification to 200m	Permitted Notification 1 km downstream

Option E: Resource consent for aerial spraying

Overview: this approach requires a resource consent be sought for aerial spraying. Conditions would be placed on notification, setbacks from boundaries, methods of spraying and when spraying can take place.

Background: this approach is not used in any other region. It is a 'maximum' regulatory approach.

Hand-held	Ground-based	Aerial	Aquatic
Permitted	Permitted Notification 30m	Controlled or restricted discretionary activity	Permitted Notification 1km downstream

7.4.5 High level objectives and measures

Section 32 requires an assessment of "*...the efficiency and effectiveness of the provisions in achieving the objectives...*". Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section 1.6 'Evaluation approach' for more details.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. They also signal a direction for where we want to head, without stating how far we go – that comes later (they are the beginnings of objectives).

Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against.

High level objective	Measure
Minimise community concern on exposure to agrichemical spraydrift.	1 = significantly more incidents. 2 = moderately more incidents. 3 = slightly more incidents. 4 = same number of incidents. 5 = slightly fewer incidents. 6 = moderately fewer incidents. 7 = significantly fewer incidents. 8 = no incidents.
Minimise costs and bureaucracy to those carrying out the activity.	1 = significantly more cost/hassle. 2 = moderately more than currently cost/hassle. 3 = slightly more than currently cost/hassle. 4 = same as currently. 5 = slightly less than currently cost/hassle. 6 = moderate less cost/hassle.

High level objective	Measure
	7 = significantly less cost/hassle. 8 = no cost/hassle – no restrictions on what people can do.

Explanation for the high level objectives and measures

Section 32 requires an assessment of the impacts on economic growth and employment opportunities (s32(2)(A)). However, the impact of the options on these is imperceivable and/or can't be determined with any confidence. Therefore, economic growth and employment opportunities have not been included as high level objectives. For more information go to the section 1.7 'Assessing impacts on economic growth and employment opportunities' (which is in the Introduction section).

Minimise community concern on exposure to agrichemical spraydrift.

Agrichemical spraydrift can have a significant effect on certain sensitive areas. Sensitive areas in relation to spray include homes, businesses, schools, hospitals as well as certified organic farms and waterbodies. Spraydrift from herbicide application can sometimes be obvious due to evidence of plant or crop die-off. It can be more difficult to find evidence of insecticide or fungicide spraydrift due to the absence of physical evidence although, anecdotally, there may be some adverse effects on bee species. Even in the absence of proven adverse environmental effects people feel concerned when they witness spraying take place nearby. When people feel concerned they often call the regional council environmental hotline to complain - often providing anecdotal evidence that overspray has taken place. It is therefore appropriate that we consider the level of community concern each option is likely to lead to. The measure of environmental incidents raised is a good indication of this concern.

Minimise costs and bureaucracy to those carrying out the activity.

Compliance costs include the cost of having to get a consent and then any ongoing monitoring fee associated with the consent. Having to get a consent and then pay an annual monitoring fee is a cost, albeit a minor one, when compared with the other costs of running a business. Nevertheless, it is still beneficial to consider how changes to rules will impact on the costs of complying with regulation for business. The costs of a consent are:

- $3144 – limited notified/notified discharge consent.
- $838 – non-notified discharge consent.

Additional monitoring costs of $95 per hour can apply.

In nearly all cases the consent will be non-notified. What's more, if the resource consent is a renewal of an existing consent then the charge is $734.

Aside from any consent requirements, more restrictive rules could increase opportunity costs. Opportunity costs are the costs that are lost when pursuing the most favoured option over the next most favoured option. An option requiring setback may mean a loss of productivity on the margin of land that can't be sprayed. Notification can also reduce the amount of flexibility a sprayer has to spray. An option requiring a consent may mean delay in being able to undertake the spraying and cost that could otherwise be spent on more productive activities.

7.4.6 Evaluating the management options

Management options for agrichemical spraying.

High level objective and measure	Option A – status quo	Option B – minimalist approach	Option C – more notification for aerial spraying	Option D – mandatory setbacks for aerial spraying	Option E – resource consent for aerial spraying
Minimise the adverse effects (including health effects) of spraying on people and the environment. *Measure: Number of environmental incidents received by Council.*	4 = same number of incidents.	3 = slightly more incidents.	5 = slightly fewer incidents.	6 = moderately fewer incidents.	6 = significantly fewer incidents.
Minimise costs and bureaucracy to those carrying out the activity. *Measure: Cost/hassle to those carrying out the activity.*	4 = same as currently.	5 = slightly less cost/hassle.	3 = slightly more cost/hassle.	2 = moderately more cost/hassle.	1 = significantly more cost/hassle.

Certainty about the evaluation

There is always uncertainty about the potential impacts of management options. We're moderately confident about the accuracy of the evaluation for these five options.

Time-frame of the evaluation

The evaluation is made over the life-time of the plan (10-15 years).

The preferred management option

The preferred management option for the new Regional Plan is Option C – more notification for aerial spraying. Although it will only likely lead to slightly fewer incidents, it also strikes the greatest balance to informing people that spraying is taking place while maintaining a degree of flexibility for those doing the spraying. This is important because in many incidents involving spray, notification is the single biggest issue and having an adequate notification distance for aerial spraying will go someway to reassuring neighbouring property owners. Notification can allow people to cover crops, move beehives, cover sources of drinking water, close windows and take washing off the line. There is likely to be some addition hassle for sprayers to comply with this rule though notification can be carried out relatively easily (text message or email).

Option A is discarded because, with it, the problem of insufficient notification distances for aerial spraying remains.

Option B is discarded because notification is consistently rated as important for people and (in all likelihood with this option) not being notified would increase the number of incidents and community concern.

Option D is considered excessive due to the opportunity cost it will impose although it will likely reduce complaints. This assumes that there is compliance with the rule as complaints may actually rise if spraying takes place too close to the boundary in breach of any required setback.

Option E is discarded because it will impose high costs on sprayers and significantly reduce flexibility of when to spray.

7.5 Smoke

7.5.1 Executive summary

This section evaluates the options for managing smoke and burning in the new Regional Plan. The relevant Regional Plan provisions are:

Rules - D.7.1.1, D.7.1.2, D.7.1.3, D.7.1.4, D.7.1.5, D.7.1.6, D.7.1.7, D.7.1.8, D.7.1.9

Policies - D.3.1, D.3.2, D.3.5

Smoke is a visible suspension of carbon or other particles in air, typically one emitted from a burning substance. The main impact of a build-up of these pollutants is to cause adverse effects on human health. Smoke can adversely effect the most vulnerable in society (the elderly, children and those with asthma or chronic respiratory illness) and these discharges also have the potential to cause a nuisance and impact on amenity values.

Many industrial and trade activities do not require a resource consent to discharge smoke under the Regional Air Quality Plan because the adverse effects are minor and can be controlled through the sole criteria of 'no effect beyond the boundary'. These activities are listed in Appendix 5 of the Regional Air Quality Plan. However, major discharges (that is, those that discharge over a specified heat release threshold and/or release hazardous waste gases or typically have significant adverse effects) do require resource consent and there are a number of these present in Northland. These rules are believed to be working well with only minor changes proposed.

Smoke from non-industrial processes has less potential for adverse effects that are harmful to the environment and human health due to their short duration, the lesser intensity of the activity and the type of material being burnt. Despite this, the main non-industrial source of smoke – outdoor burning – does carry the potential to cause a localised nuisance and impact on amenity values. The cumulative effects of small-scale burning activities, particularly in urban areas, can also lead to more significant adverse effects.

The main issue is how we manage instances of smoke nuisance from waste burning which continue to be a source of a large number of complaints to the council. The council uses a lot of resources dealing with complaints on smoke nuisance (150-200 complaints per year). Approximately half these incidents are in the city of Whangārei (many are in breach of our rules in the current Regional Air Quality Plan). Kerikeri-Waipapa is an emerging area of concern with an increase in complaints in recent years and a reasonably fast growing community. Outside of urban areas, we receive approximately 10-20 incidents a year on rural fires lasting for longer periods of time, that is, greater than 12 hours. Additional complaints are received and responded to by district councils. Staff have collated this additional complaint data from district councils.

The following assessment is broken into four components of burning: a general approach to burning, burning agricultural bale wrap, burning of potentially hazardous substances and burning from industrial and trade premises.

General approach to burning

The preferred management option for the proposed Regional Plan is Option A, modified status quo. Essentially the activity would become a non-complying activity (it is currently a discretionary activity).

Option A is detailed in the table below:

Any other place or source	Industrial and trade
Not permitted in Whangarei and Kerikeri (subject to exceptions) unless 50 metre setback from a sensitive area, extending to 100m where the sensitive area is downwind of the fire	All areas - burning must take place in an incineration device.

Any other place or source	Industrial and trade
All other areas - permitted subject to conditions.	

Other options considered but discarded include:

- Option C, making it a prohibited activity, would have the advantage of being a straight-forward, easy to understand and enforce approach. However, as this form of plastic has lower concentrations of polycyclical aromatic hydrocarbons (chemicals known to cause cancer) and can be burnt safely under the right conditions it is more appropriate to give farmers the option to apply for a consent. Additionally, we are proposing a non-complying activity for burning of other potentially hazardous substances (see below) so this would be consistent with the overall approach.
- Option B, making burning a permitted activity, would not account for the potential health effects and the need to control burning near sensitive areas. In terms of maintaining overall air quality and not exceeding the NES Air Quality, it is unlikely there will be any change for any of the options as the activity will take place in rural, not urban areas (where the airshed boundaries are drawn). Also the activity is likely to be undertaken only very occasionally meaning it won't contribute to the day to day emission load in a particular airshed.

Burning of sileage bale wrap

The preferred management option for the proposed Regional Plan is Option A, modified status quo. Essentially the activity would become a non-complying activity (it is currently a discretionary activity).

Option A is detailed in the table below:

Any other place or source	Industrial and trade
Open burning of bale wrap is a non-complying activity	Open burning of bale wrap is a non-complying activity

Other options considered but discarded include:

- Option C, making it a prohibited activity, would have the advantage of being a straight-forward, easy to understand and enforce approach. However, as this form of plastic has lower concentrations of polycyclical aromatic hydrocarbons (chemicals known to cause cancer) and can be burnt safely under the right conditions it is more appropriate to give farmers the option to apply for a consent. Additionally, we are proposing a non-complying activity for burning of other potentially hazardous substances (see below) so this would be consistent with the overall approach.
- Option B, making burning a permitted activity, would not account for the potential health effects and the need to control burning near sensitive areas. In terms of maintaining overall air quality and not exceeding the NES Air Quality, it is unlikely there will be any change for any of the options as the activity will take place in rural, not urban areas (where the airshed boundaries are drawn). Also the activity is likely to be undertaken only very occasionally meaning it won't contribute to the day to day emission load in a particular airshed.

Burning of potentially hazardous substances

The preferred management option for the Proposed Regional Plan is Option B, the middle ground where open burning is a non-complying activity. This provides the most balance between the risk of adverse effects occurring, whilst rigorously assessing any proposals for the open burning of hazardous substances through the resource consent process.

Option B is detailed in the table below:

Any other place or source	Industrial and trade
Open burning of potentially hazardous materials a non-complying activity	Open burning of potentially hazardous materials a non-complying activity

Other options considered but discarded include:

- A prohibited activity (option C) provides the least flexibility - resource users will have to seek alternative methods of disposal with no opportunity to undertake open burning (although it is noted this is the standard approach in other regions).
- The status quo (option A) is a mixed approach which prohibits some burning but enables other burning to occur as a discretionary activity and thus can be confusing for resource and plan users.

Burning from Industrial and Trade Premises

The preferred management option is Option C. It is unlikely that there will be an increase in incidents for any of the options where the activities are already existing and the effects known (it is likely in any case that the conditions of the consent can be tightened if there are a lot of complaints arising as part of the reconsenting process - hence slightly fewer incidents across the board). It is also likely that new industrial and trade stack discharges will establish during the life of the plan but we do not consider that these will increase the number of complaints as emissions technology continues to improve. The cost of a consent under Option C could also be reduced (as compared to the Status Quo – Option A) if information requirements are restricted to a few factors, the consent is not publically notified and other effects (for example cultural or natural character effects) are not relitigated.

Option C is detailed in the table below.

Burning (<5MW coal and oil, <10MW gas, <2.5MW untreated wood)	Burning (>5MW coal and oil, >10MW gas, >2.5MW untreated wood)	Renewal of consent burning (>5MW coal and oil, >10MW gas, >2.5MW untreated wood)	Associated emissions from use of heat from burning (e.g. foundry furnaces, kiln drying...)
Permitted	Discretionary	Restricted discretionary	Discretionary

Other options considered but discarded include:

- A controlled activity (as proposed in Option B) gives more surety to the holder that the activity can continue beyond the term of the consent, providing the consent holder re-applies in time. Having a controlled activity status however might put additional pressure on the other airsheds in the region if there is an increase in emissions from other sources (for example backyard burning) as it will reduce the Council's ability to manage all discharges in the airshed. On the other hand in this instance it is more likely that Council will put restrictions on permitted activities (such as backyard burning) rather than control existing authorised discharges.
- Option A retains the status quo. Whilst there are no major problems with this approach, it does give rise to the most cost and uncertainty to existing consent holders when compared to the other more permissive options.

7.5.2 Relevant provisions

This evaluation supports the following Regional Plan provisions:

- All rules in C.7.1 - Burning
- Policy D.3.1 - General approach to managing air quality
- Policy D.3.2 - Burning and smoke generating activities
- Policy D.3.5 - Activities in the Marsden Point airshed

7.5.3 The problem, opportunity and/or requirement

Smoke is a visible suspension of carbon or other particles in air, typically one emitted from a burning substance.

Point source discharges from industrial and trade premises are generally well regulated at present and relatively easy to identify and monitor. Many industrial and trade discharges are also concentrated in dedicated industrial zones.

Industrial and trade smoke discharges can include stack emissions from the use of fuel, as well as incineration or open burning of refuse and emissions released as a by-product of other industrial processes. The nature of these discharges is varied but can include some of the following primary pollutants:

- Carbon monoxide;
- Carbon dioxide;
- Oxides of nitrogen;
- Oxides of sulfur;
- Volatile organic compounds (for example, formaldehyde, benzene);
- Particulates, including those of a course grain (greater than PM_{10}) that form visible dust (for example, fly ash, cement dust or coal dust). Industry is also more likely to generate more breathable finer dust (particles smaller than PM_{10}) such as wood smoke, than natural sources (for example, sea salt, beach sand and pollen). Finer particles accumulate further into the lungs which can cause long term health effects, and
- Heavy metals such as arsenic, chromium, cadmium, copper and tin.

An additional factor that should be considered is that mixing certain primary chemical compounds can result in more harmful synergistic effects. The combination of oxides of nitrogen and volatile organic compounds with sunlight for example can cause a build up of ozone which, at ground level, is considered a pollutant.

The main impact of a build-up of these pollutants is to cause adverse effects on human health. Smoke can adversely effect the most vulnerable in society (the elderly, children and those with asthma or chronic respiratory illness) and these discharges also have the potential to cause a nuisance and impact on amenity values.

In New Zealand generally and Northland particularly, the lack of heavy industry means industrial smoke pollution is less of an issue than in other developed countries (although people's expectations of a clean environment mean that when it does occur, the perceived impact is more significant). There are a few single large-scale industrial emitters at Marsden Point, Port Whangārei and Kaitāia (Juken Nisshu). It has been anticipated, through the Whangārei 30/50 Growth Strategy, that Marsden Point will be a source of growth for complimentary industrial uses. This growth however has not yet occurred to the extent envisaged.

Many industrial and trade activities do not require a resource consent to discharge smoke under the Regional Air Quality Plan because the adverse effects are minor and can be controlled through the sole criteria of 'no effect beyond the boundary'. These activities are listed in Appendix 5 of the Regional Air Quality Plan. However, major discharges (that is, those that discharge over a specified heat release threshold and/or release hazardous waste gases) do require resource consent. There are a number of these present in Northland. These rules are believed to be working well. Nevertheless the requirement to get a new consent for an existing authorised activity can lead to uncertainty (as the activity is a discretionary activity) and a case could be made for an easier consenting pathway for some industrial air discharges (e.g. a restricted discretionary activity).

Smoke from non-industrial processes has less potential for adverse effects that are harmful to the environment and human health due to their short duration, the lesser intensity of the activity and the type of material being burnt. Despite this, the main non-industrial source of smoke – outdoor burning – does carry the potential to cause a localised nuisance and impact on amenity values. The cumulative effects of small-scale burning activities, particularly in urban areas, can also lead to more significant adverse effects.

General Burning of Waste

Open burning certain materials, such as bitumen on road, metal coated cables, tyres, oil and waste and gas at landfills have the potential to release toxic substances into the atmosphere. The open burning of these materials is prohibited under the National Environmental Standard – Air Quality (subject to certain exceptions). Open burning of other potentially hazardous materials (materials which when burnt can release hazardous substances), such as treated timber, is currently prohibited in the Regional Air Quality Plan. Open burning of other potentially hazardous material, such as plastics, is a discretionary activity. Council sometimes receives requests to openly burn potentially hazardous materials under controlled conditions (for example for research and development purposes) however under the existing Regional Air Quality Plan, this is either a discretionary activity or a prohibited activity depending on the material. A shift to a non-complying activity status for the open burning of these materials would provide a 'middle ground' and an opportunity to 'test' each one of these requests on its merits through the consenting process.

Council also sometimes receives requests to burn bale wrap (which is comprised of a type of plastic known as low density polyethylene). This is currently not a permitted activity although it is less harmful than burning halogenated plastics and there are limitations on alternative disposal opportunities in Northland (see below).

The Regional Air Quality Plan has a generally permissive approach to the burning of non-hazardous waste however a local response has been needed in some areas. This has, to date, taken the form of Plan Change 2 (Backyard Burning) which was implemented in the Whangarei airshed as a response to evidence that:

- the burning of waste materials in back gardens may be contributing to health problems in vulnerable parts of the population, and
- a high number of complaints received on smoke and burning nuisance, and
- the increased probability of an exceedance of the National Environmental Standard for Air Quality (NESAQ) for PM^{10}..

As such, within the Whangārei airshed, backyard burning now requires a resource consent (with some exceptions). Outside of Whangārei these restrictions do not exist and there are no restrictions other than a requirement to avoid smoke nuisance to neighbours.

The main issue is how we manage the ongoing effects smoke nuisance from waste burning. The council uses a lot of resources dealing with complaints on smoke nuisance (150-200 complaints per year). Approximately half these incidents are in the city of Whangārei (many are in breach of our rules in the current Regional Air Quality Plan). Outside of urban areas, we receive approximately 10-20 incidents a year on rural fires lasting for longer periods of time, that is, greater than 12 hours. It is not always possible to determine if there has been a nuisance (after the material has been burnt or the wind has changed direction, for example).

It is noted that we often require notification for spraying but, arguably, burning can have a greater impact on amenity than spraying, which can be more carefully controlled. Obviously the smokier the fire (for example, when burning wet material) the higher the likelihood of creating a nuisance.

Burning in other urban areas of Northland

Extending controls on backyard burning to other areas of Northland was not explored in any great detail as part of the work on the draft plan but further research has been taken since by Council staff. This was because of a recognition that this issue had not been fully explored since 2007 when the backyard ban was instigated in Whangarei and that more information was now available. This included continuous PM_{10} monitoring and analysis of complaint data. Where continuous monitoring has occurred, data shows that these other localities have been well within the requirements set by the NES (this includes Kaitaia and Kerikeri). The case for extending backyard burning restrictions to other locations is therefore most robust when based on the number of complaints received. This can be a useful indicator that smoke nuisance is an issue for the community and adverse effects may be occurring.

Complaint data is collected from a number of agencies. In Whangarei District, complaint response for outdoor burning is largely a matter for the regional council. In Kaipara District, the district council tends to respond to complaints in urban areas with the regional council responding to complaints in both urban and rural areas. In Far North District, the district council responds to many of the complaints.

To get a fuller picture, complaint data was sought for the last 5 years (from 1 Jan 2012 through to 2017) from Far North and Kaipara District Councils. When adding this to information the regional council already holds on the number and nature of complaints received, a pattern emerges of where the hotspots are. Top of the list and with the most robust case for a rule change is Kerikeri receiving 133 complaints (including Waipapa) since 2012. This averages 26.6 complaints a year or 3.8 complaints per 1000 people per year (the population of Kerikeri being around 7000). By comparison Kaikohe received 58 complaints since 2012. This averages 11.6 complaints a year or 2.6 complaints per 1000 people per year. (the population of Kaikohe being around 4400). Kaitaia and Dargaville both recorded fewer complaints than Kaikohe over this period and with larger populations (Dargaville is around 5000 and Kaitaia 5600) the number of complaints per 1000 people is smaller. It should be noted that some double counting is possible where the same complaint has been referred to both the district and regional council.

Kerikeri-Waipapa is a growth area with the population set to increase to over 8000 by the mid 2020s (Stats NZ population projections, 2013 base to 2043, released December 2016). This is precipitated by a growth in 'lifestyle' subdivision so it is possible that complaints will increase in future years as people seek to burn-off vegetation on medium sized lifestyle blocks. Horticulture is also a key industry in this area and the burning of waste vegetation material can occur from time to time. Given the potential for conflict and the number of complaints, including the number of complaints per capita, a suggested remedy is to set-back fires 50 metres from neighbouring houses or 100 metres where the wind is blowing in that direction. Whilst larger lots may be able to meet this condition, it would mean that people living on smaller 'town' lots would be unable to comply and be unable to burn, meaning they would have to seek alternative disposal methods.

Burning of silage bale wrap

Silage wrap is comprised of a plastic known as Low Density Polyethylene (LDP) which is different in chemical structure to halogenated plastics, that is, plastic comprised of substances from the halogen class of elements – chiefly chlorine. The evidence suggests that burning LDP is less harmful than halogenated plastics however a fire needs to be at a relatively high temperature to effectively burn the material (Wrobel and Reinhardt, 2003). This is particularly true in an open burning situation where initial temperatures are relatively low, between 250 to 600°C. As the temperature heats up to over 1000°C, more combustion occurs but most material will have already broken down through decomposition rather than burnt properly through combustion. The emissions from a low temperature burn would include some cancer causing polycyclic aromatic hydrocarbons (but less than found in halogenated plastic). Improperly burnt plastic does carry the risk of contamination by dioxins in the soil (burning 4,500 kg of agricultural plastic has the potential to contaminate 75,000 kg of soil from exposure to dioxins – Ontario Waste Study, July 2011).

Of the 16 regional/unitary areas in New Zealand, 7 prohibit burning of bail wrap, 4 permit burning, 1 permits burning unless a national stewardship scheme has been established in the area, 1 permits burning in rural areas only due to a lack of alternatives and 1 is unclear. Northland is the only region to require a resource consent . Most regions permit the burial of plastics (but not agrichemical containers). Some regions that permit burning have older air plans and it is possible they will move to a more restrictive regime in the future (Otago and West Coast will review their first generation air plans in the near future). This has been the prevailing trend in recent years with Canterbury being one of the more recent regions to prohibit burning polyethylene. The general reason is because recycling and burial options exist as alternatives and there is no reason to burn. Other regions such as Taranaki have taken a different position. A representative from Taranaki stated (paraphrased) commented: *We have the view that the burning of unchlorinated plastic film (bale wrap) in an appropriate manner on a farm has minimal environmental effects, and on that basis a regional council would be hard-pushed in law to promulgate a rule that is not necessary on environmental grounds. Plastic film fed slowly onto a roaring fire of untreated wood will burn completely for all intents and purposes, without effects on the natural environment or on neighbouring farms.*

The Draft Regional Plan included provisions permitting the burning of sileage bale wrap based on the above information however after consultation had closed, it was clear there was a strong feeling that silage wrap should not be burnt as a permitted activity with over 90 submissions, most of them opposed. The main objections raised were that it appeared to be a retrograde step (the current Regional Air Quality Plan requires consent be applied for) and that the burning of plastics would lead to toxins being released into the air with negative environmental and health effects.

Some more specific comments received included:

Recycling Alternatives Available - an accredited Product Stewardship scheme is available for farmers and growers and materials covered by Plasback schemes. The Plasback scheme has witnessed 10 years of consecutive growth and has collected over 7200 tonnes since inception in 2006. It provides rural employment opportunities for collectors and balers with collection and baling fees are paid direct to contractors. The costs of collections from farms has not increased in 10 years and remains an affordable option to recycle agricultural bale wrap because, as more farmers take part the scheme providers can maintain

the collection costs for longer without increasing the cost. If permitted, burning will become a much cheaper option for farmers. Northland is a geographically difficult area in which to operate and, therefore, it is important to gain a critical mass of farmers using the Plasback collection scheme.

The Rural Waste Minimisation Project, on behalf of Environment Canterbury, is seeking to provide better waste management options for farmers and growers with the view to increasing the volume of waste collected from rural properties and to identify alternatives to the current options of burning, burying and storing waste on farms. Allowing the burning of agricultural plastic in Northland will run counter to the aims of this project. Evidence from the growth of the Plasback scheme highlights that, in areas where the burning of agricultural plastics is banned, a far greater uptake of the recycling scheme is apparent. Permitting burning of plastics is counter to the efforts to develop Product Stewardship in New Zealand.

Separation of waste streams - farmers may not separate materials for burning, rather all materials are burnt together, and this causes issues of contaminants to be discharged to air.

Difficulty in achieving combustion -for best results, the plastic needs to be vapourised at high temperature. A fire needs to be at relatively high temperature 900 to 1100 degrees celsius'. This would be hard to achieve as bail wrap can get wet and muddy.

Undermine recycling efforts outside the region - If burning is permitted, there would be nothing stopping anyone bringing large quantities of plastic from outside of Northland to dispose of here.

Undermine NRC subsidisation of Plasback - It was also noted that NRC was helping to fund Plasback in the region through the NRC Annual Plan (a contribution in 2016/17 of $4000).

The above information has been factored into this updated S32 assessment.

Burning from industrial and trade premises for energy generation

As described above, a number of large industrial emitters exist in the region who have consents to discharge to air. During the consultation on the draft regional plan, several large industrial emitters advanced the case that because their emissions were known and had been previously authorised, they should be controlled or restricted discretionary activities. Further evaluation will explore this approach below. It is noted that some other regions plans use this approach. For example:

- Gisborne District Council currently permit conventional gas-fired fuel burning equipment greater than 5 megawatts but less than 50 megawatts subject to conditions.
- Waikato Regional Council currently have a restricted discretionary activity status for untreated wood and paper with a rate of heat release exceeding five megawatts from activities lawfully established before the date of notification of the plan and two megawatts from activities lawfully established after the date of notification of the plan.
- Waikato Regional Council currently have a controlled activity status for coal or gas up to 50MW where previously lawfully established.
- Auckland Council have split rules for 'very small, small, medium and large scale combustion sources' with certain medium combustion sources controlled activities and medium - large scale combustion sources restricted discretionary. 'Medium' combustion sources and thresholds include: wood 500kW - 2MW, light fuel oil (excluding waste oil) <10MW, natural gas or liquefied petroleum gas 2 MW - 10 MW or diesel 500kW - 10 MW. 'Medium to large' combustion sources include: natural gas or liquefied petroleum gas 22MW - 33MW; or b) diesel or light fuel oil 10MW - 20MW, wood 2MW - 10MW, natural gas, liquefied petroleum gas or diesel 10MW - 20MW.

7.5.4 Management options

This section summarises the management options for smoke. It is split into options dealing with burning generally and options for the burning of silage bale wrap. The intention is not to identify every different combination of approach, as there would be many, but to represent the range of options and highlight key differences in approaches.

General burning of waste

Under RMA Section 15 (2A), discharges from a place or any other source into air are not allowed if they contravene a rule unless allowed by a consent or national environmental standard. Under 15(1) RMA, for industrial and trade premises the opposite assumption prevails - that a consent is always required unless permitted by a rule. This explains the division in the tables below between any other place or source and industrial and trade premises.

Assumption - burning only relates to non-hazardous materials (e.g. wood, paper, cardboard, vegetation).

The key differences between the options focus on whether to:

1) retain the current approach (the status quo) to restrict burning in main urban areas (currently Whangarei).
2) require greater use of good management practices as part of a permitted activity
3) require notification standards for burning activity
4) require mandatory setbacks for burning activity
5) expand the scope of where a resource consent is required.

Option A: status quo

Overview: retain status quo approach where most outdoor 'backyard' burning activities are permitted except in Whangarei where most backyard burning requires a resource consent.

Background: this option is the status quo and is based on the existing Regional Air Quality Plan.

Any other place or source	Industrial and trade
Not permitted in Whangarei (subject to exceptions) Permitted elsewhere	Not permitted in Whangarei or elsewhere unless in an incineration device.

Option B: greater user of performance standards

Overview: retain status quo but greater use of performance standards where the activity is permitted.

Background: this option would introduce additional performance standards - for example, avoid burning when wet and have regard to wind direction. This approach is used in some other regions - such as the Proposed Air Plan (Environment Canterbury).

Any other place or source	Industrial and trade
Not permitted in Whangarei (subject to exceptions) Permitted elsewhere - greater use of performance standards	Not permitted in Whangarei or elsewhere unless in an incineration device.

C: notifying neighbours of burning activities

Overview: this options requires that neighbours are notified under certain circumstances before burning activities are undertaken.

Background: neighbour notification is not used in the existing Regional Air Quality Plan. Notification under this option would be restricted to those circumstances where fires are of long duration (>24hrs).

Any other place or source	Industrial and Trade
Not permitted in Whangarei (subject to exceptions) Permitted elsewhere–notification of burning required for fires >24hrs.	Not permitted in Whangarei or elsewhere unless in an incineration device.

Option D: use of buffer zones in selected areas

Overview: incorporates Option C and requires that outdoor burning take place a certain distance back from a sensitive area on a neighbouring property.

Background: this approach would add a requirement not currently in the existing regional air quality plan to set back burning from the boundaries of sensitive areas [(1)] are defined as on neighbouring properties. The application of this rule would be restricted to certain areas and would automatically include the only current area covered by prohibitions on backyard burning - currently just Whangarei city. One other area has been assessed as suitable to apply a restrictive setback approach - the Kerikeri - Waipapa area, based on complaints received by Far North District Council and the regional council. . Under this option, a 50 metre setback from a sensitive area is likely to be appropriate, extending to 100m where the sensitive area is downwind of the fire. This would have the practical effect of curtailing the ability of those on small town sized lots to burn.

This approach is used elsewhere in the country - for example Otago (Regional Air Plan) in certain localities.

Any other place or source	Industrial and Trade
Not permitted in Whangarei and Kerikeri (subject to exceptions) unless 50 metre setback from a sensitive area, extending to 100m where the sensitive area is downwind of the fire All other areas - permitted subject to conditions.	All areas - burning must take place in an incineration device.

Option E: use of buffer zones everywhere

Overview: a broader application of Option D so that any outdoor burning activity must comply with a setback rule from a sensitive area (also incorporates Option C) .

Background: under this option, a 50 metre setback from a sensitive area, extending to 100m where the sensitive area is downwind of the fire, would be extended around the region. This approach is proposed in Canterbury through the Proposed Regional Air Plan (an additional restriction of a minimum lot size of 2ha applies).

Any other place or source	Industrial and trade
Not permitted region-wide (subject to exceptions) unless 50 metre setback from a sensitive area, extending to 100m where the sensitive area is downwind of the fire	All areas - burning must take place in an incineration device.

Option F: resource consent required

Overview: requires that any discharge giving rise to smoke requires a resource consent.

1 which in relation to smoke include residential buildings and gardens, schools, hospitals and care facilities, parks and reserves and community buildings

Background: this is a conservative approach that would require any activity likely to generate smoke to obtain resource consent. The activity status would shift from a permitted to a controlled activity.

Any other place or source	Industrial and trade
Require a consent for any burning of waste (controlled activity)	Require a consent for any burning of waste (controlled activity)

Open burning of silage bale wrap

The key differences between the options focus on the application of various levels of Council control. The options range from light regulation through to the highly restrictive approach outlined in Option C. The range of options include:

1) Modified status quo – burning of bale wrap is a non-complying activity.
2) Permitted activity subject to no offensive and objectionable effects across the boundary.
3) Prohibit the burning of bale wrap

Option A: modified status quo

Overview: modified status quo approach – open burning of bale wrap a non-complying activity.

Background: this option is based on the existing Regional Air Quality Plan. Rather than a discretionary activity in the current plan, it is proposed open burning bale wrap be a non-complying activity. This aligns with the approach taken with all other types of plastic. As a general principle we are proposing that the open burning of other types of plastic was a prohibited activity but it is proposed to increase the flexibility of our rules and to enable the possibility of open burning in exceptional cases).

Any other place or source	Industrial and trade
Open burning of bale wrap is a non-complying activity	Open burning of bale wrap is a non-complying activity

Option B: burning permitted

Overview: open burning of bale wrap from any other place or source is a permitted activity subject to no offensive and objectionable effects across the boundary.

Background: open burning bale wrap is permitted. This approach is used in several other regions, for example, Horizons, Taranaki and Waikato.

Any other place or source	Industrial and trade
Permitted activity	Non-complying activity

Option C: burning prohibited

Overview: open burning bale wrap is a prohibited activity and no consent can be applied for.

Background: open burning bale wrap is prohibited. This is the approach taken in a large majority of other regions plans (seven).

Any other place or source	Industrial and trade
Prohibited activity	Prohibited activity

Open burning of potentially hazardous substances

Option A: Status Quo

Overview: The status quo approach.

Background: This option is the status quo and is based on the existing Regional Air Quality Plan.

Any other place or source	Industrial and trade
Open burning of potentially hazardous materials either a discretionary or prohibited activity	Open burning of potentially hazardous materials either a discretionary or prohibited activity

Option B: Middle Ground

Overview: Open burning of specified materials that are currently discretionary and prohibited activities shift to a non-complying activity.

Background: Not based on any other region's plans. A 'middle ground' option.

Any other place or source	Industrial and trade
Open burning of potentially hazardous materials a non-complying activity	Open burning of potentially hazardous materials a non-complying activity

Option C: Strict approach

Overview: Open burning of specified materials a prohibited activity.

Background: The approach taken in other regions.

Any other place or source	Industrial and trade
Open burning of potentially hazardous materials a prohibited activity	Open burning of potentially hazardous materials a prohibited activi

Burning from industrial and trade premises for energy generation

Option A: status quo

Overview: retain status quo approach as per table below.

Background: this option is the status quo and is based on the existing Regional Air Quality Plan.

Burning (<5MW coal and oil, <10MW gas, <2.5MW untreated wood)	Burning (>5MW coal and oil, >10MW gas, >2.5MW untreated wood)	Renewal of consent (>5MW coal and oil, >10MW gas, >2.5MW untreated wood)	Associated emissions from use of heat from burning (e.g. foundry furnaces, kiln drying...)
Permitted	Discretionary	Discretionary	Discretionary

Option B: New rule for re-consenting boilers - most permissive

Overview: retain approach as for Option A for newly established boilers but introduce an easier path to re-consenting by simply making all industrial boiler consent renewals a controlled activity.

Background: this option is the most permissive option. Other regions, for example Waikato, enable the reconsenting of gas and coal (but not wood which is a restricted discretionary activity) up to 50MW as a controlled activity. This option would go further by including wood and not setting an upper limit (e.g. 50MW) for the renewal as a controlled activity.

Burning (<5MW coal and oil, <10MW gas, <2.5MW untreated wood)	Burning (>5MW coal and oil, >10MW gas, >2.5MW untreated wood)	Renewal of consent burning (>5MW coal and oil, >10MW gas, >2.5MW untreated wood)	Associated emissions from use of heat from burning (e.g. foundry furnaces, kiln drying...)
Permitted	Discretionary	Controlled	Discretionary

Option C: New rule for re-consenting boilers - moderately permissive

Overview: retain approach as for Option A for newly established boilers but introduce an easier path to re-consenting by simply making all industrial boiler consent renewals a restricted discretionary activity.

Background: this options is moderately permissive. It is not replicated in other regional plans (the Waikato Regional Plan for example is both more permissive and less permissive in that a controlled activity status is available for the reconsenting of gas and coal air discharges consents but this is limited to 50MW, whereas this option would have an unlimited heat release threshold).

Burning (<5MW coal and oil, <10MW gas, <2.5MW untreated wood)	Burning (>5MW coal and oil, >10MW gas, >2.5MW untreated wood)	Renewal of consent burning (>5MW coal and oil, >10MW gas, >2.5MW untreated wood)	Associated emissions from use of heat from burning (e.g. foundry furnaces, kiln drying...)
Permitted	Discretionary	Restricted discretionary	Discretionary

7.5.5 High level objectives, measures and information sources

Section 32 requires an assessment of "*...the efficiency and effectiveness of the provisions in achieving the objectives...*". Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section 1.6 'Evaluation approach' for more details.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. They signal a direction for where we want to head, without stating how far we go – that comes later (they are the beginnings of objectives).

Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against.

The below objectives and measures apply to both general burning of waste, burning from industrial and trade premises for energy generation and the burning of bale wrap.

Objective	Measure
Minimise cross-boundary adverse effects from smoke and burning discharges. Minimise cost to council in dealing with complaints on burning.	1 = significantly more incidents. 2 = moderately more incidents. 3 = slightly more incidents. 4 = same number of incidents. 5 = slightly fewer incidents. 6 = moderately fewer incidents. 7 = significantly fewer incidents. 8 = no incidents.
Minimise compliance costs/hassle factor for resource users.	1 = significantly more cost/hassle (real restrictions on what people can do). 2 = moderately more cost/hassle. 3 = slightly more cost/hassle. 4 = same as currently. 5 = slightly less cost/hassle. 6 = moderately less cost/hassle. 7 = significantly less cost/hassle. 8 = no cost/hassle (no restrictions on what people can do).
Maintain ambient air quality	1 = significant risk of exceedance of NES Air Quality 2 = moderate risk of exceedance of NES Air Quality 3 = slight risk of exceedance of NES Air Quality (current risk for Whangarei airshed) 4 = very slight risk of exceedance of NES Air Quality (current risk for all other airsheds) 5 = reduced risk of exceedance of NES Air Quality (compared with current risk)

Explanation for the high level objectives and measures

Minimise cross-boundary adverse effects from smoke and burning discharges and minimise cost to council in dealing with complaints on burning

Smoke can have a significant adverse effect on certain sensitive areas. Sensitive areas in relation to smoke include homes, businesses, schools and hospitals. When people experience unwanted smoke drifting across the boundary, they are more likely to contact the council, where an environmental incident is raised. This is why this measure has been chosen as it generally relates well to the outcome. The cost to council (or its contractor) arises from having to investigate the source of the smoke complaint and take necessary enforcement measures. The time taken to investigate an incident can be quite short if there is an obvious smoke complaint, which can be viewed from a public place, but longer if access to the land must be sought and the material being burnt is unclear (such as when waste streams are mixed). Generally an hour is a reasonable average to investigate a complaint although travel time can extend this – there is then the need to follow up with enforcement action where necessary. Having more incidents would obviously create more demand on council contractors to investigate complaints.

Minimise compliance costs/hassle factor

Limiting peoples right to burn can cost money (if they have to, for example, take waste to landfill or pay recycling costs). Notification requirements and other performance standards can also be a hassle for those carrying out the activity. It is therefore appropriate to consider the effects any rule change will have on the ability of those wishing to burn to comply with new rules and those costs that may arise. In relation to an air discharge consent, the costs are as follows (includes GST):

- $3144 – limited notified/notified discharge consent.
- $838 – non notified discharge consent.
- $63 – discharge permit of wood, paper, cardboard or vegetation in Whangārei airshed.

In relation to the burning of bale wrap, in addition to applying for a consent to burn, there are two alternative methods, burying and recycling:

- The cost to burying is minimal and the plastic is relatively inert once in the ground. It could be buried in existing farm dumps for instance.
- Plasback state that the cost of recycling is $40+GST per liner including pickup. The wrap does need to be relatively free of soiling and wetness.

Maintain ambient air quality

The region has 5 gazetted airsheds in the region - 5 for PM_{10} and 1 for SO_2. Under the NES Air Quality, there must not be more than one exceedance of PM10 (an exceedance is more than 50ugm) in a 24 hour period annually or more than 9 exceedances of SO_2 (350ugm in a 1 hour mean annually). There are various requirements triggered for the regional council to follow if a breach occurs, including a requirement to decline resource consents for any new air discharge in an airshed. It is therefore important that any decision a council makes, such as a more permissive consenting approach, does not lead to a breach in the NES Air Quality. The measure qualifies the risk of an exceedance happening for each option. It is considered that there is only a slight risk of the NES Air Quality being exceeded in Whangarei where there are typically spikes in PM10 in the winter months. However no exceedances of the national standards have been recorded since 2011. The other airsheds, where monitored, have never exceeded national standards and are unlikely to do so.

7.5.6 Evaluating the management options

General approach to burning – options assessment

High level objective and measure	A. Status quo	B. Promote good practice	C. Enhanced notification	D. Buffer zones (Whangarei and Kerikeri)	E. Buffer Zones (Region - Wide)	F. Consent required
Minimise cross-boundary adverse effects from smoke and burning discharges. Minimise cost to council in dealing with complaints on burning.	4 = same number of incidents.	4 = same number of incidents.	5 = slightly fewer incidents.	5 = slightly fewer incidents.	6 = moderately fewer incidents.	6 = moderately fewer incidents.

High level objective and measure	A. Status quo	B. Promote good practice	C. Enhanced notification	D. Buffer zones (Whangarei and Kerikeri)	E. Buffer Zones (Region - Wide)	F. Consent required
Measure: Number of environmental incidents reported to Council						
Minimise compliance costs/hassle factor for resource users. *Measure: Cost/hassle to resource users*	4 = same as currently.	4 = same as currently.	3 = slightly more costly/hassle.	2 = moderately more cost/hassle	1 = significantly more cost/hassle	1 = significantly more cost/hassle
Maintain ambient air quality *Measure: Risk of exceeding the National Environmental Standards on Air Quality*	3 = Slight risk of exceedance in in Whangarei airshed 4 = very slight risk of exceedance in other airsheds	3 = Slight risk of exceedance in in Whangarei airshed 4 = very slight risk of exceedance in other airsheds	3 = Slight risk of exceedance in in Whangarei airshed 4 = very slight risk of exceedance in other airsheds	3 = Slight risk of exceedance in Whangarei airshed 4 = very slight risk of exceedance in other airsheds	3 = Slight risk of exceedance in Whangarei airshed 5= reduced risk of exceedance in other airsheds	3 = Slight risk of exceedance in in Whangarei airshed 5= reduced risk of exceedance in other airsheds

Certainty about the evaluation

There is always uncertainty about the potential impacts of management options. We're moderately confident about the accuracy of the evaluation for these five options. We don't think it would be viable and/or worthwhile to get more information to increase the accuracy of our evaluation. The main reason being that it is very unlikely to change the relative differences between the options. They are a judgement of how people will respond – inherently a judgement of people's responses has a degree of uncertainty.

Time-frame of the evaluation

The evaluation is made over the life-time of the plan (10-15 years).

The preferred management option

The preferred management option for the new Regional Plan is Option D: Buffer Zones in Whangarei and Kerierki incorporating Option C region-wide. Option D is, on the face of it, a relatively effective option for reducing complaints and easy to enforce however there will be a moderate hassle to residents in Kerikeri where it is to be applied. Residents on smaller lots will effectively be unable to burn waste without getting a resource consent but can utilise alternative disposal methods such as recycling or composting. As a similar approach is currently in place in Whangarei (small lot backyard fires are effectively banned), there will be no change to cost/hassle factor in the city. It is proposed that this approach be bundled with the 'enhanced notification' (Option C) to apply in certain circumstances (for example planned burn-offs lasting more than 24hrs).

Other options considered but discarded include:

- Option A retains the current approach to no real benefit but neither does it create any additional costs.
- Option B is not particularly effective by itself – it is likely that it will be hard to enforce and ultimately not make much difference for this reason.
- Option E and F are likely to lead to a lot of hassle, especially in light of the fact that there are a reduced range of alternative disposal options in rural areas. They will on the other hand be easier for Council staff to enforce as staff can determine proximity to the boundary from a fire site or whether a resource consent is held. This may reduce incidents in the long term, however this factor is outweighed by the inconvenience and cost to those carrying out the activity.

Burning of bale wrap – options assessment

High level objective and Measure	A. Modified status quo	B. Permitted activity	C. Prohibited activity
Minimise cross-boundary adverse effects from smoke and burning discharges. Minimise cost to council in dealing with complaints on burning. *Measure: Number of environmental incidents reported to Council*	4 = same number of incidents.	2 = moderately more incidents.	5 = slightly fewer incidents
Minimise compliance costs/hassle factor for resource users. *Measure: Cost/hassle to resource users*	4 = same as currently.	6 = moderately less cost/hassle.	3 = slightly more cost/hassle
Maintain ambient air quality *Measure: Risk of exceedance of the National Environmental Standards on Air Quality*	3 = Slight risk of exceedance in in Whangarei airshed 4 = very slight risk of exceedance in other airsheds	3 = Slight risk of exceedance in in Whangarei airshed 4 = very slight risk of exceedance in other airsheds	3 = Slight risk of exceedance in in Whangarei airshed 4 = very slight risk of exceedance in other airsheds

Certainty about the evaluation

There is always uncertainty about the potential impacts of management options. We're moderately confident about the accuracy of the evaluation for these options. We don't think it would be viable and/or worthwhile to get more information to increase the accuracy of our evaluation. The main reason being that it is very unlikely to change the relative differences between the options. They are a judgement of how people will respond – inherently a judgement of peoples responses has a degree of uncertainty.

Time-frame of the evaluation

The evaluation is made over the life-time of the plan (10-15 years).

The preferred management option

The preferred management option for the proposed Regional Plan is Option A, modified status quo. Essentially the activity would become a non-complying activity (it is currently a discretionary activity).

Other options considered but discarded include:

- Option C, making it a prohibited activity, would have the advantage of being a straight-forward, easy to understand and enforce approach. However, as this form of plastic has lower concentrations of polycyclical aromatic hydrocarbons (chemicals known to cause cancer) and can be burnt safely under the right conditions it is more appropriate to give farmers the option to apply for a consent. Additionally, we are proposing a non-complying activity for burning of other potentially hazardous substances (see below) so this would be consistent with the overall approach.
- Option B, making burning a permitted activity, would not account for the potential health effects and the need to control burning near sensitive areas. In terms of maintaining overall air quality and not exceeding the NES Air Quality, it is unlikely there will be any change for any of the options as the activity will take place in rural, not urban areas (where the airshed

boundaries are drawn). Also the activity is likely to be undertaken only very occasionally meaning it won't contribute to the day to day emission load in a particular airshed

Burning of potentially hazardous substances - options assessment

High level objective and Measure	A. Status quo	B. Middle ground	C. Prohibited activity
Minimise cross-boundary adverse effects from smoke and burning discharges. Minimise cost to council in dealing with complaints on burning. *Measure: Number of environmental incidents reported to Council*	4 = same number of incidents.	4 = same number of incidents.	5 = slightly fewer incidents
Minimise compliance costs/hassle factor for resource users. *Measure: Cost/hassle to resource users*	4 = same as currently.	5 = slightly less cost/hassle	2 = moderately more cost/hassle
Maintain ambient air quality *Measure: Risk of exceedance of the National Environmental Standards on Air Quality*	3 = Slight risk of exceedance in in Whangarei airshed 4 = very slight risk of exceedance in other airsheds	3 = Slight risk of exceedance in in Whangarei airshed 4 = very slight risk of exceedance in other airsheds	3 = Slight risk of exceedance in in Whangarei airshed 4 = very slight risk of exceedance in other airsheds

Certainty about the evaluation

There is always uncertainty about the potential impacts of management options. We're moderately confident about the accuracy of the evaluation for these options. We don't think it would be viable and/or worthwhile to get more information to increase the accuracy of our evaluation. The main reason being that it is very unlikely to change the relative differences between the options. They are a judgement of how people will respond – inherently a judgement of peoples responses has a degree of uncertainty.

Time-frame of the evaluation

The evaluation is made over the life-time of the plan (10-15 years).

The preferred management option

The preferred management option for the Proposed Regional Plan is Option B, the middle ground where open burning is a non-complying activity. This provides the most balance between the risk of adverse effects occurring, whilst rigorously assessing any proposals for the open burning of hazardous substances through the resource consent process.

Other options considered but discarded include:

- A prohibited activity (option C) provides the least flexibility - resource users will have to seek alternative methods of disposal with no opportunity to undertake open burning (although it is noted this is the standard approach in other regions).
- The status quo (option A) is a mixed approach which prohibits some burning but enables other burning to occur as a discretionary activity and thus can be confusing for resource and plan users.

Burning from Industrial and Trade Premises - options assessment

High level objective and Measure	A. Status quo	B. New rule for re-consenting boilers - most permissive	C. New rule for re-consenting boilers- moderately permissive
Minimise cross-boundary adverse effects from smoke and burning discharges. Minimise cost to council in dealing with complaints on burning. *Measure: Number of environmental incidents reported to Council*	5 = slightly fewer incidents.	5 = slightly fewer incidents.	5 = slightly fewer incidents.
Minimise compliance costs/hassle factor for resource users. *Measure: Cost/hassle to resource users*	4 = same as currently.	6 = moderately less cost/hassle.	5 = slightly less cost/hassle.
Maintain ambient air quality *Measure: Risk of exceedance of the National Environmental Standards on Air Quality*	3 = Slight risk of exceedance in in Whangarei airshed 4 = very slight risk of exceedance in other airsheds	3 = Slight risk of exceedance in Whangarei airshed 3 = Slight risk of exceedance in other airsheds	3 = Slight risk of exceedance in Whangarei airshed 4 = very slight risk of exceedance in other airsheds

Certainty about the evaluation

There is always uncertainty about the potential impacts of management options. We're moderately confident about the accuracy of the evaluation for these options. We don't think it would be viable and/or worthwhile to get more information to increase the accuracy of our evaluation. The main reason being that it is very unlikely to change the relative differences between the options. They are a judgement of how people will respond – inherently a judgement of peoples responses has a degree of uncertainty.

Time-frame of the evaluation

The evaluation is made over the life-time of the plan (10-15 years).

The preferred management option

The preferred management option is Option C. It is unlikely that there will be an increase in incidents for any of the options where the activities are already existing and the effects known (it is likely in any case that the conditions of the consent can be tightened if there are a lot of complaints arising as part of the reconsenting process - hence slightly fewer incidents across the board). It is also likely that new industrial and trade stack discharges will establish during the life of the plan but we do not consider that these will increase the number of complaints as emissions technology continues to improve. The cost of a consent under Option C could also be reduced (as compared to the Status Quo – Option A) if information requirements are restricted to a few factors, the consent is not publically notified and other effects (for example cultural or natural character effects) are not relitigated.

Other options considered but discarded include:

- A controlled activity (as proposed in Option B) gives more surety to the holder that the activity can continue beyond the term of the consent, providing the consent holder re-applies in time. Having a controlled activity status however might put additional pressure on the other airsheds in the region if there is an increase in emissions from other sources (for example backyard burning) as it will reduce the Council's ability to manage all discharges in the airshed. On the other

hand in this instance it is more likely that Council will put restrictions on permitted activities (such as backyard burning) rather than control existing authorised discharges.

- Option A retains the status quo. Whilst there are no major problems with this approach, it does give rise to the most cost and uncertainty to existing consent holders when compared to the other more permissive options.

7.6 Dust

7.6.1 Executive summary

This section evaluates the options for managing dust in the new Regional Plan. The relevant Regional Plan provisions are:

- Rules - D.7.2.1, D.7.2.2, D.7.2.4, D.7.2.5, D.7.2.6, D.7.2.7.
- Policies - D.3.1, D.3.3

Dust can come from a number of sources including quarrying operations, earthworks, the use of vehicles on unsealed surfaces, abrasive blasting and the loading, unloading and application of various materials (for example, sand, cement clinker, and fertilisers).

Dry abrasive blasting

Abrasive blasting is a method of cleaning surfaces using silica or other mediums. . Abrasive blasting produces dust at higher rates than other activities although wet abrasive blasting introduces fluids into the application process - reducing the amount of dust compared to dry abrasive blasting. The long-term inhalation of dust from abrasives containing high free silica may cause silicosis, a lung disease. Dust from abrasive blasting is also likely to be contaminated with the material that is removed from the object being blasted. It may contain heavy metals or other contaminants which, when deposited in water, can accumulate in sediments causing adverse effects on aquatic life.

Booth spraying can generally internalise adverse effects through good filtration methods to the extent that we recommend this activity is permitted. Open air spraying has the potential to cause greater effects, however, better methods now exist to minimise these effects (including the use of low dust alternatives) that suggest a prohibited status (which is the current activity status, unless the object is incapable of being accommodated in a booth) is no longer appropriate.

The preferred management option for the Regional Plan is Option B: permissive which enables booth blasting to take place as a permitted activity. The reason for this is that it is unlikely the number of complaints we get will change if booth blasting is permitted – we get few anyway and rarely from blasting booths. Outdoor blasting, which is much more likely to give rise to effects, will be a discretionary activity (rather than a discretionary or prohibited activity under current rules). Emission control standards will in any case be retained for booth blasting in the form of a permitted activity, which will protect amenity while avoiding the need for a consent.

Option B is detailed in the table below:

Blasting booth	Outdoor – cannot fit in booth (includes mobile blasting)	Outdoor can fit in booth
Permitted	Discretionary	Discretionary

Option A, which is the status quo, is discounted because under this option booth blasters still require a consent for no real benefit. Option C - which is a more permissive approach permitting outdoor dry abrasive blasting - is discounted because outdoor blasting needs more control than booth blasting, can by definition occur anywhere, and making it a permitted activity will make it harder to control effects on nearby sensitive areas.

Dust from unsealed public roads

There is currently no management of dust from unsealed public roads in regional plans – this is therefore a permitted activity under s15(2A) RMA. The issue of dust on public roads has been of considerable public interest recently. Following continual complaints of dust nuisance from properties adjacent to unsealed roads, the regional council undertook monitoring (using an E-BAM monitoring device) at four of the worst affected sites in Northland. The exercise was repeated in 2014/15 and 2015/16. On occasion some of the sites monitored have exceeded national environmental standards for air quality.

Noting the problem, Northland's councils, Northland District Health Board and the NZ Transport Agency have worked together to produce a Regional Dust from Unsealed Road Mitigation Framework. A non-statutory document has no legal weight, as such implementing the strategy has been at the discretion of district councils. This s32 looks at a possible regulatory approach through the regional plan.

This approach is expected to be more efficient than a purely regulatory approach. Whereas a collaborative approach means that councils can share resources and coordinate efforts, a regulatory approach would likely undermine this working relationship. It would also create a number of problems in terms of the enforceability of any rule and the ability of district councils (and road users) to comply with any rule. It may also delay the work that is taking place through the dust mitigation framework if appeals are launched to test the legality of any rule and work is put on hold until there is certainty on what resources district councils will need to put in place to comply with a rule. This is combined with the process and information costs of a consent (if applied for) which may divert resources away from actually addressing the issue. A permitted rule with a requirement for a current programme to be in place to address dust treatment of priority sites reflects best practice and is necessary for a collaborative approach to be successful. The requirement does not fetter the ability for district councils to plan and prioritise mitigation, rather it stipulates a requirement to have a programme in place.

The preferred management Option is B, the 'enhanced status quo', as it sets out a clear position. Although it would be explicitly made a permitted activity, dust management would still be addressed through council monitoring and joint work on the dust mitigation framework. To date this process is beginning to bear fruit as sealing treatments have been put in place at some of the worst affected sites and ongoing programmes are in place to seal other areas over the next 3-5 years.

The below table details Option B:

Dust from unsealed roads	Key policy approach
Permitted subject to a dust treatment prioritisation programme being in place	None

Other options considered but discarded include:

Option A - the status quo . The status quo is a reasonable option however creates uncertainty from an enforcement perspective. This is because it is proposed to include a rule that permits air discharges from any place or other source under RMA S15 (2A), subject to no 'offensive or objectionable'effects across the boundary, However given the unique nature of the discharge of dust from unsealed roads and the difficulty in excluding all 'offensive and objectionable effects' from this activity , we would need to exclude this from consideration under this catch-all rule. Costs and flexibility would therefore remain unchanged but so would the number of incidents of dust nuisance.

Option C 'no offensive and objectionable effects from unsealed road generated dust', although simple to understand from an effects point of view is subjective and district councils will not be able to prioritise efforts. It will likely lead to the district councils seeking a global consent to operate their unsealed road network. This is because there are likely to be a number of sites which fail this standard and it will be impossible to mitigate dust at all of them. The consent process and eventual outcome are likely to be drawn-out and expensive with probable legal appeals and challenge to the rule. In reality, it is unlikely the regional council will outright refuse consent for the operation of the districts' road network because of the economic and social effects of doing so. Again there is also the question over enforcement – who is responsible for complying with the conditions of a rule or a consent, the road owner (district council) or road user (logging trucks, dairy companies, private vehicles)?

Option D, a quantitative criteria-based approach, is potentially much more complex than Option B but will allow the majority of unsealed roads to operate as permitted activities. The worst affected areas (greatest number of logging trucks plus largest number of houses by the road plus greatest number of exceedances of PM_{10} plus greatest number of vehicles/heavy vehicles) would likely not comply with the rule and would therefore require sealing treatment. It is possible such an approach may lead to some 'technical' rule breaches (based on the proposed criteria) even where the overall adverse effects are limited. These technical breaches may lead to a greater number of incidents being recorded.

It is questionable as to how necessary Option D is. As stated above, most district councils have dust mitigation programmes in place and they are starting to deliver sealing treatment (or dust suppressants) in affected areas. In order to meet the conditions of the rule, district councils may indeed have to accelerate already planned sealing programmes for these (and other) areas or they may decide to apply for a consent to operate the road. While accelerating planned sealing is a possible

outcome it is possible that the rule will be challenged and/or a consent applied for to operate the road with dust effects. As already described it may delay the work that is taking place through the dust mitigation framework if appeals are launched to test the legality of any rule and work is put on hold until there is certainty on what resources district councils will need to put in place to comply with a rule.

7.6.2 Relevant provisions

This evaluation supports the following Regional Plan provisions:

- Rule C.7.2.1 - Wet abrasive blasting – permitted activity
- Rule C.7.2.2 - Dry abrasive blasting within an enclosed booth – permitted activity
- Rule C.7.2.4 - Discharges to air from industrial and trade activities – permitted activity
- Rule C.7.2.5 - Discharges to air from the use of public roads by motor vehicles - permitted activity
- Rule C.7.2.6 - Discharges to air not specifically regulated in the plan – permitted activity
- Rule C.7.2.7 - Discharge into air not a permitted, controlled, restricted discretionary, non-complying or prohibited activity - discretionary activity
- Policy D.3.1 - General approach to managing air quality
- Policy D.3.3 - Dust and odour generating activities

7.6.3 The problem, opportunity and/or requirement

Dust from activities in general

Dust can come from a number of sources including quarrying operations, earthworks, the use of vehicles on unsealed surfaces, abrasive blasting and the loading, unloading and application of various materials (for example, sand, cement clinker, and fertilisers).

Abrasive blasting produces dust at higher rates than other activities (particularly dry abrasive blasting). The long-term inhalation of dust from abrasives containing high free silica may cause silicosis, a lung disease. Dust from abrasive blasting is also likely to be contaminated with the material that is removed from the object being blasted. It may contain heavy metals or other contaminants which, when deposited in water, can accumulate in sediments causing adverse effects on aquatic life.

As such, the activity is tightly controlled in the Regional Air Quality Plan. The RAQP controls range from being a controlled activity (if undertaken in a spray booth) right up to being prohibited, if done in the open where it is of a size where it can be placed in a booth. Currently there are 22 consents active for dry abrasive blasting activities. Four are exclusively in blasting booths. All others are a combination of either being in a booth, taking place at a fixed site out in the open or being mobile operations.

Booth blasting can generally internalise adverse effects to the extent that the activity could be permitted. Open air blasting has the potential to cause greater effects, however, improvements to minimise these effects (including the use of low dust alternatives) that suggest a prohibited status is no longer necessary.

Dust from earthworks and quarrying activities are currently permitted, subject to the person undertaking the activity avoiding offensive and objectionable cross-boundary effects. The rules for these activities are generally appropriate with few problems reported.

Dust from unsealed roads

There is currently no management of dust from unsealed public roads in regional plans – this is therefore a permitted activity under s15(2A) RMA not subject to any performance standards. The issue of dust from public roads has been of considerable public interest recently.

Approximately 60% of Northland's 6530 kilometres of roads are unsealed (these are all local roads - i.e. they are maintained by local authorities). As the movement of traffic, particularly heavy traffic, along unsealed roads takes place, large plumes of dust can be thrown up in dry conditions. The effects of the dust can include:

- The larger dust particles (greater than PM_{10}) can coat crops, smother native vegetation and contaminate sources of drinking water;
- Smaller dust particles (less than PM_{10}) can travel deep into the respiratory tract of humans and animals and exacerbate underlying chronic respiratory and cardiac health problems (for example, asthma); and
- Social and economic effects from being unable to enjoy outdoor living space and limiting outdoor activities.

The National Environmental Standards (2011) set bottom lines for the control of air quality emissions. Particulate matter (PM_{10}), the standard that most relates to dust, is set at no more than one exceedance of 50µg/m_3 in any 24 hour period over one year. The NES however is ill-suited in application to the issue of dust on roads, being more a measurement of ambient air quality across larger geographies than the acute spikes in dust experienced at the roadside. There is however no case law on this issue so this is somewhat a grey area. Operationally speaking, the regional council has chosen not to apply the NES to the management of this issue for these two reasons.

Role of the Regional Council in managing dust from unsealed roads

Regional councils have a role in controlling the discharges of contaminants to air (under Section 30 RMA) and a duty to monitor the state of the environment under Section 35 RMA. As the council has received a number of complaints of dust nuisance from residents living beside unsealed roads, the regional council undertook monitoring (using an E-BAM monitoring device) at four of potentially the worst affected sites in Northland.

A summer monitoring programme in 2013 at Wright Road, Opouteke Road, Pipiwai Road and Ngapipito Road found elevated levels of PM_{10} (above the standard of 50µg/m^3) on eight occasions on Ngapipito Road and one occasion on Opouteke Rd. The results were collated only using data which was considered to be 100% valid data. This is where data was measured by the E-BAM continuously at 10 minute intervals throughout a calendar day from midnight to midnight. The highest result recorded was at Ngapipito Rd with a result of 112µg/m^3 and an hourly peak of 410µg/m^3 (Opouteke Rd had a highly hourly peak at 620µg/m3).

In the summer of 2014/2015 council repeated the exercise at two other roadside sites (Matawaia-Maromaku Rd, and Pungaere Rd) as well as repeat monitoring at Opouteke Rd. Both the Matawaia-Maromaku Rd and Pungaere Rd sites were found to be in exceedance of the standard of 50µg/m3 on one occasion.

The most recent monitoring took place in summer 2016 and found exceedances at Wright Road (where recent sealing has taken place) as well as Kohumaru Road and Omahuta Road.

Site	Early 2013 Number exceedances (days 100% valid data)	2014/15 Number exceedances (days 100% valid data)	2015/16 Number exceedances (days 100% valid data)
Wright Road	0 (3)	-	7 (unsealed road site) 11 (sealed road site) (26 days valid data for both sites) Note: this data needs to be reviewed to understand this unexpected result
Opouteke Road	1 (1)	0 (17)	-
Pipiwai Road	0 (7)	-	-

Site	Early 2013 Number exceedances (days 100% valid data)	2014/15 Number exceedances (days 100% valid data)	2015/16 Number exceedances (days 100% valid data)
Ngapipito Road	8 (10)	-	-
Matawaia-Maromaku Road	-	1 (8)	-
Pungaere Road	-	0 (10) (one result was at 50 µg/m^3)	-
Rawhiti Road	-	-	0 (9)
Takou Bay	-	-	0 (12)
Snooks Road	-	-	0 (6)
Te Maire Road	-	-	0 (14)
Jubilee Road	-	-	0 (9)
Kohumaru Road	-	-	1 (9)
Omahuta Road	-	-	1 (13)

Public concern on this issue has increased as Northland has experienced an increase in the amount of forestry ready for harvest. The movement of logging trucks greatly exacerbates the disturbance of dust into the air as does prolonged periods of dry weather (as was experienced in 2013).

Beyond monitoring, it is possible for the regional council to regulate dust emissions from unsealed roads through a rule in the regional plan (under functions available in Section 30 RMA to control discharges to air).

There are significant challenges for any approach to manage dust through a regulatory approach:

1) Regulation in itself does not resolve the dust problem. The main issue is the availability of funding (see below). The effect of regulation may actually increase costs as District Councils may chose to apply for a consent to operate a road where dust is created. There are process costs to this (the cost of applying for a consent, hearings) as well as information requirements accompanying an assessment of effects with a consent. A rule is likely to be legally challenged and possibly divert resources away from existing sealing treatment programmes, or at least delay these programmes, if there is uncertainty as to the scope of where the rule will apply.
2) There is limited funding to address the cost of sealing affected roads given the scale of the problem and the length of the unsealed roading network in Northland. There is now no national funding available for tar seal treatment (the most effective treatment of dust). The NZ Transport Agency has made clear that 100m dust seals are not funded, although applying dust suppressants can be funded out of existing maintenance budgets, keeping in mind that no additional funding will be made available. The cost of a dust mitigation tar seal treatment (over 100m) is between $30,000 and $40,000 whilst the application of dust suppressant over 100m is between $2000 and $2500 per application. District Councils have a duty (under S10 of the Local Government Act 2002) to '*meet the current and future needs of communities for good-quality local infrastructure, local public services, and performance of regulatory functions in a way that is most cost-effective for households and*

businesses'. The effect of this is that the requirement to mitigate dust under the RMA must be balanced against a need to ensure that district councils have the discretion to use funding in a way that is cost-effective, addresses the areas worse effected by dust and does not restrict the ability of district council to fund activities that benefit the wider community.

3) Any restrictions on the use of heavy vehicles on roads as an alternative to dust treatment has to be balanced against lost time, increased fuel costs and associated economic effects that may occur.
4) The enforceability of any regulation if a rule is breached and whether liability falls on the road owner or road user is a key issue. This issue again adds complexity, uncertainty and cost to any rule based approach.

Whilst regulation may be problematic, the regional council's ability to undertake roadside monitoring means that it has the ability to be able to build up a picture over time of where the problem is occurring and offer technical advice to district councils. In recent years this arrangement has become more formalised as Northland's councils, Northland District Health Board and the NZ Transport Agency have worked together to produce a Regional Dust from Unsealed Road Mitigation Framework. The framework prioritises intervention on the heaviest trafficked unsealed roads, subject to resources being available. The regional council will monitor dust from the source, the district health board will provide technical advice on health effects and the district councils and NZ Transport Agency will implement a toolkit to mitigate dust.

Since this framework has been adopted, at least two district councils have developed prioritised sealing programmes based on the areas of greatest need. Far North District Council sealed several sections of road in 2014. This has included: Piccadilly Rd with 1240m of road sealed in three sections and Pipiwai Rd, with 1786m of road sealed. Diggers Valley Rd had 2km of dust suppressant was trialled in 2015. Forestry firms have contributed to funding the sealing works.

Whangarei District Council has allocated $400,000 between 2015/16-2017/2018 for sealing 100m strips along property frontages. An application for funding from the National Land Transport Fund was declined by NZ Transport Agency in 2015. Since the work is expected to cost $532,000, the council will ask logging and trucking industries to make up the $132,000 shortfall. The work is initially targeted at Wrights and McCardle roads.

This multi-agency approach recognises the unique challenges of this issue and recognises that the regional council's role is better served in a monitoring and advisory capacity, helping district councils to prioritise their sealing/dust suppressant work to the worst affected areas. It is noted that a regulatory approach may jeopardise this working relationship as the regional council would act as a 'regulator' first rather than a partner providing scientific advice. This being said, as a minimum, the regional council would expect each district council to have a programme in place that sets out priority sites for dust treatment that are identified through monitoring.

Feedback on Draft Regional Plan - September 2016

There was minimal feedback on the issue of dust from unsealed roads. One submitter was opposed to any regulation by Council whilst another stated that a dust management policy be developed to address road dust.

7.6.4 Management options

Dust management options (abrasive blasting)

This section summarises the management options for abrasive blasting. The intention is not to identify every different combination of approach, as there would be many, but to represent the range of options and highlight key differences in approaches.

The key differences between the options focus on the extent to which dry abrasive blasting is permitted.

Option A: status quo

Overview: this option essentially roles over the existing approach in the Regional Air Quality Plan:

Background: as above – these are the existing rules.

Blasting booth	Outdoor – cannot fit in booth (includes mobile blasting of fixed objects, e.g. bridges)	Outdoor but could fit in booth
Controlled	Discretionary	Prohibited

Option B: permissive approach

Overview: this approach would see any blasting taking place within blasting booths a permitted activity. Outdoor blasting would remain discretionary and there would be no prohibited activity standard.

Background: this approach is consistent with that taken in other regions. If the activity is contained in a building with adequate control on emissions then there is little likelihood of cross-boundary effect or damaging discharges to the environment.

Blasting booth	Outdoor – cannot fit in booth (includes mobile blasting)	Outdoor can fit in booth
Permitted	Discretionary	Discretionary

Option C: minimum controls

Overview: this enables dry abrasive blasting anywhere, subject to performance standards.

Background: this approach goes further than the more permissive approach found in other regions.

Blasting booth	Outdoor – cannot fit in booth (includes mobile blasting)	Outdoor can fit in booth
Permitted	Permitted	Permitted

Dust management options (dust from unsealed roads)

This section summarises the management options for controlling discharges of dust from unsealed roads. The intention is not to identify every different combination of approach as there would be many, but to represent the range of options and highlight key differences in approaches.

The options focus on a regulatory (and one non regulatory) approach.

- Status quo – non regulatory approach with councils working together through the dust mitigation framework.
- Enhanced status quo - specifically permit discharge of dust from unsealed roads, subject to a dust treatment prioritisation programme being in place.
- Qualitative based standard – no objectionable or offensive effects
- Quantitative based standard – using a criteria based approach.

Option A: status quo

Overview:

- No rules in the plan (default to Section 15 (2) RMA); and
- Continue to rely on the Regional Dust Mitigation Framework – (regional council's role is monitoring roadside dust at 'problem' sites in the summer period. Data to be used to inform a sealing programme developed by district councils).

Background: this option is the absence of rules in the regional plan. Dust from public roads is effectively permitted. This approach equates to the 'do nothing' approach only from a regulatory perspective but not from a non-regulatory perspective. The regional council will prioritise monitoring and technical assistance and work collaboratively with other councils through the dust mitigation framework.

As stated, the National Environmental Standards (2011) set bottom lines for the control of air quality emissions, however is problematic in its application to the matter of dust from unsealed roads. Operationally speaking, the regional council has chosen not to apply the NES to the management of this issue. With the status quo option, this is likely to continue. The regional council could in theory still choose at any time to use Section 17 RMA to serve an abatement notice on either the generator of the dust (heavy vehicles) or the owner of the road (the district council).

Dust from unsealed roads	Key policy approach
Deemed permitted (no conditions)	None

Option B: enhanced status quo

Overview: Specifically permit discharge of dust from unsealed roads, subject to a dust treatment prioritisation programme being in place.

Background: this option build on the status quo - Council will continue to pursue non-regulatory methods, including monitoring. The option will permit discharges from unsealed roads but district councils need to ensure they have an up-to-date programme in place identifying priority sites for dust treatment.

Dust from unsealed roads	Key policy approach
Permitted subject to a dust treatment prioritisation programme being in place	None

Option C: qualitative-based standard (no offensive and objectionable effects)

Overview: permitted activity subject to no offensive and objectionable effects across the road boundary on to neighbouring properties.

Background: rule in the plan that requires dust on roads to be avoided, remedied or mitigated so that there are no 'objectionable or offensive effects'. This terminology is common in regional plans across the country, has been tested by case law, and rather than setting a numeric threshold, it allows the degree of effect to be assessed by an enforcement officer on a case-by-case basis.

Dust from unsealed roads	Key policy approach
Permitted activity subject to no offensive and objectionable effects across the road boundary on to neighbouring properties. If the permitted rule cannot be met, then the activity is a restricted discretionary activity.	Policy would require avoiding, remedying or mitigating effects to ensure that there are no offensive or objectionable cross-boundary effects.

Option D: quantitative-based standard

Overview: construct a rule that repeats the national environmental standard for air quality (no more than one exceedance per year, 50µg/m_3 for PM_{10} in a 24 hour average). The rule would potentially be based on a criteria that uses proximity to and number of sensitive areas, number of vehicles and heavy vehicles and number of exceedances of PM_{10}. These criteria are commonly used by district councils to prioritise road sealing treatment.

Background: the rationale for this rule is to use a numeric standard that is objective and prioritises dust mitigation efforts to the worst affected roads.

Dust from unsealed roads	Key policy approach
Permitted activity if meets the criteria threshold. If the road exceeds the criteria threshold then the activity becomes a restricted discretionary activity.	Policy would require a plan be submitted with any consent to minimise dust to acceptable levels.

7.6.5 High level objectives, measures and information sources

Section 32 requires an assessment of "*...the efficiency and effectiveness of the provisions in achieving the objectives...*". Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section 1.6 'Evaluation approach' for more details.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. They signal a direction for where we want to head, without stating how far we go – that comes later (they are the beginnings of objectives).

Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against.

Dry abrasive blasting

High level objective	Measure
Minimise the adverse effects of dust on people and the environment.	1 = significantly more incidents. 2 = moderately more incidents. 3 = slightly more incidents. 4 = same number of incidents. 5 = slightly fewer incidents. 6 = moderately fewer incidents. 7 = significantly fewer incidents. 8 = no incidents.
Minimise costs and bureaucracy to those carrying out the activity.	1 = significantly more cost/hassle. 2 = moderately more than currently cost/hassle. 3 = slightly more than currently cost/hassle. 4 = same as currently. 5 = slightly less than currently cost/hassle. 6 = moderately less cost/hassle. 7 = significantly less cost/hassle. 8 = no cost/hassle – no restrictions on what people can do.

Explanation for the high level objectives and measures

Section 32 requires an assessment of the impacts on economic growth and employment opportunities (s32(2)(A)). However, the impact of the options on these is imperceivable and/or can't be determined with any confidence. Therefore, economic growth and employment opportunities have not been included as high level objectives. For more information go to the section '1.7 'Assessing impacts on economic growth and employment opportunities'' (which is in the Introduction section).

Minimise the adverse effects of dust on people and the environment.

There are generally around five complaints/incidents a year from dry abrasive blasting. This generally relates to blasting in the open, not booth blasting. Dry abrasive blasting does have the potential to cause significant health effects with prolonged exposure however (as detailed in the problem, opportunity and/or requirement section). Environmental effects can include contamination of land and water from the blasting medium and/or contaminants from the surface to which the blasting is being applied.

Minimise costs and bureaucracy to those carrying out the activity.

Compliance costs include the cost of having to get a consent and then any ongoing monitoring fee associated with the consent. Having to get a consent and then pay an annual monitoring fee is a cost, albeit a minor one, when compared with the other costs of running a business. Nevertheless, it is still beneficial to consider how changes to rules will impact on the costs of complying with regulation for business. The costs of a consent are:

- $3144 – limited notified/notified discharge consent.
- $838 – non notified discharge consent.

In nearly all cases the consent will be non-notified. What's more, if the resource consent is a renewal of an existing consent then the charge is $734.

Clearly, in the absence of any rules there will be no requirement to pay any charges. In the case of booth blasting there will still be a minimum requirement that they have to properly filter out dust from the extraction system. This will be the main 'hassle' that blasters will have to meet. Most blasters already have to do this as part of any consent so removing the consent fee will be a saving of $734 plus the annual monitoring fee.

Dust from unsealed roads

High level objective	Measure
Minimise the adverse effects (including health effects) of dust on people and the environment.	1 = significantly more incidents. 2 = moderately more incidents. 3 = slightly more incidents. 4 = same number of incidents. 5 = slightly fewer incidents. 6 = moderately fewer incidents. 7 = significantly fewer incidents. 8 = no incidents.
Minimise compliance and other costs for road users and councils .	1 = significantly more cost/hassle. 2 = moderately more than currently cost/hassle. 3 = slightly more than currently cost/hassle.

High level objective	Measure
	4 = same as currently. 5 = slightly less than currently cost/hassle. 6 = moderately less cost/hassle. 7 = significantly less cost/hassle. 8 = no cost/hassle – no restrictions on what people can do.
Maximise discretion/flexibility of district councils to plan and prioritise mitigation for road dust.	1 = no discretion. 2 = significantly less discretion. 3 = moderately less discretion. 4 = slightly less discretion. 5 = same as currently. 6 = slightly more discretion. 7 = moderately more discretion. 8 = significantly more discretion.

Explanation for the high level objectives and measures

Section 32 requires an assessment of the impacts on economic growth and employment opportunities (s32(2)(A)). However, the impact of the options on these is imperceivable and/or can't be determined with any confidence. Therefore, economic growth and employment opportunities have not been included as high level objectives. For more information go to the section '1.7 'Assessing impacts on economic growth and employment opportunities'' (which is in the Introduction section).

Minimise the adverse effects (including health effects) of dust on people and the environment.

Dust from unsealed roads can cause adverse effects to people living close to the roadside (through, for example, health and nuisance effects) and it is appropriate to consider minimising these effects as a high level objective. The actual adverse effects of dust from unsealed roads varies significantly both in time and location and are therefore difficult to quantify, we have therefore proposed to use the expected change in the number of incidents as a measure.

Council receives at least 5-10 complaints a year (it is important to note also that district councils receive complaints as well) as well as petitions and emails complaining about dust and requiring monitoring and road sealing be undertaken. As a result of the continuing dust nuisance, council has, for the last three years, undertaken a summer monitoring programme of roadside dust nuisance. The 2016 summer monitoring programme was the largest involving nine sites. As already discussed (under the 'problem, opportunity and/or the requirement') there were occasions when dust exceeded the national standard of 50µg/m3 at some localities.

Information for this measure comes from the regional council in terms of environmental incidents generated. Use of 'exceedances' of PM^{10} was considered as a measure however incidents recorded was deemed a better measure of the qualitative (how it affects people's quality of life) effects of dust rather than simply the quantitative effects (which is what our monitoring detects). Note that incidents could include non-compliance with a rule where there is no actual environmental effects (a technical rule breach).

Minimise compliance and other costs for road users and councils.

It is important to consider the effects any rule change will have on the costs to resource users, district councils to comply and the regional council to monitor dust and enforce compliance with a rule.

As the activity is currently considered effectively permitted, a new permitted rule with conditions and/or a consent is likely to add cost to those carrying out the dust creating activity (the road user) and/or the owner of the road (the district council).

If district councils sought to comply a permitted rule, mitigation options (and costs) available might include:

- Dust mitigation tar seal. Costed at 100 metres – between $30,000 and $40,000.
- Dust suppressant. Costed at 100 metres – between $2000 and $2500 per application.
- Restrict use of heavy vehicles on road – lost time, increased fuel cost and associated economic effects.

In addition, these costs all represent opportunity costs. Opportunity costs are the costs that are lost when pursuing the most favoured option over the next most favoured option. Opportunity costs arise here because the district council may have to re-prioritise work away from activities that would otherwise have a higher benefit-cost ratio for the community (see below). Opportunity costs may also arise for certain road users. Any rule restricting the movement of heavy good vehicles for example are likely to have significant opportunity costs for this road user. This might include the need to avoid certain roads, take more indirect routes (with added fuel costs and travel times) or a downgrading of forestry activities in an area.

An alternative available to a district council is to apply for a consent (which may be a global consent) to operate roads in exceedance of the conditions of the permitted rule. Assuming the consent is notified, baseline costs will be the $3144 lodgement fee but there is likely to be a great deal of work needed to support the consent as well as potential hearing and appeal costs.

Costs for the regional council are related to increased monitoring to ensure compliance with a rule.

In 2016, the costs and equipment of monitoring were as follows:

- Two monitoring officers to deploy and decommission the instrument from/to each site.
- 300 hours of staff time.
- A laptop to download the data collected.
- Tool box and appropriate tools.
- Personal protective equipment.
- Vehicle.
- Use of the monitoring equipment and power, costed at approximately $5 per day.

In addition, an additional E-BAM continuous monitoring instrument has been purchased at a one off cost of $22,000.

Information on this measure comes from annual plans and roading activity plans as well as consent costs recorded by the regional council and costs of monitoring and enforcement.

Maximise discretion/flexibility of district councils to plan and prioritise mitigation for road dust.

District councils, as road controlling authorities, manage their own budgets for road maintenance and plan and prioritise as needed. New rules and regulations may however (indirectly) cause a re-prioritisation of resources away from planned work in order to comply with a regulatory requirement to mitigate dust (which may not reflect the scale or severity of adverse effects, . Information on this measure comes from feedback from district council.

7.6.6 Evaluating the management options

Management options for dry abrasive blasting.

High level objective and measure	Option A – status quo	Option B– permissive approach	Option C – minimal approach
Minimise the adverse effects (including health effects) of dust on people and the environment.	4 = same number of incidents.	4 = same number of incidents.	2 = moderately more incidents.

High level objective and measure	Option A – status quo	Option B– permissive approach	Option C – minimal approach
Measure: *number of incidents.*			
Minimise costs and bureaucracy to those carrying out the activity. *Measure:* *cost/hassle to those carrying out the activity.*	4 = same cost/hassle.	5 = sightly less cost/hassle.	6 = moderately less cost/hassle.

Certainty about the evaluation

There is always uncertainty about the potential impacts of management options. We're moderately confident about the accuracy of the evaluation for these three options.

Time-frame of the evaluation

The evaluation is made over the life-time of the plan (10-15 years).

The preferred management option

The preferred management option for the Regional Plan is Option B: permissive which enables booth blasting to take place as a permitted activity. The reason for this is that it is unlikely the number of complaints we get will change if booth blasting is permitted – we get few anyway and rarely from blasting booths. Outdoor blasting, which is much more likely to give rise to effects, will be a discretionary activity (rather than a discretionary or prohibited activity under current rules). Emission control standards will in any case be retained for booth blasting in the form of a permitted activity, which will protect amenity while avoiding the need for a consent.

Option A, which is the status quo, is discounted because under this option booth blasters still require a consent for no real benefit. Option C is discounted because outdoor blasting needs more control than booth blasting, can by definition occur anywhere, and making it a permitted activity will make it harder to control effects on nearby sensitive areas.

Management options for dust on roads.

High level objective and measure	Option A – status quo	Option B - enhanced status quo	C – qualitative approach (no offensive/ objectionable effects)	D – quantitative approach (rules based on criteria and monitoring)
Minimise the adverse effects (including health effects) of dust on people and the environment. *Measure:*	4 = same number of incidents.	5 = slightly fewer incidents.	5 = slightly fewer incidents.	3 = slightly more incidents.

High level objective and measure	Option A – status quo	Option B - enhanced status quo	C – qualitative approach (no offensive/ objectionable effects)	D – quantitative approach (rules based on criteria and monitoring)
Minimise compliance and other costs for road users and councils. *Measure:* *cost/hassle*	4 = same as currently.	3= slightly more cost/hassle	1 = significantly more cost/hassle (possibly 2 = moderately more cost/hassle if district councils seek a consent).	2 = moderately more cost/hassle.
Maximise discretion/flexibility of district councils to plan and prioritise mitigation for road dust. *Measure:* *amount of discretion and flexibility.*	5 = same as currently.	4 = slightly less discretion.	2 = significantly less discretion.	3 = moderately less discretion.

Certainty about the evaluation

There is always uncertainty about the potential impacts of management options. We're only slightly confident about the accuracy of the evaluation for these three options. This is because the introduction of any rule under the RMA would be untried/untested in New Zealand. If we were to include a rule, a peer/legal review of the provision and this accompanying s32 is likely to be necessary.

Time-frame of the evaluation

The evaluation is made over the life-time of the plan (10-15 years).

The preferred management option

The preferred management Option is B, the 'enhanced status quo' as it sets out a clear position. Although a permitted activity, dust management would still be addressed through council monitoring and joint work on the dust mitigation framework. To date this process is beginning to bear fruit as sealing treatments have been put in place at some of the worst affected sites and ongoing programmes are in place to seal other areas over the next 3-5 years.

This approach is expected to be more efficient than a purely regulatory approach. Whereas a collaborative approach means that councils can share resources and coordinate efforts, a regulatory approach would likely undermine this working relationship. It would also create a number of problems in terms of the enforceability of any rule and the ability of district councils (and road users) to comply with any rule. It may also delay the work that is taking place through the dust mitigation framework if appeals are launched to test the legality of any rule and work is put on hold until there is certainty on what resources district councils will need to put in place to comply with a rule. This is combined with the process and information costs of a consent (if applied for) which may divert resources away from actually addressing the issue. A permitted rule with a requirement for a current programme to be in place to address dust treatment of priority sites reflects best practice and is necessary for a collaborative approach to be successful. The requirement does not fetter the ability for district councils to plan and prioritise mitigation, rather it stipulates a requirement to have a programme in place.

Option A - the status quo . The status quo is a reasonable option however creates uncertainty from an enforcement perspective. This is because it is proposed to include a rule that permits air discharges from any place or other source under RMA S15 (2A), subject to no 'offensive or objectionable'effects across the boundary, However given the unique nature of the discharge

of dust from unsealed roads and the difficulty in excluding all 'offensive and objectionable effects' from this activity , we would need to exclude this from consideration under this catch-all rule. Costs and flexibility would therefore remain unchanged but so would the number of incidents of dust nuisance.

Option C 'no offensive and objectionable effects from unsealed road generated dust', although simple to understand from an effects point of view is subjective and district councils will not be able to prioritise efforts. It will likely lead to the district councils seeking a global consent to operate their unsealed road network. This is because there are likely to be a number of sites which fail this standard and it will be impossible to mitigate dust at all of them. The consent process and eventual outcome are likely to be drawn-out and expensive with probable legal appeals and challenge to the rule. In reality, it is unlikely the regional council will outright refuse consent for the operation of the districts' road network because of the economic and social effects of doing so. Again there is also the question over enforcement – who is responsible for complying with the conditions of a rule or a consent, the road owner (district council) or road user (logging trucks, dairy companies, private vehicles)?

Option D, a quantitative criteria-based approach, is potentially much more complex than Option B but will allow the majority of unsealed roads to operate as permitted activities. The worst affected areas (greatest number of logging trucks plus largest number of houses by the road plus greatest number of exceedances of PM_{10} plus greatest number of vehicles/heavy vehicles) would likely not comply with the rule and would therefore require sealing treatment. It is possible such an approach may lead to some 'technical' rule breaches (based on the proposed criteria) even where the overall adverse effects are limited. These technical breaches may lead to a greater number of incidents being recorded.

It is questionable as to how necessary Option D is. As stated above, most district councils have dust mitigation programmes in place and they are starting to deliver sealing treatment (or dust suppressants) in affected areas. In order to meet the conditions of the rule, district councils may indeed have to accelerate already planned sealing programmes for these (and other) areas or they may decide to apply for a consent to operate the road. While accelerating planned sealing is a possible outcome it is possible that the rule will be challenged and/or a consent applied for to operate the road with dust effects. As already described it may delay the work that is taking place through the dust mitigation framework if appeals are launched to test the legality of any rule and work is put on hold until there is certainty on what resources district councils will need to put in place to comply with a rule.

8 Coastal

8.1 Legal background

Resource Management Act 1991 (including regulations)

Part 1 - Interpretation and application

The Resource Management Act 1991 (RMA) defines the 'coastal marine area' as the foreshore, seabed, and coastal water, and the air space above the water between:

- a seaward boundary (territorial sea limit, which is presently 12 nautical miles offshore), and
- a landward boundary (the line of Mean High Water Springs), except where that line crosses a river, the landward boundary at that point shall be the lesser of 1 kilometre upstream from the mouth of the river or the point upstream that is calculated by multiplying the width of the river mouth by 5.

The term 'coastal environment' is not defined in the RMA but the New Zealand Coastal Policy Statement 2010 sets out (in Policy 1) what the extent and characteristics of the coastal environment include, recognising that the 'coastal environment' will vary from region to region and locality to locality.

The RMA defines 'occupy' as the activity of occupying any part of the coastal marine area –

(a) where the occupation is reasonably necessary for another activity; and

(b) where it is to the exclusion of all or any class of persons who are not expressly allowed to occupy that part of the coastal marine area by a rule in a regional coastal plan and in any relevant proposed regional coastal plan or by a resource consent; and

(c) for a period of time and in a way that, but for a rule in the regional coastal plan and in any relevant proposed regional coastal plan or the holding of a resource consent under this Act, a lease or licence to occupy that part of the coastal marine area would be necessary to give effect to the exclusion of other persons, whether in a physical or legal sense.

Part 2 - Purpose and principles

Part II of the RMA (sections 5-8) sets out the purpose of the Act and principles which are to be applied in resource management decision-making.

Part 3 - Duties and restrictions under this Act

Section 12 sets out 'Restrictions on use of coastal marine area'. Unlike land where the general presumption is that people can do what they want unless a rule in a regional/district plan says otherwise, the opposite applies in the coastal marine area. The general presumption is that you need a resource consent (coastal permit) to do anything (such as the placement of a structure, the disturbance of foreshore or seabed or reclaiming or draining the foreshore) unless expressly allowed by a National Environmental Standard (NES), a rule in a Regional Coastal Plan (coastal plan) or a resource consent. This is because the coastal marine area is generally perceived as public space or 'commons' and private occupation and use is treated as a privilege rather than a right.

Section 12 of the RMA requires people to gain a consent under section 12(1)(b) (for the erection or placement of structures) and if they wish to occupy it exclusively, a further consent to occupy under 12(2)(a). The term 'structure' is defined in the RMA as meaning "*any building, equipment, devise, or other facility made by people and which is fixed to land; and includes any raft*". Within the coastal marine area, being 'fixed to land' means fixed to the foreshore and/or seabed.

Part 4 - Functions, powers and duties of central and local government

Regional coastal plans (which are the only mandatory regional plans under the RMA) control activities that councils manage under the RMA from the line of mean high water springs out to the 12 nautical mile limit of the territorial sea. These plans are very important because, as mentioned above, people are restricted from undertaking many activities in the coastal marine

area unless expressly allowed by a regional coastal plan or a resource consent. As well as rules, councils use a range of non-statutory mechanisms to achieve the sustainable management of the coastal environment (such as financial incentives, education, advocacy and coordination with volunteer groups).

The functions of regional councils are described in section 30, and include:

- The establishment, implementation and review of objectives, policies and methods to achieve integrated management of the natural and physical resources of the region; and
- In respect of any coastal marine area in the region, the control (in conjunction with the Minister of Conservation) of: land and associated natural and physical resources, the occupation of space, the dumping and incineration of waster or other matter, the mitigation of the effects of noise and activities in relation to the surface of water; and
- If appropriate, the estabishment of a rule in a regional coastal plan to allocate space in the coastal marine area under Part 7A of the RMA.

Part 5 - Standards, policy statements and plans

Regional coastal plans - Section 63(2) provides that without limiting subsection (1) the purpose of regional coastal plans is to assist a regional council, in conjunction with the Minister of Conservation, to achieve the purpose of the Act in relation to the coastal marine area.

Section 64 outlines that there shall be at all times, for all the coastal marine area of a region, one or more regional coastal plans. These plans are the only mandatory regional planning document – all others are discretionary. This illustrates the importance of sustainably managing the coast. Clause 19 of Schedule 1 requires the Minister of Conservation to approve a regional coastal plan – this is unique in that no other Minister has powers to amend or approve regional plans. Additionally, Clause 22 of Schedule 1 allows "any person" to request a regional council to change a regional coastal plan.

Under section 64A, in preparing or changing a regional coastal plan, regional councils are required to decide whether to impose coastal occupation charges. There is no obligation to impose charges and each regional council is required to make its own decision based on its unique circumstances. A decision on whether or not to impose a charging regime must be made by 1 October 2014 or within the next plan change after this date – section 401A(5).

Section 68: regional rules – this section sets out that regional councils may (for the purposes of carrying out their functions under the Act) include rules in regional plans.

Section 68A states that a regional coastal plan cannot authorise aquaculture activities in the coastal marine area as permitted activities.

The RMA does not authorise a regional plan to differentiate between individuals or groups. In particular, s68 does not contemplate the making of rules which would give preference to a particular sector or sectors of the community in the allocation of space in the coastal marine area.

If there is no relevant rule in the coastal plan for an activity and Part 3 (section 12 in particular) requires a resource consent to be obtained, section 87B of the RMA states that the activity must be treated as an application for a resource consent for a discretionary activity.

S107F – applications to undertake aquaculture activities: this section applies to an application for a coastal permit authorising aquaculture activities to be undertaken in the coastal marine area outside of designated aquaculture areas or areas that have a deemed coastal permit for aquaculture activities or a coastal permit for aquaculture activities.

S122 – consents not real or person property: this section outlines that no coastal permit shall be regarded as an authority for the holder to occupy any part of the coastal marine area to the exclusion of all or any class of persons.

Part 7A – Occupation of common marine and coastal area

This section relates to applications for, and the granting of, coastal permits to occupy space in the common marine and coastal area. The wider section contains provisions about managing occupation of the common marine and coastal area, in particular:

> *(a) a power to refuse to receive an application for a coastal permit to occupy the common marine and coastal area if made within 1 year after refusing a similar application*

(b) provisions about the contents of a regional coastal plan

(c) requirements for a regional council (before including a rule in a regional coastal plan or proposed regional coastal plan about the allocation of space in the common marine and coastal area) to have regard to, and be satisfied about, certain matters

(d) a power by Order in Council to direct a regional council not to proceed with the allocation of authorisations or to proceed as specified in the order

(e) a power of the Minister of Conservation to approve a method of allocating authorisations

(f) general provisions about authorisations

(g) a power of the Minister of Aquaculture, on request from a regional council, to suspend receipt of applications for coastal permits to occupy space in the common marine and coastal area for aquaculture activities or to direct a regional council to process and hear applications together.

Under the RMA, iwi authorities may prepare iwi planning documents to address coastal management issues. Councils must take into account any relevant planning document recognised by an iwi authority and lodged with the council, when preparing an RMA planning document.

Treaty settlements and statutory acknowledgements

Statutory acknowledgements

A statutory acknowledgement is a formal recognition by the Crown of the particular cultural, spiritual, historic, and traditional associations that an iwi has with a statutory area.

Statutory acknowledgements may apply to land, rivers, lakes, wetlands, landscape features or a particular part of the coastal marine area. Where a statutory acknowledgement relates to a river, lake, wetland or coastal area, the acknowledgement only applies to that part of the bed in Crown ownership or control.

The purpose of statutory acknowledgements is to:

1) Require consent authorities, the Environment Court and the Historic Places Trust to have regard to the statutory acknowledgements;
2) Require consent authorities to forward summaries of resource consent applications for activities that would affect the area to which the statutory acknowledgement applies to the governance entity; and
3) Enable the governance entity and any member of the relevant iwi to cite a statutory acknowledgement as evidence of the association of the iwi with the areas to which the statutory acknowledgement relates.

While the only legal requirements with regard to statutory acknowledgements in the preparation of plans and policy statements is to attach them to the relevant planning document, they provide a clear statement of the interests of tangata whenua that can be used to inform plan preparation.

For example, statutory acknowledgements can be used to:

- Create a starting point for consultation;
- Assist in drafting plan provisions;
- Identify activities/circumstances in which the iwi authority may consider waiving its right to receive summaries of applications, for example, where particular activities are not considered to affect the associations identified in the statutory acknowledgement;
- Using controlled, restricted discretionary and discretionary activity status where activities are likely to result in adverse effects on particular sites or issues of concern identified in the statutoryacknowledgement, which can include the requirement to obtain written approval from the claimant group; and
- Identify areas of importance to an iwi, or where consultation with iwi is to be encouraged through their incorporation into planning maps, or alert layers within GIS.

Treaty of Waitangi settlement legislation has been enacted for several iwi and hapū within Northland and is recognised in "Te Ture Whakamana nga Iwi o Taitokerau".

Iwi and hapū that have settlements containing statutory acknowledgments in Northland are:

- Te Uri o Hau
- Te Roroa
- Ngati Manuhiri
- Ngati Kuri
- Te Aupouri
- Ngai Takoto
- Te Rarawa.

More information about statutory acknowledgements in Northland can be found on the regional council's website.

Te Oneroa-a-Tōhe Beach Management Plan

The Te Hiku Iwi settlement created the Te Oneroa-a-Tōhe Board to manage the beach – a new permanent joint committee between Ngati Kuri, Te Aupōuri, Ngai Takoto and Te Rarawa, Northland regional and Far North District councils.

The board will provide governance and direction in order to promote the use, development and protection of the Te Oneroa-a-Tōhe-(Ninety Mile Beach) management area and its resources in a manner which ensures the environmental, economic, social, spiritual and cultural well-being for present and future generations. The board is responsible for developing a beach management plan. It will publicly notify the plan and seek submissions on it. The regional plan must 'recognise and provide' for the beach management plan once it is operative.

For more information refer to any of the settlement legislation for the iwi involved (the content on the beach management board in each act is identical).

Other laws

Marine and Coastal Area Act 2011

This Act replaced the Foreshore and Seabed Act 2004 and established a new regime for the recognition of Māori customary rights and title over the 'common marine and coastal area'. It includes the marine and coastal area, excluding freehold title and areas owned by the crown as conservation areas, national parks or reserves. The Act sets out that neither the Crown nor any other person can own, or is capable of owning, the common marine and coastal area.

S19 – Crown deemed to be owners of abandoned structures – if ownership of structures cannot be determined, the regional council must undertake an inquiry to determine the identity or whereabouts of the owner. If ownership cannot be established then the structure is deemed to be abandoned and the crown (Department of Conservation) is deemed to be the owner. This section also gives regional councils the ability to remove abandoned structures under s12(7) of the RMA.

Protected customary rights (for example, rights to launch waka or gather hangi stones) – a consent authority cannot grant a resource consent for an activity in a protected customary rights area if the activity will, or is likely to, have more than a minor adverse effect on the exercise of protected customary rights, unless the relevant group gives its written approval or the activity is exempted as an accommodated activity.

Customary marine title – this gives right-holders the ability to give or withhold permission to resource consent applications, protect wāhi tapu areas or create a planning document for the area.

If an iwi, hapū or whānau group has applied for, but not yet been granted, customary marine title over the relevant marine and coastal area, then a resource consent applicant will have to notify the group and seek the group's views before lodging the consent application.

If customary marine title has been recognised over the marine and coastal area, then, for most activities, a resource consent applicant will have to obtain permission from the group that holds customary marine title before a resource consent can begin. There is no right of appeal or objection to a refusal of permission (nor presumably to the conditions on which permission is granted).

Resource Management (Marine Pollution) Regulations 1998

The Resource Management (Marine Pollution) Regulations came into force on 20 August 1998 and were updated in 2002 and 2011. The Regulations control dumping and discharges from ships and off-shore installations in the coastal marine area. The Regulations deal with the dumping of waste and discharges from vessels including oil, garbage and sewage.

The regulations provide for regional councils to put rules in place that are more restrictive than the minimum standards for sewage discharges set in regulation 11 [(1)]. Regional Plans can not contain rules managing a discharge covered in regulations 9, 10, 12, 13, 14, 15. [(2)]

Reserves Act 1977

This Act offers tools to provide public access to and along the coast, including through mechanisms such as marginal strips and esplanade reserves, which can be required as part of a resource consent for subdivision. These are transferred to the territorial authority.

Local Government Act 2002

This Act gives councils the ability to set bylaws within their respective region or district. For example, section 145 gives authority to district councils to adopt bylaws to regulate activities which can be carried out on roads, in public places and in reserves. This provision enabled them to introduce the '*Vehicles on Beaches Bylaw 2009*', which is intended to regulate the use of vehicles on the district's beaches. The regional council's '*Navigation and Safety Bylaw 2012*' was also produced under this Act.

Maritime Transport Act 1994

This act includes powers for regional councils to make bylaws to regulate a number of activities that relate to the function of a regional coastal plan (Section 33M):

1) Regulate and control the use or management of ships;
2) Regulate the placing and maintenance of moorings and maritime facilities;
3) Prevent nuisances arising from the use of ships and seaplanes;
4) Prevent nuisances arising from the actions of persons and things on or in the water;
5) Reserve the use of any waters for specified persons, ships, or seaplanes;
6) In relation to boat races, swimming races, or similar events:
   a) prohibit or regulate the use of ships;
   b) regulate, or authorise the organisers of an event to regulate, the admission of persons to specified areas; and
7) Regulate and control the use of anchorages.

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1 *Regulation 11 (3) Resource Management (Marine Pollution) Regulations 1998.*
2 *Regulation 16 Resource Management (Marine Pollution) Regulations 1998.*

8.2 Planning documents

New Zealand Coastal Policy Statement 2010

A national policy statement is an instrument available under the RMA to help local government decide how competing national benefits and local costs should be balanced. The regional council is required to give effect to relevant provisions of national policy statements in planning documents and resource consent authorities must have regard to relevant provisions when considering resource consent applications. Under the RMA, the only mandatory national policy statement is the New Zealand Coastal Policy Statement (coastal policy statement). Its purpose is to state policies in order to achieve the purpose of the Act in relation to the coastal environment of New Zealand.

The coastal policy statement guides regional and city and district councils in their day-to-day management of the coastal environment. It is of particular relevance in respect of this evaluation report as Policy 6 of the coastal policy statment promotes activities that have a functional need, an efficient use of occupied space and maintaining the character of the built environment in the CMA, amongst other things.

The current coastal policy statement contains 29 policies and took effect in December 2010. The previous one came into effect in 1994 and our operative Regional Policy Statement (policy statement) and operative regional coastal plan were prepared under this regime and therefore 'give effect' to the previous coastal policy statement.

It is more directive than the previous coastal policy statement and focuses on "avoiding" adverse effects, particularly in relation to significant values (such as outstanding natural character and threatened species), in order to address cumulative effects. It provides strong direction on the need for strategic planning to identify where particular activities are inappropriate (policy 7) and has a greater focus of the effects of climate change, in particular sea-level rise.

National Policy Statement on Electricity Transmission 2008

The new plan must give effect to the requirements in the National Policy Statement on Electricity Transmission 2008 (electricity statement) which sets out objectives and policies to enable the management of the effects of the electricity transmission network under the RMA.

Policy 7 of the electricity statement seeks to minimise the adverse effects of the transmission network on urban amenity and to avoid the adverse effects on areas of high recreational value or amenity and existing sensitive activities. The coastal marine area is acknowledged as having high recreational and amenity value, so giving effect to Policy 7 is of particular relevance.

Policy 8 requires that the planning and development of transmission networks should seek to avoid adverse effects on outstanding natural landscapes, areas of high natural character and areas of high recreational value and amenity, and existing sensitive activities. This policy is particularly relevant for the coastal marine area as outstanding natural landscapes and areas of high natural character have either been identified or there are policies in the proposed plan seeking their protection.

Regional Policy Statement for Northland

The regional council has mapped the landward extent of the coastal environment of the region and included this mapping in the Regional Policy Statement for Northland (policy statement). This will assist councils with implementing the coastal policy statement (as well as the policy statement) and the policy statement contains many policies that specifically apply to land within the coastal environment.

The main section of the policy statement that relates to use and allocation of coastal water space is section 4.8 ("Efficient use of coastal water space"). This section contains five policies that provide a platform for the regional coastal plan to include rules and policy to efficiently manage coastal water space.

Policy 4.8.1 – *Demonstrate the need to occupy space in the common marine and coastal area* – requires decision-makers to ensure that there is a justified need to occupy space in the common marine and coastal area. It also outlines that occupation that is contrary to the policy may be appropriate where the activity will make a significant contribution to the local area or region.

Policy 4.8.2 – *Allocating space in high demand zones* – this policy outlines that in high demand zones, the council will consider alternative allocation mechanisms (other than first in first served) to achieve the most efficient use and allocation of coastal space. This could include mechanisms such as tendering or balloting.

Policies 4.8.3 – *Coastal permit duration* – this policy sets out the main factors to be considered in determining expiry dates for coastal permits in order to promote efficient use and allocation of coastal space.

Policy 4.8.4 – *Private use of common marine and coastal area* – this policy encourages activities that occupy space in the common marine and coastal area to provide an environmental or public benefit (examples could be coastal occupation charges, financial contributions or the creation of jobs for locals).

Policy 4.8.5 – *Aquaculture* – this policy gives effect to policy 8 of the coastal policy statement and provides a framework for ensuring that aquaculture, in appropriate places, will be provided for in Northland.

Within the "Regional form and infrastructure" section (section 5), there is one policy that directly relates to use and development within the coastal environment.

Policy 5.1.2: *Development in the coastal environment* – this policy seeks to enable people and communities to provide for their well-being through appropriate subdivision, use and development within the coastal environment that:

Consolidates urban development within or adjacent to existing coastal settlements and avoids sprawling and sporadic patterns of development; ensures sufficient development setback from the coastal marine area to maintain and enhance public access, open space and amenity values; ensures adequate infrastructure services will be provided for the development; and avoids adverse effects on access to and use of surf breaks of national significance (located at Ahipara, Far North).

Iwi/hapū environmental management plans

Iwi/hapū environmental management plans are planning document recognised by an iwi authority (the authority that represents an iwi and that is recognised by that iwi as having authority to do so). Iwi/hapū environmental management plans may be formal planning documents similar to council policy documents, or they may be a statement of iwi/hapū policies in a less formal and detailed memo or report. Plans may be developed by iwi, hapū or whānau and provide a statement on the position of tangata whenua on a range of issues so that these can be heard and considered by councils and other stakeholders. For more information refer to the the regional council's website – www.nrc.govt.nz/iwiplans .

The main management methods raised in iwi planning documents regarding the coast include but are not limited to:

- Promoting aquaculture management protocols to minimise the effects of aquaculture structures through the degradation of the marine and coastal area, while also recognising that aquaculture has the potential to enhance economic and social well-being of iwi/hapū.
- Lobby for the appropriate planning of marinas and moorings to avoid, remedy or mitigate adverse effects to the marine and coastal area.
- Lobby for the appropriate planning of subdivisions to avoid, remedy or mitigate adverse effects to the marine and coastal area.
- To collaborate and confer with agencies and stakeholders to care for the conservation of the sea.
- Promote and enhance partnerships between iwi/hapū and central government, regional and district councils on all resource management issues.
- Advocate the protection of mauri of water through effective policy and planning instruments.

8.3 Moorings

8.3.1 Executive summary

This report evaluates the management of moorings in Northland (both within designated mooring zones and outside). It does not cover:

- Mooring zones with potential for expansion, see 14.5 'Appendix 5 - Existing mooring areas evaluation';
- Marinas (and their management), see section 8.12 'Marinas', and
- Vessel anchorage, see section 8.5 'Anchorages and anchoring'and
- the discharge of sewage from moored vessels .

The key issues associated with the way moorings are currently managed include:

- Demand for new moorings exceeding supply in many designated mooring zones; and
- There are more than 400 existing 'out of zone' moorings in Northland and approximately half do not have resource consent [(3)]; and
- 'Out of zone' moorings have the potential to exclude other activities from using parts of the CMA (particularly where moorings are grouped) and have potiential to have adverse effects on the values of Outstanding Natural Landscapes.

With this in mind, the report evaluates three 'packages' of options to manage moorings: retaining the status quo (existing provisions in the Regional Coastal Plan) as well as comparatively medium and lighter regulatory approaches. A key difference between the options is that under existing rules the placement of a new mooring in a mooring zone is a discretionary activity. Under the medium regulatory approach, this would be a controlled activity (meaning that a consent is required but must be granted) and under the lighter regulatory approach, new moorings in mooring zones are permitted.

The preferred management option for the Regional Plan is Option C – lighter regulatory approach. The principle reason being that it is the best option with regards to achieving our first two high level objectives (1.maximising certainty and minimising regulatory costs for new swing moorings in mooring zones and 2. minimise costs to the regional council dealing with existing moorings that can not get resource consent approval). Greater weight has been afforded to these objectives than the third (minimise likelihood of new moorings having adverse effects on significant marine areas) on the basis that while many existing mooring zones are at capacity, the new plan will seek to steer new moorings into mooring zones and make it as cheap and easy as possible to get a new mooring within mooring zones.

Option C 'permits' new swing moorings in mooring zones. A key consideration for managing moorings in Northland is how council manages moorings outside mooring zones . At the time this report was written, there were approximately 230 existing unauthorised 'out of zone' moorings (the majority of these have been in place for decades). Option C would 'permit' (subject to compliance with conditions) them so long as they are not within regionally significant anchorage areas. This would result in significant financial savings for the council and mooring owners compared to the other options (especially Option A). The rules and key policy approach for this management option are summarised in the following table.

Note: Evaluation of the management options does not include a discussion or assessment of shore-based facilities or the effect additional moorings may have on mooring areas where these facilities are at or near capacity.

3 the current Regional Coastal Plan does not permit them.

Swing moorings within mooring zones	Moorings outside mooring zones, significant marine areas and regionally significant anchorages	Moorings within significant marine areas and regionally significant anchorages	New moorings within mooring areas with limited shore-based facilities	Key policy approach
Permitted (subject to compliance with conditions).	Discretionary for new moorings. Permitted for existing moorings licensed (under the Navigation Safety Bylaw) at 01/01/15 that are outside of storm anchorages.	Non-complying for outstanding natural character areas, surf breaks of national significance and outstanding natural features. Discretionary activity for new moorings within Significant Ecological Areas. Permitted for existing moorings licensed at 01/01/15 that are outside of storm anchorages.	Restricted Discretionary	New moorings in significant marine areas and storm anchorages not appropriate unless they can meet 'exceptions' test. People applying for resource consents for new out of zone moorings must: • Demonstrate why it is not appropriate to be located within a mooring zone; and • Demonstrate why short-term anchorage, as opposed to a permanent mooring, is not a practicable option; and • Not (in combination with existing moorings) result in more than minor adverse cumulative effects; and • Not be allowed where the mooring will likely result in setting a precedent for new moorings. People applying for resource consents for new Moorings in areas with limited shore-based facilities. • Demonstrate that adequate shore-based facilities are available, or • provide facilities from a nearby property. Resource Consent is to be tied to property and is not transferable.

8.3.2 Relevant provisions

This evaluation supports the following Regional Plan provisions for moorings:

- Rule - C.1.2.3 New swing moorings in a Mooring Zone – permitted activity
- Rule - C.1.2.4 Existing mooring in a Mooring Zone – permitted activity
- Rule - C.1.2.5 Relocation of a mooring by Regional Harbourmaster - permitted activity
- Rule - C.1.2.6 Maintenance and repair of moorings – permitted activity
- Rule - C.1.2.7 Existing swing mooring outside Mooring Zone – permitted activity
- Rule - C.1.2.8 New mooring a mooring zone with limited shore-based facilities - restricted discretionary
- Rule - C.1.2.9 Placement or Relocation of a Mooring – discretionary activity

- Rule - C.1.2.9 Moorings in significant areas – non-complying
- Rule - C.1.8 Coastal Works General Conditions

- Policy - D.5.9 Moorings outside Mooring Zones
- Policy - D.5.10 New moorings in Mooring Zones with limited shore-based facilities
- Policy - D.5.17 Marinas and Moorings in high demand areas

8.3.3 The problem, opportunity and/or requirement

This report evaluates the management of moorings in Northland (both within designated mooring zones and outside). It does not look at:

- The location and extent of Mooring Zones, see section 14.4 'Appendix 4 - Evaluation of new and extended mooring areas';
- Marinas (and their management), see section 8.12 'Marinas'; and
- Vessel anchorage, see section 8.5 'Anchorages and anchoring'.

The key issues associated with how moorings are currently managed include:

- Demand for new moorings exceeding supply in many designated mooring zones; and
- There are more than 400 existing 'out of zone' moorings in Northland and approximately half do not have resource consent; and
- 'Out of zone' moorings have the potential to exclude other activities from using parts of the CMA (particularly where moorings are grouped) and have potiential to have adverse effects on the values of Outstanding Natural Landscapes.
- Use of moorings putting pressure on land-based facilities, and in some locations during high use periods the pressure exceeds supply; and
- Administrative costs (mooring owners and council) of authorising moorings in mooring areas.

Northland is only a few hours drive from Auckland, New Zealand's largest city. The coast provides a playground for increasing numbers of holiday-makers from Auckland and further afield. Nearly one million visitors come to Northland each year, mainly during the summer, to enjoy the attractions of the coastline. Our region has a large number of recreational vessels, and this number is likely to increase as Northland and Auckland's populations grow (Northland is projected to grow to 181,600 and Auckland to 2,010,500 by 2033[4]). Many recreational vessels are permanently stored in the coastal marine area, either in marinas or on moorings. While moorings enable recreational use of the coastal marine area, individual moorings and groups of moored vessels may have adverse effects on the environment, particularly on natural character, landscape, visual and amenity values.

There are currently approximately 2870 licensed moorings in Northland. The table below shows where they are located and what type of moorings they are:

Existing moorings in Northland.

Mooring type	Number
Swing moorings **inside** mooring areas	2196
Other type of moorings **inside** mooring areas	209
Total number of moorings inside mooring areas	**2405**
Moorings **outside** mooring areas (consented)	236

4 *Statistics NZ 2013.*

Mooring type	Number
Moorings **outside** mooring areas (unconsented)	233
Total number of moorings outside mooring areas	469

The current approach (determined through Plan Change 1 (Moorings and Marinas) to the Regional Coastal Plan – declared operative on 1 August 2014) is to limit the proliferation of moorings around the coast by facilitating the concentration of moorings into Mooring Zones and discouraging moorings outside these areas. Having dedicated Mooring Zones leads to the efficient use of the coast by:

- Concentrating moorings in suitable areas and minimising a proliferation of moorings in other less suitable areas; and
- Minimises potential for conflict with other users of coastal space; and
- Reduces pressure on areas of significant marine value; and
- Supports the strategic planning and provision of associated land-based services and facilities such as parking, toilets, dinghy racks and rubbish facilities.

However, there are currently around 470 moorings (of which 450 are swing moorings) located outside of Mooring Zones. Around 50% of these are unconsented (and therefore require resource consent approval to remain). All unconsented moorings have been in place since before the Regional Coastal Plan became operative (2004) and most were in place before the RMA was enacted (1991). They can therefore be seen as an established part of the existing environment and add to the 'character' of the coast. To have a mooring in Northland, there is also a requirement to have a mooring licence (issued annually) under the Northland Regional Council Navigation Safety Bylaw and to have your mooring inspected at least once every three years (to reduce the risk of mooring failures). The bylaw also determines such things as the location of moorings as well as the type, size and length of vessels attached to the mooring.

If the new plan adopts a hard line towards management of moorings outside designated mooring zones, many existing moorings are unlikely to be granted resource consent because they would not meet the performance standards or policies (this would apply to both renewals and applications for new resource consent) . Therefore the majority of moorings outside mooring zones would need to be removed – resulting in a loss of vessel storage capacity. There would also be a large financial cost associated with this option. In many cases, there are no mooring zones nearby and/or the closest mooring areas are full.

The ability for people to store boats in our coastal waters has some positive economic benefits for the community. These primarily come from the servicing of vessels, the purchasing of fuel, groceries and other supplies as well as servicing the mooring itself. Determining the exact financial contribution from moorings is difficult because information on spending is not readily available. However, it is fair to say that value is added to the regional economy from the use and maintenance of moorings, particularly where moorings are owned by people outside the region [5].

Importantly, many existing mooring areas are at or near physical capacity (especially in the far north) and in many cases, also exceed the capacity of the shore-based facilities and services to support them. Most of them are located in and around the Bay of Islands, which illustrates the popularity of this area for moorings and recreational boating activities in general. This means that there is not enough space to accommodate new moorings unless mooring use is intensified within mooring areas (by moving to a different mooring system) or existing mooring areas are expanded, or additional mooring areas are created and/or the rule framework for moorings outside mooring zones is relaxed. (It should be noted that not all mooring areas are suitable for pile or trot moorings because they are too exposed to wind and waves.)

With this in mind, the regional council produced a 'non-statutory' Moorings and Marina Strategy in 2014. This strategy focuses on the Bay of Islands, which is where there is the most pressure for new moorings. It identified a number of potential extensions to existing mooring areas and an expected time-line of when they should be developed. The new plan therefore needs to recognise and provide for this where appropriate.

5 *Moorings and Marina Strategy for Northland July 2014.*

8.3.4 Management options

This section summarises the suite of management options for moorings. The intention is not to identify every different combination of approach as there would be many, but to represent the range of options and highlight key differences in approaches.

There are some provisions in the Regional Coastal Plan that do not need to be changed. There are also some new obvious and likely uncontentious rules to be included in the new regional plan, which are summarised as follows:

- The ongoing occupation of space for moorings in mooring zones should be permitted subject to conditions. This is the rule in the Regional Coastal Plan. It is consistent with the approach other councils take and to date, and we are not aware of any concerns about it.
- The maintenance and repair of moorings should be a permitted activity. This is the rule in the Regional Coastal Plan, and again no concerns have been raised about the rule.
- New pile and/or trot moorings within mooring areas should be a discretionary activity. This is also the rule in the Regional Coastal Plan and there have been no complaints or concerns with this rule. These types of moorings are different than swing moorings and they are not appropriate in all mooring areas (that is, they need a relatively high level of shelter from the wind the most of the time because vessels cannot swing around to face the wind). This is why their initial placement needs to be assessed through the resource consenting process.

Key terms

An explanation of the key terms used in describing the management options:

Swing mooring

A swing mooring consists of a single anchor on the sea floor with a rope, cable, or chain running to a float on the surface. The float allows a vessel to find the rope and connect to the anchor. A vessel attached to this kind of mooring swings in a circle when the direction of wind or tide changes.

Pile moorings

Pile moorings are a method of mooring a vessel fore and aft to piles driven vertically into the seabed. They are a space efficient way to store vessels, with vessels effectively only taking up the space between the piles, allowing more vessels to be stored in the same amount of space.

Trot moorings

A trot mooring consists of a long and heavy ground chain anchored at each end, with risers at intervals; the boats are tethered fore and aft, so that a single assembly serves to moor a number of vessels. Trot moorings use about the same space and require similar conditions (that is, shelter and current) as pile moorings.

Significant Marine Areas

These are the outstanding, nationally significant areas described in policies 11(a) (biodiversity), 13(1) (natural character), 15(a) (natural features and landscapes) and 16(b) (surf breaks) of the New Zealand Coastal Policy Statement 2010. These policies direct that adverse effects on the prescribed matters must be avoided.

Regional Significant Storm Anchorages

Recognised places to shelter during storm conditions. These areas will be mapped in the new regional plan.

'Exceptions'

These apply to policies and rules for moorings outside mooring zones. The exceptions are specific reasons or circumstances why a mooring might be appropriate in an area where it would otherwise generally not be appropriate. These are:

- When the mooring is associated with a property only legally accessible by water; or

- Associated with a maritime-related commercial enterprise that could not be located within a mooring area; or
- For pubic benefit to enhance public access and minimise environmental effects from repetitive anchorage (for example, a publicly available mooring at the Poor Knights marine reserve).

Shore-based facilities

These are facilities on land that support moorings in the coastal marine area such as parking, rubbish disposal, dingy or tender storage and toilets.

Management options

Option A: status quo – heavy regulatory approach

This option is to limit the proliferation of moorings around the coast by facilitating the concentration of moorings into mooring zones and to discourage moorings outside these areas through strong policy and rules. It can be considered a heavy regulatory approach relative to other options. A resource consent is required for the initial placement of a mooring in a mooring zone then the ongoing occupation of the coastal marine area is permitted (subject to compliance with standards and terms). This is the current approach for managing moorings in Northland. It was introduced as Plan Change 1 to the Regional Coastal Plan, which was declared operative on 01 August 2014.

Swing moorings within mooring zones	Moorings outside mooring zones,significant marine areas and storm anchorages	Moorings within significant marine areas and storm anchorages	New moorings within mooring areas with limited shore-based facilities	Key policy approach
Discretionary for initial placement of new mooring then permitted. Placement of moorings licensed at 30 June 2010 permitted.	Discretionary if meets exceptions requirements otherwise non-complying.	Non-complying if meets exceptions requirements otherwise prohibited.	Nil	Limit proliferation of moorings by concentrating moorings into designated mooring areas and strongly discouraging moorings outside these areas. Avoid, as far as practicable, the cumulative effects of moorings. Moorings are generally appropriate: • where they are in mooring zones and there is space and adequate shore-based facilities or they can provide necessary facilities, or • where they are associated with a property only legally accessible by water, or • for pubic benefit to enhance public access, or • where they are associated with a maritime-related commercial enterprise that could not be located within a mooring zone.

Option B: medium regulatory approach

This option is a 'middle of the road' approach to moorings management. It involves concentrating new moorings in designated mooring areas and limiting them outside the areas unless there are valid reasons why a mooring is appropriate. This option differs from the status quo in that it is more permissive across the board (for example, controlled activity placement of new moorings in mooring zones and generally discretionary activities for moorings outside mooring zones). The option is similar to the Regional Coastal Plan's approach to mooring management.

Swing moorings within mooring zones	Moorings outside mooring zones, significant marine areas and storm anchorage	Moorings within significant marine areas and storm anchorage	New moorings within mooring areas with limited shore-based facilities	Key policy approach
Controlled for initial placement of new moorings. Permitted for existing moorings.	Discretionary.	Non-complying.	Non-complying.	Limit proliferation of moorings by concentrating new moorings into designated mooring areas and discouraging moorings outside these areas unless applicants can justify why a mooring outside a mooring zone is appropriate. Policy guidance on justifying why moorings outside mooring zones are appropriate. Policy guidance requiring shore-based facilities

Option C: lighter regulatory approach

This is the most permissive of options tested. That is, new swing moorings in mooring zones would be a permitted activity as would existing moorings outside mooring zones.

This approach is based on how other councils throughout the country are managing new moorings through their new regional plans: permitted activity for swing moorings in mooring zones, discretionary activity for new moorings outside significant marine areas and non-complying within significant marine areas. This option also permits existing out of zone moorings that were licensed at 1 January 2015, provided they are not located within a mapped storm anchorage area.

Swing moorings within mooring zones	Moorings outside mooring zones, significant marine areas and storm anchorages	Moorings within significant marine areas and storm anchorages	New moorings within mooring areas with limited shore-based facilities	Key policy approach
Permitted – subject to compliance with conditions.	Discretionary for new moorings. Permitted for existing moorings licensed at	Non-complying for outstanding natural character areas, surf breaks of national	Restricted Discretionary	New moorings in significant marine areas and storm anchorages not appropriate unless they can meet 'exceptions' test.

Swing moorings within mooring zones	Moorings outside mooring zones, significant marine areas and storm anchorages	Moorings within significant marine areas and storm anchorages	New moorings within mooring areas with limited shore-based facilities	Key policy approach
These include that the vessel is licensed and there s enough physical space in the mooring area.	01/01/15 outside of storm anchorages.	significant and outstanding natural features. Discretionary activity for new moorings within Significant Ecological Areas . Permitted for existing moorings licensed at 01/01/15 outside of storm anchorages.		People applying for a new out of zone mooring must: • Demonstrate why it is not appropriate to be located within a mooring zone; and • Demonstrate why short-term anchorage, as opposed to a permanent mooring, is not a practicable option; and • Not (in combination with existing moorings) result in more than minor adverse cumulative effects; and • Not be allowed where the mooring will likely result in setting a precedent for new moorings. People applying for a new mooring in areas with limited shore-based facilities must: • Demonstrate that adequate shore-based facilities are available, or • provide facilities from a nearby property. Resource Consent is to be tied to property and is not transferable.

8.3.5 High level objectives and measures

Section 32 requires an assessment of *"...the efficiency and effectiveness of the provisions in achieving the objectives..."*. Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section 1.6 'Evaluation approach' for more details.

'High level objectives':

- capture the fundamental things (or values) that matter to people (the key costs and benefits) when determining the best management option;
- signal a direction for where we want to head, without stating how far we go; and
- are what the management options are assessed against to determine their efficiency and effectiveness (s32(1)(b)(ii)).

Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against.

High level objective	Measure
Maximise certainty and minimise regulatory costs for new swing moorings in mooring zones.	Cost and activity status for new swing moorings in mooring zones: 1 = discretionary – $576.00 (current application fee) 2 = controlled – $576.00 (current application fee) 3 = permitted – no cost
Minimise costs to the regional council dealing with existing moorings that cannot get resource consent approval.	Financial cost to council to remove all illegal moorings: 1 = very high cost – greater than $150,000 2 = high cost – $50,000-$150,000 3 = medium cost – between $25,000-$50,000 4 = low cost – less than $25,000 5 = no cost
Minimise likelihood of new moorings having adverse effects on significant marine areas.	Likelihood of adverse effects on significant marine areas occurring from any particular mooring proposal: 1 = high 2 = moderate 3 = low 4 = very low 5 = none

Explanation for the high level objectives and measures

Minimise regulatory costs associated with new swing moorings in mooring areas

We chose this high level objective because, generally speaking, the most appropriate location for new swing moorings is within designated mooring zones, as these are locations that council and the community have deemed to be suitable to concentrate moorings. It is appropriate to have an objective relating to making it easier and cheaper to get a new (swing) mooring in mooring zones, thereby encouraging new moorings to concentrate into mooring zones. The associated measure is the activity status for new swing moorings and associated cost. This ranges between a discretionary activity, which comes with an application fee (and the most hassle) to a 'permitted' activity, which does not have an application fee. It needs to be recognised that there is very little difference between a discretionary activity and a controlled activity. This is because they both will be non-notified and have the same application fee.

Minimise costs to the regional council dealing with unauthorised existing moorings

We chose this high level objective because there are currently 233 existing unconsented (that is, unauthorised) moorings located outside mooring zones in Northland. Depending on the management regime, these will be classed as either prohibited, non-complying, discretionary or permitted activities. The likelihood that they will be authorised to remain are therefore highly dependent on the management regime. If the mooring holder is not able to gain resource consent then technically, the mooring (and associated tackle/hardware) will need to be removed from the coastal marine area. This may generate financial costs to the regional council (and ratepayers). These costs include engaging contractors to remove moorings and dispose of equipment, as well as council expenses.

The regional council's maritime team have assumed that the cost of engaging contractors to remove individual moorings will be $1000 per mooring. Each mooring will require a site visit by a council vessel, which costs $300 and there would be 10 hours of staff time to deal with each mooring at $85 per hour. This equates to a total cost of $2150 to remove a single mooring.

The measure therefore is the financial cost to council to remove all illegal moorings. This ranges from 'very high' – greater than $250,000 (equating to a score of 1) to 'no cost' (score of 5).

Minimise likelihood of new moorings having adverse effects on significant marine areas

This objective is to minimise potential adverse effects on the areas described in policies 11(a), 13(1)(a), 15(a) and 16(b) of the New Zealand Coastal Policy Statement 2010. These policies direct that adverse effects on the prescribed 'outstanding' matters must be avoided. The King Salmon Supreme Court decision has determined that there is little flexibility to depart from this requirement. This contrasts to effects on other uses and values where there is more scope for trade offs.

The scale is the likelihood of any particular new mooring causing adverse effects on the values and characteristics of significant marine areas. It is a judgment call that will generally be based on the strength of the policy and the extent it will be given effect to. The key test for is whether adverse effects will occur – as that is the bar set by the New Zealand Coastal Policy Statement. Also, the reality is that if adverse effects are allowed, they would unlikely be more than minor. In other words, given the requirements of the New Zealand Coastal Policy Statement, it is very unlikely that resource consent would be granted allowing more than minor adverse effects on outstanding or significant areas natural areas.

High level objectives not included

Section 32 requires an assessment of the impacts on economic growth and employment opportunities (s32(2)(a)). However, the impact of the options on these is imperceptible and/or can't be determined with any confidence. Therefore, economic growth and employment opportunities have not been included as high level objectives. For more information go to the section 1.7 'Assessing impacts on economic growth and employment opportunities'.

Minimise potential for new out of zone moorings to cause adverse cumulative effects

This objective was considered but disregarded for several reasons. Firstly, the new regional plan will contain maps of significant marine areas in the coastal marine area. These are outstanding natural character, outstanding natural landscapes and features as well as significant marine biodiversity areas. As mentioned above, all the options require new moorings to avoid any effects on the values and characteristics of these areas – a high test, which should ensure that the risk of cumulative effects of moorings are avoided in these sensitive areas. Additionally, the new plan will also contain overlays of regionally significant anchorage areas. New moorings will be a non-complying activity in these areas, which will also help minimise the risk of cumulative effects occurring. Lastly, when this objective was evaluated against the three proposed management options, it turned out that they all scored the same because the activity status is the same across all three management options – discretionary activity (status quo is actually either non-complying or discretionary depending on the situation). This means that a resource consent is required for new moorings and potential adverse effects can be assessed on a case-by-case basis.

Minimising impacts of moorings on land based services

This high level objective was considered because historically, the provision of land-based services and facilities has been a key issue with managing the impacts of moorings in Northland. This objective was however discarded because there will be new policies in the new plan to ensure that new moorings out of mooring zones can provide land-based facilities. Additionally, any differences between management approaches would not be able to 'tease out' differences regarding whether or not this high level objective could be achieved. In reality, it would come down to a case-by-case basis, depending on the exact location of the mooring and the amount of existing land-based services.

8.3.6 Evaluating the management options

High level objective and measure	Option A: status quo – heavy regulatory approach	Option B: medium regulatory approach	Option C: lighter regulatory approach
Maximise certainty and minimise regulatory costs for new swing moorings in mooring zones. *Measure:* *activity status for new swing moorings in mooring areas.* 1 = discretionary – $576.00 (current application fee) 2 = controlled – $576.00 (current application fee) 3 = permitted – no cost	1 (Discretionary activity and $576 application fee).	2 (Controlled activity and $576 application fee).	3 (Permitted activity – no application fee).
Minimise costs to the regional council dealing with existing moorings that cannot get resource consent approval. *Measure:* *financial costs to council to remove illegal moorings.* 1 = very high cost – greater than $150,000 2 = high cost – $50,000-$150,000 3 = medium cost – between $25,000-$50,000 4 = low cost – less than $25,000 5 = no cost	1 (Estimated removal of 100 moorings – cost of $215,000).	3 (Estimated removal of 20 moorings – cost of $43,000).	5 (Not estimated to have to remove any moorings).
Minimise likelihood of new moorings having adverse effects on significant marine areas. *Measure:* *likelihood of adverse effects on significant marine areas occurring from any particular mooring proposal.* 1 = high 2 = moderate 3 = low	4.5	2	3.5 3 for significant marine ecological areas and 4 for significant natural areas.

High level objective and measure	Option A: status quo – heavy regulatory approach	Option B: medium regulatory approach	Option C: lighter regulatory approach
4 = very low 5 = none			

Certainty about the evaluation

Overall we are reasonably confident about the accuracy of the evaluation for all options. We do not think it is appropriate to get more information to increase the accuracy of our evaluation as it is very unlikely to change the relative differences between the options.

The first objective and measure is an accurate evaluation as it is directly linked to the activity status of resource consent applications.

There is some uncertainty about the second high level objective (minimise costs to the regional council dealing with existing moorings that cannot get resource consent approval). This is because we have had a 'best guess' but don't know with certainty how many existing unauthorised moorings will be declined resource consent, how many might seek legal proceedings and the associated financial cost to contractors and council staff.

The last objective (minimising adverse effects on significant marine areas) has a bit of uncertainty because it is a judgment of how a particular mooring application would be considered in respect to its potential adverse effects. The judgement is based on case law, important values in the surrounding areas and local experiences associated with resource consent application proceedings for moorings.

Time-frame of the evaluation

The evaluation is made for the life-time of the plan (10-15 years).

The preferred management option

The preferred management option for the proposed Regional Plan is Option C – lighter regulatory approach.

The principle reason is that it is the best option with regards to achieving the first two high level objectives. Greater weight has been afforded to these objectives than the last one in recognition that while many existing mooring zones are at capacity, the new plan should steer new moorings into mooring zones and make it easier to get a new mooring within mooring zones. Option C permits new swing moorings in mooring zones. Additionally, there are currently approximately 230 existing unconsented 'out of zone' moorings in Northland (the majority of these have been around for decades). Option C would permit, subject conditions, existing out of zone moorings so long as they are not within storm anchorage areas. This would result in significant financial savings for the council compared to the other options (especially option A). This benefit outweighs the potential impacts that new moorings may have on significant marine areas because any new application (under any management option) within these areas requires resource consent and can be declined.

Option C did not score the best against the last objective but in reality, there will be strong policies to ensure that activities do not adversely affect the values and characteristics of these significant areas. What this means is that even if moorings are classed as a discretionary activity, if they are deemed likely to adversely affect the values and characteristics of significant marine areas, then they are unlikely to be approved. This should therefore ensure a low likelihood of moorings having adverse effects on significant marine areas under this management option.

The next best option is Option B – medium regulatory approach. The key differences between options B and C are the activity status for new moorings within mooring zones (controlled versus permitted) , the activity status for existing moorings outside mooring zones (discretionary versus permitted) and the activity status for new and existing moorings in significant ecological areas. While option B is more restrictive (non-complying rather than discretionary) than the other options, and the natural assumption is that it would therefore provide better protection for significant ecological areas but this is not the

case. In order for a consent to be granted for a non-complying activity the activity must either have no more than minor adverse effects or not be inconsistent with the policies of the plan. In the case of moorings, we believe it would be possible for an applicant to argue that a single mooring would not have any more than minor adverse effects. This will then, in our opinion , open the gate to other moorings being granted in the same area. Council will then have to determine the point at which the cumulative effects of the moorings becomes more than minor and when consents should be declined. In practise this is difficult to establish. In the case of moorings in significant ecological areas a non-complying status creates less certainty and is less desirable than discretionary status.

Continuing with the status quo (Option A) has come out as the least preferred option. It scored the best against the last objective however, as outlined above, greater weight has been afforded to the other objectives. Actively implementing the existing policy and rule framework will generally make it very difficult to get approval for a mooring outside of mooring areas (despite the fact that many existing mooring zones are at capacity and likely see consent being refused to large numbers of existing unconsented moorings outside of designated mooring zones. The vast majority of these unconsented moorings have been around since before the existing coastal plan became operative (2004) but despite this point, they technically need to be consented or removed. Large-scale removal of moorings could lead to significant costs to ratepayers and cause public backlash, primarily because these moorings have been around for so many years, they are part of the coastal landscape and arguably are not causing any adverse environmental effects.

8.4 Structures, use and development

8.4.1 Executive summary

The term "structure" is defined in the Resource Management Act as: *"...any building, equipment, device, or other facility made by people and which is fixed to land; and includes any raft."* Within the coastal marine area, being "fixed to land" means fixed to the foreshore or seabed.

This report evaluates the management options for regulating general structures in the coastal marine area. "General structures" refers to all structures that are not:

- Moorings – see the section 8.3 'Moorings';
- Associated with aquaculture – see the section 8.6 'Aquaculture';
- Marinas and structures associated with marinas – see the section 8.12 'Marinas';
- Hard protection structures (such as seawalls) – see the section 10.5 'Coastal hazard risk';
- New structures within significant marine areas (such as within outstanding natural character areas) – see the section 9.4 'Outstanding and significant natural areas'; and
- Historic heritage structures in the coastal marine area – see the section 9.3 'Historic heritage'.

Many structures are necessary to provide for our social and economic well-being and can enhance public access to the coast (such as jetties, boat ramps and wharves). However, some can adversely affect natural character values, coastal processes, public access and visual amendity around the coast, especially if they are located in sensitive (that is, outstanding or significant) environments.

The Regional Coastal Plan divides the coastal marine area into six marine management zones. One of the key reasons for dividing the coast into different zones is that management approaches can be tailored for enabling the key activities and structures within the zone (such as commercial structures within port and wharf areas). This gives councils and communities a greater level of certainly with regards to which parts of the coast are appropriate for various activities and which areas are to be restricted or 'no-go' areas for various activities.

Section 12 of the Resource Management Act requires that a resource consent is obtained before constructing, maintaining or removing any structures in the coast (unless expressly allowed by a rule in a regional coastal plan). This illustrates that regional coastal plans can be an enabling document to permit structures and activities that would otherwise be required to apply for a resource consent. The default position under the RMA is that if there is no rule in a regional coastal plan (and a consent is required for an activity) then the activity is to be treated as a discretionary activity.

Four management options for general structures have been evaluated: continuing the status quo (existing provisions in the Regional Coastal Plan) and comparatively 'heavy', 'medium' and 'lighter' regulatory approaches.

The preferred management option for the Notified Regional Plan is Option C – medium regulatory approach because overall, it best addresses the high level objectives. It scored the second best (slightly behind option D) against the first objective and also ranked second equal against the last objective. It should be recognised that under option D, there are only two activities that are slightly more permissive than Option C (only one would be likely to have a cheaper application fee). This illustrates that there is very little difference between these two options with regards to scoring against the first objective.

The rules and relevant policies in this management option are summarised in the following table.

General structures	Structures with no functional need	New minor structures	Temporary structures	Structures in Coastal Commercial Zone	Structures in Whangarei City Centre Marine Zone	Key policy approach
Discretionary.	Non-complying.	Permitted.	Permitted.	New = discretionary. Existing = controlled.	Controlled activity for jetties, boat ramps, pontoons, walkways and viewing platforms. Otherwise discretionary.	Recognition of what Whangārei City Centre Marine Zone and coastal commercial zones are and enable appropriate development in these zones.

8.4.2 Relevant provisions

This evaluation supports the following Regional Plan provisions:

- Rules - All rules in section C.1.1 – General Structures
- Section C.1.8 - Coastal works general conditions
- Policy D.2.3 - Application of policies in the Regional Policy Statement for Northland to non-complying activities
- Policy D.5.7 - Coastal commercial zone
- Policy D.5.8 - Whangārei city centre marine zone
- Policy D.5.21 - Underwater noise

8.4.3 The problem, opportunity and/or requirement

The term "structure" is defined in the Resource Management Act as: *"...any building, equipment, device, or other facility made by people and which is fixed to land; and includes any raft."* Within the coastal marine area, being "fixed to land" means fixed to the foreshore or seabed.

This report evaluates the management options for regulating general structures in the coastal marine area, but does not address the following types:

- Moorings – see the section 8.3 'Moorings';
- Structures associated with aquaculture – see the section 8.6 'Aquaculture';
- Marinas and structures associated with marinas – see the section 8.12 'Marinas';
- Hard protection structures (such as seawalls) – see the section 10.5 'Coastal hazard risk';
- New structures within significant marine areas (such as within outstanding natural character areas) – see the section 9.4 'Outstanding and significant natural areas'; and
- Historic heritage structures in the coastal marine area – see the section 9.3 'Historic heritage'.

The coastal marine area is a 'commons' (meaning that no one owns it) and a finite resource that in some areas is under pressure from competing uses and development.

Many structures are necessary to provide for our social and economic well-being and can enhance public access to the coast (such as jetties, boat ramps and wharves). However, structures can adversely affect natural character values, coastal processes, public access and visual amenity values around the coast (especially if they are located in sensitive – outstanding – environments).

Under section 12 of the RMA, the default is that resource consent (coastal permit) is required for the placement of any structure within the coastal marine area -s12(1) unless the activity is expressly allowed by a national environmental standard or a rule in a regional coastal plan. An additional consent is also required to 'occupy' space in the coastal marine area - s12(2). Currently, under the Regional Coastal Plan, resource consent is generally required for the ongoing occupation of most structures (there are some exceptions for minor structures). However, there are circumstances when the ongoing occupation of space could be a permitted activity subject to conditions because the effects of the activity have already been accepted as appropriate and the requirement to repeatedly renew the consent to occupy space achieves little but incurs a financial cost for structure owners.

The New Zealand Coastal Policy Statement discourages activities in the coastal marine area that do not have a functional need to be located there[6] (also mirrored in the Regional Policy Statement for Northland). This suggests that these types of structures would have to be discretionary, non-complying or prohibited.

The maintenance and enhancement of public access along the coastal marine area is a matter of national importance under the RMA and use and development within the coastal marine area needs to be managed to ensure that any exclusion of the public is temporary and short term, unless exclusion is required for public health and safety or operational purposes, or where rights to exclusively occupy part of the coastal marine area are provided for.

The operative Regional Coastal Plan divides Northland's coastal marine area into six 'zones' (marine management areas), for the purposes of regulating activities within the coastal marine area:

- Marine 1 Management Area – Protection;
- Marine 2 Management Area – Conservation;
- Marine 3 Management Area – Marine farming;
- Marine 4 Management Area – Moorings including marinas;
- Marine 5 Management Area – Port facilities; and
- Marine 6 Management Area – Wharves.

The purpose of dividing the coast into six different marine management areas is that the management approach can be tailored/focused on enabling the key activities/structures within the zone (such as commercial structures within marine management 5 and 6 areas) and therefore council and communities have a greater level of certainly with regards to which parts of the coast are appropriate for various activities and which areas are to be restricted or 'no-go' areas for various activities.

There is general consensus that dividing the coast into various zones has worked well and should continue. This aside, we are proposing to delete the Marine 1 (Protection) Management Area and replace it with more site specific overlays (see 9.4 'Outstanding and significant natural areas' for more detail). The ten year review of the Regional Coastal Plan also identified that there is an opportunity to create new site-specific zones in order to encourage certain development.[7][8]

The existing coastal plan includes rules that permit, subject to conditions, certain structures that were in good order and repair at the time of the regional council's 1992/1993 coastal structures survey. Examples of these structures include navigation aids, dinghy skids used or private boat launching and foot bridges used for public pedestrian traffic. There are however, circumstances when the on-going occupation of space for other structures could become permitted subject to conditions under the new plan. This might be because the effects have already been accepted as appropriate and the requirement to repeatedly renew the consent to occupy space achieves little but imposes financial costs on structure owners or the structures may have 'public good' value (such as wharves). Permitting additional existing structures would therefore reduce compliance costs and the need for 'renewal' consents. There was considerable 'in principle' support for this concept at the coastal water

6 *See Policy 6(2).*

7 *www.nrc.govt.nz/contentassets/0d3e217aec2346549fdbd0b3e579c501/regional-plan-review-summary---coastal-water-space.pdf.*

8 *See section 1.1 of coastal water space.*

space key stakeholder workshop (part of the review of the regional plans) but it was agreed that there would likely need to be strong direction to determine which structures this could apply to (see notes from the workshop for more information:http://www.nrc.govt.nz/contentassets/0d3e217aec2346549fdbd0b3e579c501/coastal-water-space-workshop-notes-a695621.Pdf.).

8.4.4 Management options

This section summarises a suite of options for managing the placement of and occupation of space by structures. The intention is not to identify every different combination of approach as there would be many, but to represent the range of options and highlight key differences in approaches.

There are some provisions in the Regional Coastal Plan that we think do not need to be changed, and regardless are unlikely to be contentious. We also think that there are some new provisions that should be included in the new regional plan. The uncontentious and obvious provisions that we think should be included, without considering other options, are summarised as follows.

- There are many existing small-scale and 'public good' structures that are currently permitted activities. These should continue to be permitted activities. There are also other similar structures that will become permitted activities.
- Consistent with existing rules, the demolition or removal of structures should be a permitted activity (subject to compliance with conditions).
- Consistent with existing rules, maintenance and repair of structures should be a permitted activity.
- If there is no rule for a structure then the default RMA position is that it is a discretionary activity.
- The Regional Coastal Plan identifies existing structures that are either classified as permitted, controlled or discretionary activities. These structures should become permitted or discretionary activities under the new regional plan.
- The existing port zone (marine management 5 zone) and wharf zone (marine management 6 zone) should be merged into a single coastal commercial zone. This is because the intent of these two zones is essentially the same and the existing rules are similar as well.

Key terms

An explanation of the key terms used in describing the options:

General structures

These are typical structures that one might expect to see in the coastal marine area. Examples include grids, jetties, bridges and boat sheds. General structures does not include 'minor' structures and 'temporary' structures.

Coastal commercial zone

Commercial areas of the coastal marine area, predominantly used for port and wharf-related activities.

Minor structures

'These include the following:

- Signs less than 1.25m^2;
- Monitoring/sampling equipment; and
- Aids to navigation; and
- jetties up to 10m2 - this has been included in the existing minor structure rule as several submitters on the draft regional plan suggested including small jetties in the existing minor structure rule as the potential adverse effects are minor and similar in nature to other structures outlined in the rule.

Temporary structure

A structure in the coastal marine area which is not in place for a period exceeding a total of 30 days or part days during a 12 month period, inclusive of the placement and removal.

Option A: retain provisions in Regional Coastal Plan (status quo)

This option involves retaining the relevant rules and policies in the current plan, which can be viewed as somewhere between the stronger and medium regulatory approaches. The Regional Coastal Plan takes quite a cautious approach to use and development in the coastal marine area – this is consistent with most first-generation regional coastal plans.

General structures	Non-functional need structures	New minor structures	Temporary structure	Structures in coastal commercial zone	Whangārei City Centre Marine Zone	Key policy approach
Discretionary	Non-complying	Permitted	Discretionary	New structures = discretionary or restricted discretionary; existing structures = controlled	Discretionary	Structures generally appropriate when have an operational need to locate in the coastal marine area, necessary landward development can be accommodated and effects are avoided to the extent practicable.

Option B: Stronger regulatory approach

This is the most restrictive of options evaluated and is summarised in the following table. There are no permitted activities under this option.

General structures	Non-functional need structures	New minor structures	Temporary structures	Structures in coastal commercial zone	Whangārei City Centre Marine Zone	Key policy approach
Non-complying	Non-complying	Controlled	Discretionary	Discretionary	Discretionary	Strong policy to avoid buildings or non-functional need structures.

Option C: Medium regulatory approach

This option is a 'middle ground' approach between the stronger and lighter regulatory approaches (options B and D). It also includes a proposed spot zone - Whangārei City Centre Marine Zone, which extends from the Te Matau a Pohe bridge in the Hātea River up past the town basin to the coastal marine area boundary and also up the Waiarohia stream to the coastal marine area boundary. The purpose of the zone is to enable the construction of public access structures in order to improve linkages between the coastal marine area and the surrounding land.

Several submitters on the draft regional plan generally supported this option. Perhaps unsurprisingly, most support was for the draft permitted activity rules. Other submitters sought amendments to specific rules. A common request was to relax the rule framework for infrastructure of regional or national significance, especially if it has operational or functional need to be located in the coastal marine area.

General structures	Non-functional need structures	New minor structures	Temporary structures	Structures in coastal commercial zone	Whangārei City Centre Marine Zone	Key policy approach
Discretionary	Non-complying	Permitted	Permitted	New = discretionary; existing = controlled	Controlled activity for jetties, boat ramps, pontoons, walkways and viewing platforms; otherwise discretionary.	• Enable structures consistent with purpose of Whangārei City Centre Marine Zone and Coastal Commercial Zones. • Rely on policies in operative RPS to deal with rules that are non-complying activities

Option D: lighter regulatory approach

This is the most permissive of the options evaluated. That is, most structures would either be permitted or controlled activities (see following table).

General structures	Non-functional need structure	New minor structures	Temporary structures	Structures in coastal commercial zone	Whangārei City Centre Marine Zone	Key policy approach
Controlled	Discretionary	Permitted	Permitted	Controlled	Controlled	To generally allow all structures in the coastal marine area.

8.4.5 High level objectives and measures

Section 32 requires an assessment of "*...the efficiency and effectiveness of the provisions in achieving the objectives...*". Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section 1.6 'Evaluation approach' for more details.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. They signal a direction for where we want to head, without stating how far we go – that comes later (they are the beginnings of objectives).

Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against.

High level objective	Measure
Maximise certainty and minimise regulatory costs to structure proponents.	Resource consent activity status and application cost: 1 = non-complying (typically limited or fully notified) = $3144. 2 = discretionary (typically non-notified) = $838.50 3 = controlled (typically non-notified) = $838.50 4 = permitted activity = no need for a resource consent (no cost). Note: costs do not include those associated with preparing the application or hearing costs.
Minimise adverse effects on the environment.	Ability to practicably control adverse effects: 1 = minor control (likely that adverse effects could occur). 2 = moderate control (medium likelihood that adverse effects could occur). 3 = significant control (unlikely that adverse effects could occur). 4 = full control (impossible that adverse effects could occur – structures prohibited).

Explanation for the high level objectives and measures

Maximise certainty and minimise regulatory costs to structure owners

Unless allowed by a rule in a regional coastal plan, a resource consent is required for the placement of any structure in the coastal marine area. This objective has been chosen because the cost and hassle of applying for a resource consent is probably the most significant regulatory concern for owners/proponents of new structures.

The measure for this objective therefore looks at the cost and activity status for new structures. This ranges from a 'non-complying' activity, which is generally a publically notified application (which has a fixed initial deposit of $3,144[9] and no guarantee of getting resource consent), to a 'permitted' activity (with no cost and no need to apply for a resource consent - zero hassle factor). An assumption has been made that most non-complying activities will either be limited or publicly notified, whereas discretionary and controlled activities will typically be non-notified (and therefore have a fixed initial deposit of $838.50.

Minimise adverse effects on the environment

This objective has been chosen because the Resource Management Act gives the regional council powers to control placement of structures and occupation of space in the coastal marine area on behalf of the wider public – see sections 12 and 30. This is done through rules in regional coastal plans. Depending on factors such as location and size, permitting or granting resource consent to the placement of structures within the coastal marine area has the potential to cause adverse effects on the environment. The degree to which adverse effects can practicably be minimised is directly related to the level of control in the rules.

9 *See Northland Regional Council Charging policy 2015/16.*

We have used a constructed measure to assess whether the management options are likely to practicably control (avoid or mitigate) adverse effects on the environment. The measure ranges from minor control (1), which can be viewed as a permitted or controlled activity, to full control (4), which equates to a prohibited activity. A constructed measure has been used because it is very difficult to quantify the actual and potential adverse effects of any particular management option.

High level objectives not included

Section 32 requires an assessment of the impacts on economic growth and employment opportunities (s32(2)(a)). However, the impact of the options on these is imperceptible and/or can't be determined with any confidence. Therefore, economic growth and employment opportunities have not been included as high level objectives. For more information go to the section 1.7 'Assessing impacts on economic growth and employment opportunities'.

Minimise risk of new structures causing cumulative effects in the general coastal marine zone.

This objective was considered but disregarded because of several reasons. Firstly, the new regional plan will contain maps of 'significant' areas in the coastal marine area. These are outstanding natural character, outstanding natural landscapes and features as well as significant marine biodiversity areas. New activities (including structures) will be required to avoid any effects on the values and characteristics of these areas – effectively a high test, which should ensure that the risk of cumulative effects of structures are avoided in these 'sensitive' areas. Additionally, the new plan will also contain 'development' zones (such as mooring zones, aquaculture zones and port/wharf zones) as well as 'overlays' of regionally significant anchorage areas. Certain types of development/structures will be encouraged in these areas and other types/forms of structures will be 'discouraged' through policies and rules. This will also help minimise the risk of cumulative effects from structures occurring.

Maximise certainty of tenure for existing structure owners in coastal commercial zone.

This objective was considered in recognition of the significant financial investment behind established structures in the coastal commercial zone (existing port and wharf zones) and the positive effects that port and wharf related activities generate for the local economy. The objective was however discounted because the measure would be the same as the measure for the objective of 'minimising regulatory costs to structure owners' and the outcome would also end up being the same (that is, there would be no difference in score between the two objectives).

8.4.6 Evaluating the management options

High level objective and measure	Zone/structure type	Option A:	Option B:	Option C:	Option D:
Maximise certainty and minimise regulatory costs. *Measure:* Resource consent activity status and cost: 1 = non-complying (typically limited or fully notified) = $3144. Very low certainty 2 = discretionary (typically non-notified) = $839. 3 = controlled (typically non-notified) = $839. 4 = permitted activity = Maximum certainty and no cost. Note: costs do not include those associated with preparing the application or hearing costs.	General coastal zone	2	1	2	3
	Whangārei City Centre Marine Zone	2	2	3	3
	Renewals in coastal commercial zone	3	2	3	3
	Non-functional	1	1	1	2
	Minor structures	4	3	4	4
	Temporary structures	2	2	4	4
Minimise adverse effects on the environment.		2	3	2	1

High level objective and measure	Zone/structure type	Option A:	Option B:	Option C:	Option D:
Measure: Ability to practicably control adverse effects: 1 = minor control (likely that adverse effects could occur). 2 = moderate control (medium likelihood that adverse effects could occur). 3 = significant control (unlikely that adverse effects could occur). 4 = full control (impossible that adverse effects could occur – structures prohibited).					

Certainty about the evaluation

Overall, we are reasonably confident about the accuracy of the evaluation . We do not think it is necessary to obtain more information to increase the accuracy of our evaluation because additional information is unlikely to change the relative differences between the options. The measure for the first objective is linked directly to the activity status for resource consent applications, while the measure for the second objective is the ability to practically control adverse effects. This ability will likely come down to a case-by-case basis and be determined by consent officers at the resource consent application stage.

Time-frame of the evaluation

The evaluation is for the life-time of the plan (10-15 years).

The preferred management option

The preferred management option for the Proposed Regional Plan is Option C (medium regulatory approach) because, overall, it best fulfills the high level objectives.

Option C scored the second best (slightly behind option D) against the first objective and also ranked second equal against the last objective. Note that option D only has two activities that are slightly more permissive than Option C (only one would be likely to have a lower application fee). This illustrates that there is very little difference between these two options with regards to scoring against the first objective.

Although it did not score the highest against the second objective, it scored better than option D (which would have a controlled activity status for general structures). Overall, option D is considered too permissive, and greater weight has been afforded to the second objective, which is why option C is the preferred option.

The next best option (assessed against the high level objectives) is Option D – light regulatory approach. This scored the highest against the first objective (being the most permissive approach) but scored worst against the last objective. This is because all new general structures would be a controlled activity under this option (meaning that consent has to be granted). The council's ability to practically control adverse effects on other users of the coastal marine area under this option would therefore be low and there would be a greater chance (relative to the other options) of adverse effects occurring.

Option A (retaining the existing provisions in the Regional Coastal Plan) is not the preferred option because it did not score the highest against any objectives. The main reason why it is not the preferred option is that it is more restrictive than the preferred option (has more activities requiring resource consent). Similarly, Option B (stronger regulatory approach) is not

the preferred option because it would not 'enable' development to the extent other options would. The trade-off, however, is that this is the best option with regards to achieving the last objective because it has the greatest level of control over use and development in the coastal marine area – no permitted activities.

8.5 Anchorages and anchoring

8.5.1 Executive summary

The purpose of this report is to evaluate options for managing anchoring and anchorages through the new regional plan.

Anchorages

The ability to find a sheltered place to anchor is integral to a safe and enjoying boating experience. This may be for a couple of hours to enjoy lunch or a swim, anchoring overnight while on a cruising holiday or sheltering for a few days while a storm blows through. Whatever the situation, people are likely to seek a place with suitable depth, with good holding and good shelter from wind and swell. Areas of the coast with these qualities are often also desirable for other activities like moorings and aquaculture.

As such, the council recognises that it is import to retain areas for vessels to anchor. This report assesses three options for managing the use of coastal space in areas that are important for anchoring. It recommends that Regionally Significant Anchorages are mapped in the new regional plan and that Regionally Significant Anchorages and otherrecognised anchorages supported by the following management approach

Structures in areas used for anchoring	Key policy approach
• In Regionally Significant Anchorages – non-complying activity. • The presence of a recognised anchorage has no bearing on the activity status for a structure however the placement of a new structure is generally a discretionary activity.	• Avoid structures that would adversely affect the ability of vessels to anchor in Regionally Significant Anchorages. • Recognise the significance of other anchorages recorded in cruising guides to the boating community

Anchoring period

From time to time vessels are anchored in one location on a semi-permanent to permanent basis. Anchoring in one place for long periods of time excludes other members of the public from using that space and increases the risk of illegal sewage discharges. This report assesses four options to manage these issues, which range from no regulation to requiring resource consent. The preferred option to manage this issue is to retain the current approach (in the Regional Coastal Plan), but with improved clarity about where the rule applies . It also introduces an 'open season' in our most popular cruising areas to provide for and encourage cruising tourism.

Anchoring in anchorage areas
• Vessels anchoring in the outer Bay of Islands and outer Whangaroa Harbour during the peak cruising season - Permitted activity • All other areas and Outer Bay of Islands and Outer Whangaroa Harbour outside peak cruising season – permitted up to 14 days in a harbour or estuary.

Sewage discharges

The discharge of sewage to the coastal marine area (CMA) from vessels can have adverse effects on water quality and the health of people swimming and collecting food in areas where sewage is discharged. The Resource Management (Marine Pollution) Regulations 1998 and the Regional Coastal Plan currently prohibit the discharge of untreated sewage from vessels in most harbours and bays in Northland. This means untreated sewage must either be pumped out for treatment on shore or discharged in open waters (that is, waters greater than 5m depth and 500m from shore).

The preferred option for managing sewage discharges from anchored vessels is summarised in the following table.

Anchoring in anchorage areas	Key policy approach
Vessels that are used for overnight stays certain mapped areas must; • Have a holding tank and stay for no longer than 10 nights without navigating to the open sea to discharge sewage or pump sewage onshore for treatment, or • Have a sewage treatment system on-board and not discharge sewage within 200m of a marine farm. • For vessels carrying less than 49 people, increase the distance from shore that they can discharge untreated sewage from 500m to 1000m in the Bay of Islands. • For vessels certified to carry more than 49 passengers in the Bay of Islands, staff must use a pump out facility or discharge outside the harbour limit.	• Avoid adverse effects of sewage discharges from vessels on human health and other activities in the coastal marine area by; • treating effluent prior to discharge; and • storing effluent.

8.5.2 Relevant provisions

This section is the evaluation supporting the following Regional Plan provisions:

- Policy D.5.11- Regionally Significant Anchorages
- Policy D.5.12 - Recognised Anchorages
- Rules C.1.2.1 - Vessels not underway- Permitted Activity
- Rule C.1.2.2 - Vessels - Sewage management -Permitted Activity
- Rules C.1.2.10- Vessels not underway and sewage management- Discretionary Activity

8.5.3 The problem, opportunity and/or requirement

The council identified three major issues associated with the management of anchoring and anchorages in Northland;

1) Loss of anchoring space and the associated effects on recreation and safety;
2) The occupation of space by anchoring vessels, particularly long term occupation; and
3) The discharge of sewage from vessels;
   a) effecting water quality and human health, and
   b) the difficulty in enforcing the rules in the operative Regional Coastal Plan for Northland [10]

Anchorages

The Regional Coastal Plan recognises that there is competition for sheltered coastal waters for anchoring and contains policies and methods for identifying areas regularly used for anchoring – this was never implemented.

The council recently worked with Yachting New Zealand and Yachting Northland to identify important anchorages in Northland. The purpose of the work was to better understand the impact that activities, such as the placement of moorings, have had on boating in the region and to guide policy in the new plan. The report identifies two types of anchorages:

- *Storm anchorages*: strategic anchorages heavily relied on during bad weather – also popular in times of lighter winds.

10 *Regional Council, 2014, Regional plans review – topic summary – Use and allocation of coastal water space.*

- *Recreation anchorages*: places commonly used for anchoring, suitable for overnight anchoring in the right conditions but are generally not suitable for anchoring during storm conditions. In terms of popularity, the number of boats in recreational anchorages vary from a few in small bays to many boats in a larger bays.

Discussions with the boating public over the last few years indicated that there is concern that the are fewer places to anchor than there used to be because moorings are being placed in bays that had previously been used for anchoring. Vessels can not anchor within the swing radius of a mooring because the vessels may colide. To understand the scale of this issue , staff undertook a review of resource consents issued in bays identified as being regularly used for anchoring in storm conditions. Since 2004, 68 resource consents for moorings have been granted. The most affected bays have lost up to 20% of the anchoring space to moorings since 2004 .

The same exercise was undertaken in bays identified as being particularly important recreation anchorages. The work revealed that 28 moorings have been granted resource consent in important recreational anchorages within the last 10 years. The greatest pressure is in the sheltered bays along the eastern Bay of Islands mainland.

The outer islands, in the Bay of Islands, which are one of the most prized boating areas and contain several highly valued anchorages are largely free of moorings and structures.

In 2017 the council and Yachting New Zealand ran a series of workshops with boating and yachting clubs to identify storm and recreational anchorages that could be identified in the new regional plan. Twenty two locations were identified.

Sewage discharges

The discharge of sewage to the coastal marine area (CMA) from vessels can have adverse effects on water quality and human health. The Resource Management (Marine Pollution) Regulations 1998 and the Regional Coastal Plan currently prohibit the discharge of untreated sewage from vessels in most harbours and bays in Northland. This means untreated sewage must either be pumped out for treatment on shore or discharged in open waters (that is, waters greater than 5m depth and 500m from shore).

The Resource Management (Marine Pollution) Regulations 1998 contain the rules for managing sewage discharges in New Zealand. However regional councils can include more stringent rules in coastal plans as regards increased minimum depth or minimum distance from shore set out in the regulations.

The council is charged with enforcing the Resource Management (Marine Pollution) Regulations and regional rules. Enforcing sewage discharge rules has been difficult. Generally speaking, people have to be caught in the act for the council to have the level of proof required to take enforcement action. Given the large number of vessels in Northland at any one time it is not practicable for the council to actively monitor vessels for illegal discharges. Council's current approach has been to focus on education and to respond to complaints.

Long term anchoring

Another issue that arises from time to time is people anchoring vessels in one location for a long period of time. While the complaints generally arise because of concerns about sewage discharges or visual amenity, this type of behaviour does raise some issues in terms of fairness and equitable use of public water space. Anchoring in one place for long periods of time excludes other members of the public from using that space. Permanent anchoring is not a widespread issue. It is most common in the upper Whangārei Harbour and also occurs in other sheltered locations near townships like Ōpua.

The occupation of space by vessels is discussed in Hauraki District Court versus Moulton (C038/97). A key finding of this case was that a vessel can be considered a structure and therefore is required to have resource consent to occupy space in the coastal marine area, if it is fixed to land and it occupies a site for a period of time that is more than temporary.

Where a vessel is anchored in one location temporarily, the Marine and Coastal Area (Takutai Moana) Act 2011, provides for a public right of navigation including and the right to remain in one place temporarily. The operative Regional Coastal Plan permits vessels to remain at anchor for up to 14 consecutive days. However any vessel remaining in one location longer than 14 days requires resource consent. This is because the vessel excludes the general public from using the public space and that the occupation of space is no longer temporary.

The council's operative anchoring provisions were recently tested in court [11]. The case highlighted that the current 14 day rule should be improved to provide more certainty to people, particularly around where the rule applies, what constitutes 14 days, and when people can re-anchor in the same area. [12].

8.5.4 Management options

This section summarises the management options for anchoring and the management of anchorages. The management options have been grouped as follows:

- Options for managing the potential impacts of structures on Regionally Significant Anchorages; and
- Options for managing sewage discharges from vessels; and
- Options for managing the effects of anchored vessels – equitable use of public space

The intention is not to identify every different combination of approach as there would be many, but to represent the range of options and highlight key differences in approaches.

Managing anchorages

Option A: status quo – policy based approach

This option reflects the current management approach in the Regional Council Plan. It utilises discretionary activity statusand includes policies advocating for the protection of places regularly used for anchoring . It does not specify if any level of effect is acceptable or define the types of development that are acceptable/unacceptable .

Structures in anchorage areas	Are anchorages mapped?	Key policy approach
Generally a discretionary activity	No	Protect areas regularly used for anchoring from development.

Option B: alternative policy based approach

This option is centred around discretionary activity status for structures in places regularly used for anchoring. Decisions on these resource consents are directed by policy that requires significant adverse effects to be avoided.

Under this option anchorages are not mapped.

Structures in anchorage areas	Are anchorages mapped?	Key policy approach
Discretionary activity	No	• Avoid significant effects on the ability of vessels to shelter from storm conditions. • Avoid significant effects on the ability of vessels to anchor for recreational reasons.

Option C: zone-based approach

This option provides strong protection for anchorages with provisions in place to discourage <*is this the right word*> structures being constructed within identified anchorage areas. It is a zone-based approach as summarised in the following table/

11 *Northland Regional Council v Philbrick (ENV-2014-AKL-227)*

12 *Ibid.*

Structures in anchorage areas	Anchorages mapped?	Key policy approach
• In Regionally Significant Anchorages– non-complying activity. • In other regularly used anchorages – discretionary activity.	Regionally Significant Anchorages - Yes Other regularly used anchorages - no (identified through cruising guides	• Avoid structures that would adversely affect the ability of vessels to anchor in storm anchorages. • Recognise the value of retaining these places to anchor.

Sewage discharges from anchored vessels

Regional councils are responsible for managing discharges to the coastal marine area, including the discharge of sewage[13].

The options below are consistent with or build on the Resource Management (Marine Pollution) Regulations. The Regulations set minimum standards and distances from shore, for discharging sewage from vessels. [14] . While the regulations are the primary tool controlling sewage discharges from vessels regional councils can introduce provisions that are more restrictive than the regulations. [15].

Option D: status quo

This option is to retain the current approach in the Regional Coastal Plan. It is more restrictive than the Resource Management (Marine Pollution) Regulations 1998 as it prohibits the discharge of untreated sewage in most of Northlands Harbours and estuaries . The option is summarised in the following table.

Anchoring in anchorage areas	Key policy approach
• Discharge of untreated sewage within all harbours except Kaipara Harbour – prohibited activity.	• Prevent the adverse effects of long-term anchorage of vessels, including potential for the proliferation of permanent anchoring throughout Northland.

Option E: require sewage treatment or storage

This option is to require vessels to store sewage or treat it to an acceptable standard before discharging it to the coastal marine area in It also involves a greater setback distancefor discharges of A grade treated set out in the Resource Management (marine pollution) Regulations, 1998.

Note that this is the current regulatory approach for vessels in mooring zones (on a mooring or anchored). However, this option extends it to to cover the coastal marine area generally . The option is summarised in the following table.

Anchoring in anchorage areas	Key policy approach
Rules requiring that occupants staying overnight on a vessel in the identified sewage exclusion zones; 1) Have a holding tank and stay for no longer than 10 nights or more without having navigated to open sea to discharge or that they have used a pump out facility, or 2) Have a sewage treatment system and do not discharge within 200m from a marine farm.	• Maintain coastal water quality. • Use the best available treatment technology for waste water discharges.

13 *Section 30, Functions of regional councils under this Act, Resource Management Act 1991.*
14 *Regulations 11,12,12A and 16, Resource Management (marine pollution) Regulations 1998.*
15 *Regulation 11 Regional rules or resource consents for discharges, Resource Management (marine pollution) Regulations 1998.*

Option F: no rules in the new plan

This option is to not include rules or policy on the discharge of sewage from vessels. The council would just enforce the Resource Management (Marine Pollution) Regulations 1998.

Anchoring in anchorage areas	Key policy approach
No rules	No policy

Anchoring period

Option G: encourage temporary anchoring (status quo)

This option retain the current management approach in the Regional Coastal Plan. It encourages temporary anchoring through the use of the permitted activity status but limits duration a vessels can stay in one location to 14 days. A recent environment court case tested this approach and found it to be sound. The judge also highlighted that the wording of the rule in the operative Coastal Plan could be improved.[16]. If this option is carried through to the new plan these issues would need to be addressed.

Anchoring in anchorage areas	Key policy approach
Vessels can anchor in one location for up to 14 consecutive days – permitted activity.	• The council shall, as far as practicable, prevent the adverse effects of long-term anchorage of vessels including potential for the proliferation of permanent anchoring throughout Northland. • To avoid, remedy or mitigate the adverse effects of long-term anchorage of vessels.

Option H: no time limit on anchoring

Under this option the regional plan would not regulate the length of time that vessels can anchor and occupy space in the coastal marine area. Council would only intervene where the vessel is deemed to be a structure and therefore requires resource consent. The circumstances in which a vessel can be considered a strucutre are set out in Hauraki District Council v Moulton, C 38/97.

Anchoring in anchorage areas	Key policy approach
No rules limiting how long a vessel can occupy one location.	No policy on the occupation of space by anchored vessels. Sewage rules and policy would apply.

Option I: tiered approach

This option recognises that Northland is a popular cruising destination and seeks to provide for this activity. It also recognises that council receives complaints each year about vessels being anchored on a permanent basis and seeks to put mechanisms in place to manage these effects.

This option was suggested by the Regional Harbourmaster, who is keen to encourage sailing tourism but also recognises that controls are needed to provide for equitable use of public space. Vessels staying longer than 14 days would also need to demonstrate that they can adequately manage rubbish, sewage and any other discharges as part of their resource consent.

16 *Northland Regional Council versus Phibrick ENV-2014-AKL-227.*

Anchoring in anchorage areas	Key policy approach
Vessels anchor in one area for up to 14 consecutive days – permitted activity. Vessels anchoring in one area for up to six months – controlled activity (fast track resource consent).	• Policy would encourage cruising tourism and particularly vessels seeking to stay in the region for several months by consenting vessels to occupy space for up to 6 months, but will discourage permanent occupation of coastal space.

Option J: open season for cruising

This option is similar to Option I above. It provides for temporary anchoring up to 14 days and also provides for longer term anchoring in areas that are popular for sailing holidays with condition to mitigate adverse effects. It proposes an open season in our most popular cruising [17] for anchoring destinations over the peak cruising season. Outside the peak cruising season a 14 day limit for anchoring in a harbour or estuary applies.

Anchoring in anchorage areas	Key policy approach
Vessels anchoring the outer Bay of Islands and outer Whangaroa Harbour during the peak cruising season – permitted activity. All other areas and in the outer Bay of Islands and outer Whanagroa Harbour outside peak cruising season – permitted activity up to 14 days in a harbour or estuary	• Policy would encourage cruising tourism and particularly vessels seeking to stay in the region for several months by taking a permissive approach to vessels occupying space for up to 5 months, but will discourage permanent occupation of coastal space.

8.5.5 High level objectives and measures

Section 32 of the RMA requires an assessment of *"...the efficiency and effectiveness of the provisions in achieving the objectives..."*. Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section Evaluation approach for more details.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. They signal a direction for where we want to head, without stating how far we go. Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against. The measures below give a low score to poor performance against an objective and a higher score where the better performance is expected.

High level objective	Measure
Minimise loss of water space in regionally significant anchorages.	Likelihood of other activities excluding anchoring in recreational and storm anchorages: 1 = significant loss over time. 2 = moderate loss of space over time. 3 = minor loss of space over time. 4 = existing anchorage areas are maintained.

17 *for the purpose of this report cruising refers the act of undertaking a sailing holiday*

High level objective	Measure
	5 = existing anchorage space is available plus some reclaimed space.
Minimise development opportunity costs.	This is a measure of the opportunity costs that could occur as a result of restrictions. It is a constructed measure on how benefits of development are considered when compared to adverse impacts on Regionally Significant Anchorages. 1 = no ability to erect structures within an anchorage. 2 = opportunity to apply to erect structures, but significant weight given to retaining the area for anchoring . 3 = opportunity to apply to erect structures in an anchorage, with moderate weight given to retaining the area for anchoring. 4 = opportunity to apply to to erect structures within anchorages. 5 = no additional constraint on the ability to erect structures within anchorages.
Minimise the risk of unlawful sewage discharges.	Likelihood of an unlawful sewerage discharge occurring from anchored vessels: 1 = ongoing discharges are likely. 2 = intermittent discharges are likely. 3 = discharge is unlikely. 4 = discharge is very unlikely.
Minimise constraints on recreational boating	Financial cost or level of behavioural change required to comply 1 = significant behavioural change required or a cost of more than $200.

Explanation for the high level objectives and measures

Minimise the loss of water space for anchoring in regionally significant anchorages

High quality anchorages are one of the draw cards that attract cruising vessels to Northland. They can also be the places that vessels take shelter when conditions get rough. This outcome seeks to minimise the amount of space that is lost to development to ensure that space in important anchorages is available for anchoring.

The measures assess the likelihood of structures being allowed in Regionally Significant Anchorages and other regularly used anchorages during the life of the proposed plan (10 years). Structures on the surface physically stop vessels from anchoring and structures on the sea bed make it unsafe to anchor due to the risk of snagging or entangling an anchor.

The measures range from 1 where there has been a significant loss of space for anchoring leaving the anchorage anchoring because structures have been allowed A score of three would be awarded where it is expected that the option would result in up to 20% of a bay being rendered unsuitable for anchoring. A score of 4 would be awarded where the exiting anchoring

space has a high level of protection and is therefore highly likely to be retained for anchoring. A score of 5 would be awarded where an anchorage has a high level of protection (smilar to a score of 4) and where additional anchoring space will be created by removing structures e.g. jetties.

Opportunity costs are minimised

This objective seeks to keep options open to develop in anchorages .

The measure for this objective seek to assess the costs associated with not being able to undertake an opportunity because it is precluded by the Regional Plan. Where an option is highly restrictive on the construction of structures in an anchorage the *opportunity costs* is high because the structure can not be built. Conversely if structures can be built in an anchorage with limited bureaucracy the opportunity costs will be low.

In this case the activities that are most likely to be effected are new moorings and aquaculture.

Minimise the risk of untreated sewage discharges inside marine pollution boundaries

This objective seeks to limit the risks to human health and economic well-being of marine farms from the discharge of untreated sewage.

For this objective a score of 1 would be given where the controls that are put in place are unlikely to be complied with by the resource user and council is unable to monitor and enforce them. A moderate score of 3 would be given where the majority of resource users comply with the provisions but some will continue to discharge from time to time. A high score of 4 will be given where there is likely to be strong buy-in by the resource users resulting in a very low risk of discharge.

Minimise constraints on recreational boating

This objective recognises that some of the options suggested will require behavioural changes or will require boat owners to buy items to comply with the suggested provisions. It seeks to assess minimise the changes that boaties need to make in order to comply with the option.

The measures assess the different level of cost or effort required by people to comply with an option. A low score equates to a high level of effort or cost and a high score equates to little to no change from current practises.

High level objectives not included

Section 32 requires an assessment of the impacts on economic growth and employment opportunities (s32(2)(a)). However, the impact of the management options on economic growth and employment opportunities cannot be determined with any confidence. Therefore economic growth and employment opportunities have not been included as high level objectives. For more information go to the section *1.7 'Assessing impacts on economic growth and employment opportunities'*.

8.5.6 Evaluating the management options

Anchorages

High level objective and measure	Option A: status quo	Option B: criteria-based approach	Option C: zone-based approach
Minimise loss of water space in Regionally Significant Anchorages and other anchorages. *Measure:* Likelihood of other activities excluding anchoring in Significant Anchorages and other anchorages	2	2-3	Recreational = 3; storm = 4.

High level objective and measure	Option A: status quo	Option B: criteria-based approach	Option C: zone-based approach
1 = significant loss over time. 2 = moderate loss of space over time. 3 = minor loss of space over time. 4 = existing anchorage areas are maintained. 5 = existing anchorage space is available plus some reclaimed space.			
Opportunity costs are minimised. *Measure:* 1 = no ability to erect structures within an anchorage. 2 = opportunity to apply to erect structures, but significant weight given to retaining the area for anchoring. 3 = opportunity to apply to erect structures in an anchorage, with moderate weight given to retaining the area for anchoring. 4 = opportunity to apply to to erect structures within anchorages. 5 = no additional constraint on the ability to erect structures within anchorages.	5	3	Recreational = 3; storm = 2.

Sewage discharges

High level objective and measure	Option D: status quo	Option E: require treatment or storage	Option F:No controls in plan
Minimise the risk of unlawful sewage discharges *Measure:* Likelihood of an unlawful sewage discharge occurring from anchored vessels: 1 = ongoing discharges are likely. 2 = intermittent discharges are likely. 3 = discharge is unlikely. 4 = discharge is very unlikely.	2	3	2
Minimise constraints on recreational boating Financial cost or level of behavioural change required to comply:	5	4	5

High level objective and measure	Option D: status quo	Option E: require treatment or storage	Option F:No controls in plan
1 = significant behavioural change required or a cost of more than $200. 3 = some behavioural change required/financial cost less than $200. 5 = very little additional effort/no cost required to comply.			

Use of public space

High level objective and measure	Option G: status quo	Option H: no time limit	Option I: tiered approach	Option J: open season
Minimise constraints on recreational boating. Financial cost or level of behavioural change required to comply: 1 = significant behavioural change required or a cost of more than $200. 3 = some behavioural change required/financial cost less than $200. 5 = very little additional effort/no cost required to comply.	5	5	1	5

Certainty about the evaluation

Overall we are confident about the accuracy of the evaluation for all the options. We do not think it is worthwhile to get more information to increase the accuracy of our evaluation as it is very unlikely to change the relative differences between the options.

Time-frame of the evaluation

The evaluation is made for the life-time of the plan (10-15 years).

The preferred management options

The preferred options for managing anchorages is Option C. That is, to create zones to Regionally Significant Anchorages and to include policy in the new plan that directs decision-makers to recognise the benefits of other regularly used anchorages. The option strikes a balance between allowing some development within anchorages, while protecting the recreational resource and ensuring there are sufficient safe places for vessels to shelter during storm conditions.

The preferred management option for sewage disposal is Option E, which requires people staying overnight on vessels to have measures in place to store or otherwise treat sewage and then to dispose of it properly. This is the preferred option because it better allows council to monitor and enforce sewage discharges with only minor changes in behaviour required from people . Options D and E both have a total score of 7 . More weight was given to the extent to which option will minimise sewage discharges to coastal waters. Option E is the preferred option because it is likely to achieve the highest level of mitigation.

The preferred option for managing the use of public space is to retain the existing rule with better definition around where the rule applies and an exemption for the outer Bay of Islands and outer Whangaroa Harbour over the peak cruising period (Option J) . It is worth noting that Option I, which provides a fast-track consenting regime for vessels seeking to occupy a location for two weeks to six months also scored highly across many of the objectives and would complement the preferred treatment option.

8.6 Aquaculture

8.6.1 Executive summary

This section evaluates the options for managing aquaculture in the new regional plan. Aquaculture has particular biophysical and locational needs, such as adequate nutrients, high water quality, proximity to servicing facilities, sheltered sea conditions and adequate water temperature and depth for example. Some of these requirements are common to all types of aquaculture, while others depend on the type of species farmed and farming method. Additionally, aquaculture is one of several competing activities in some parts of the coastal marine area. Aquaculture can have many positive benefits (e.g. providing jobs) but can cause adverse effects, including cumulative effects, on other processes, values and uses of the coastal environment.

The New Zealand Coastal Policy Statement 2010 has strong direction on the the management of aquaculture, including requiring decision-makers to recognise the benefits of aquaculture and provide for it in appropriate places. The coastal policy statement also requires that adverse effects on outstanding natural character, outstanding natural features and landscapes and areas of significant marine biodiversity are avoided.

New regional coastal plan provisions for aquaculture in Northland have only recently been made operative, and there is likely to be concern from those involved in developing these provisions about opening these back up for re-litigation so soon. The regional council, submitters and appellants invested considerable time and money in developing Plan Change 4 to the Regional Coastal Plan (Plan Change 4) which was made operative on 9 May 2016.

The council assessed seven management options for regulating aquaculture - ranging from a very permissive to very restrictive approaches - against several high level objectives, which recognise:

- aquaculture's economic and employment opportunities
- aquaculture potential impacts on significant environmental values, and
- people's investment in Plan Change 4

Our preferred management approach is Option B - which is retain the the main elements of Plan Change 4 (in particular the areas where aquaculture is prohibited), albeit with some amendments to:

- account for new information,
- fit the structure of the new plan,
- allow potential for small extensions and realignment of existing aquaculture in outstanding [18] and significant areas [19]
- allow potential for small scale and short term aquaculture in outstanding and significant areas.

Option B is summarised in the following table:

18 *These are the outstanding or nationally significant areas described in policies 11(a), 13(1)(a),15(a) and 16(b) of the New Zealand Coastal Policy Statement 2010. These policies state that adverse effects on certain matters must be avoided.*

19 *These are areas that have significant uses and values that are likely to conflict with aquaculture. These are described in policy 27.4.6 of Plan Change 4 and cover matters not addressed by policies 11(a), 13(1)(a) and 15(a) of the New Zealand Coastal Policy Statement 2010 and include: significant tourism and/or recreation areas, recognised navigation routes, recognised anchorages, port and harbour approaches, and existing areas of aquaculture at production or ecological carrying capacity.*

New aquaculture	Re-consenting	Extensions and realignments	Small scale and short term aquaculture	Key policy approach
Outstanding and significant areas = prohibited activity[1]. Everywhere else = discretionary activity.	Shellfish in outstanding areas = restricted discretionary activity. Shellfish outside outstanding areas = controlled activity. Finfish = discretionary activity	Extensions in outstanding and significant areas = discretionary activity. Extensions everywhere else = restricted discretionary activity. Realignment = restricted discretionary activity.	Outstanding and significant areas = non-complying activity Everywhere else = discretionary activity.	• Sets out a hierarchy of acceptable effects from aquaculture on various coastal uses and values. • Recognise particular benefits of aquaculture.

[1]There are some minor exceptions - marae-based aquaculture (small-scale and for customary purposes), aquaculture in Māori oyster reserves (designated areas under fisheries legislation) and relocation of some farms in Pārengarenga Harbour.

Option B is our preferred option because it strikes the best balance between:

- recognising the investment the regional council and appellants have put into Plan Change 4 ,
- providing opportunities for the aquaculture industry to optimise their current space and infrastructure,
- providing opportunities to test new technologies, methods and species,
- limiting the potential for environmental impacts on the values of significant areas, and
- providing certainty to the community that commercial scale aquaculture is not allowable in significant and outstanding areas.

8.6.2 Relevant provisions

This section is the evaluation supporting the following Regional Plan provisions:

- Rules C.1.3 - Aquaculture
- Policy - D.5.1 Aquaculture – benefits
- Policy - D.5.2 Aquaculture – avoiding adverse effects
- Policy - D.5.3 Aquaculture – avoiding significant adverse effects
- Policy - D.5.4 Aquaculture – general matters
- Policy - D.5.5 Aquaculture – staged development
- Policy - D.5.6 Aquaculture – abandoned or derelict farms

8.6.3 The problem, opportunity and/or requirement

Background

Aquaculture is the farming of aquatic organisms. Most aquaculture in New Zealand is done in the sea. The main commercial species farmed in New Zealand are green lipped mussels, pacific oysters and salmon. Green lipped mussels are grown on lines suspended from floats on the surface, while pacific oysters are grown on intertidal racks. Other species farmed include paua, snapper and kingfish.

There is approximately 850 hectares of approved aquaculture area within the coastal marine area of Northland. Around 700 hectares is used for oyster farms and 150 hectares for mussel farms. There is no definitive data on how much of the approved area has been developed. The majority of oyster farms are located in Whangaroa, Bay of Islands, Houhora, Kaipara and Pārengarenga harbours. There is a group of mussel farms in Houhora Bay (just north of Houhora Harbour) and a resource consent has recently been granted for a large mussel farm in the lee of Stephenson's Islands, Whangaroa. In addition to aquaculture activities, mussel spat is collected from seaweed at Ninety Mile Beach (Te Oneroa-a-Tōhe), which supplies more than 75% of seed to mussel farms throughout New Zealand.

Aquaculture is currently a relatively small industry in Northland. In 2010 it was estimated that oyster farming and processing directly contribute $19 million to regional income and provided 336 full time jobs[20]. Compare this to the forestry industry which was estimated to contribute $255 million to regional income in 2013 [21].

Estimated exports for Northland aquaculture declined from $101 million in 2008 to close to $38 million in 2013. The decline was largely a result of the oyster virus OsHV-1. In 2010 up to 80% of juvenile oysters on some farms were lost. The value of seafood processing in the region fell from $20 million in 2008 to $11 million in 2013. However the industry has bounced back, and in 2015 the export earning were $19.6 million, eclipsing the the previous high of $18.1 million earned in 2006[22].

Growth potential

In Northland the aquaculture industry is generally positive about its prospects, having established an ambitious strategy for growth in 2012[23]. Its goal is to double the value of oyster and pāua production, increase greenshell mussel production twenty-fold, and to develop kingfish into a major industry by 2030 . The potential for shellfish aquaculture other than oyster and mussel has also been explored (for example, Geoduck).

The Tai Tokerau Northland Growth Strategy 2015 identifies that there is potential for king fish farming in Northland and increased oyster and mussel production. The strategy suggests regulation (which include the rules in the current Regional Coastal Plan) is a key constraint to the development of aquaculture in Northland.

Aquaculture has the potential to be an increasingly important contributor to the social, economic, and cultural well-being and health of Northland, especially in the more remote parts of the region. The New Zealand Coastal Policy Statement 2010 (coastal policy statement) requires councils to recognise the benefits of aquaculture and directs regional councils to include provisions in regional plans that provide for aquaculture in appropriate places (Policy 8, New Zealand Coastal Policy Statement 2010).

Adverse effects

Aquaculture is one of many industries in Northland that rely on the coastal marine area. However, it generally requires the exclusive use of large areas and has the potential to impact significantly on a range of uses and values.

Aquaculture can be adversely affected by adjoining coastal uses and is particularly susceptible diffuse and point source discharges of contaminants. The coastal policy statement stipulates that development in the coastal environment must not make water quality unfit for aquaculture activities (Policy 8, New Zealand Coastal Policy Statement 2010).

Reconsenting

A key issue for the existing aquaculture industry is certainty around re-consenting, realigning and extending existing farms [24]. The aquaculture industry's preference is for these to be controlled activities. However, the aquaculture industry accepts that it would be difficult to justify re-consenting, realigning and extending existing farms as controlled activities in outstanding areas [25], and therefore would accept a restricted discretionary activity status. This was the position negotiated between the parties for the Auckland Unitary Plan and what ended up in the operative Auckland Unitary Plan. Restricted discretionary is also the consent status proposed for re-consenting in the Proposed National Environmental Standard for Aquaculture.

20 *See Enveco. 2010. The Northland Regional Economic Impacts of Aquaculture. Prepared for Northland Regional Council.*
21 *Ministry for Primary Industries, 2015. Tai Tokerau Northland Growth Study: Opportunities Report*
22 *New highs for oysters, Aquaculture New Zealand magazine, June 2016)*
23 *Northland Aquaculture Development Group, 2012. Northland Aquaculture Development Strategy*
24 *For example, see Aquaculture New Zealand's feedback on the draft Regional Plan*
25 *The areas the New Zealand Coastal Policy Statement states that adverse effects must be avoided, for example, Policy 11(a)*

A key challenge is justifying aquaculture (particularly existing) in or close to 'outstanding areas' given the Supreme Court decision on King Salmon's proposals to establish salmon farms in the Marlborough Sounds (*Environmental Defence Society versus New Zealand King Salmon Company Ltd.)*. This decision confirmed that the New Zealand Coastal Policy Statement's requirement to avoid adverse effect on these outstanding values must be given effect to as an absolute bottom line. In practical terms, this means it will be very difficult to justify aquaculture renewals and extensions (in particular) in outstanding areas as a controlled activity [(26)] . Classifying activities as controlled activities is effectively saying that the existing activity at that location is generally acceptable. However due to the nature and scale of aquaculture, there is a reasonable likelihood that it could have adverse effects on the values of the outstanding areas, and therefore wouldn't be giving effect to the New Zealand Coastal Policy Statement.

Plan change 4

Plan Change 4 (Aquaculture) to the Regional Coastal Plan identifies areas where aquaculture is prohibited and a suite of policies directing how resource consent applications for aquaculture outside prohibited areas should be considered (Refer to Appendix 2 for more information about the plan change). The prohibited areas are extensive and apply to nearly all types of aquaculture[(27)] . The regional council, submitters and appellants invested a lot of time and money in the plan change and it was only made operative on 9 May 201 . Consequently any departure from Plan Change 4 will likely result in significant concerns from at least some of the parties involved in that process - particularly any decrease in the extent of the areas where new aquaculture is prohibited and if there are any further exceptions to the prohibition.

Notably, the aquaculture industry was not well represented through the appeals process on Plan Change 4. Sanfords and Aotearoa Fisheries Ltd were involved in the initial Environment Court meditations but subsequently pulled out. The only pro-aquaculture parties involved in the court hearings were a couple of iwi and hapu groups. This meant the Environment Court was not presented with as much evidence from the aquaculture industry's perspective as it may have otherwise received, which may have influenced the final outcome.

Existing marine farms - zones

There are currently around 30 existing marine farms that are not located within aquaculture areas (zones) in the operative Regional Coastal Plan (most are located within Marine 2 Management Areas and some in Marine 1 Management Areas). These 30 marine farms were granted resource consent after the original coastal plan was notified (1994) and it was not within the scope of Plan Change 4 to add aquaculture zones around existing farms . All of these marine farms are consented but their consents will expire in either 2020 or 2025.

Marae-based aquaculture

The operative Regional Coastal Plan (via Plan Change 4) includes provisions for Marae-based aquaculture (small non-commercial aquaculture for the purposes of improving traditional kaimoana (seafood) provision for marae). Marae-based aquaculture is a non-complying activity in areas that would otherwise be prohibited. The Te Tai Tokerau Māori Advisory Committee [(28)] think that this is unnecessarily restrictive and that it should be a discretionary or restricted discretionary activity in all areas.

Proposed National Environmental Standard for Marine Aquaculture

The Ministry for Primary Industries (MPI) released the proposed national environmental standard for marine aquaculture (NES: Marine aquaculture) for feedback in June 2017. An NES is established under the Resource Management Act 1991 (RMA) and sets national rules that replace regional council rules.

The proposed *NES: Marine aquaculture* seeks to:

- provide a more efficient and certain reconsenting process for existing marine farms
- implement a nationally-consistent framework for biosecurity management on all marine farms.

26 RMA, s68A expressly states that aquaculture cannot be a permitted activity.

27 There are some exceptions e.g. marae-based aquaculture and aquaculture in the Kaipara Harbour)

28 Working party meeting notes on the Draft Regional Plan, September - November 2016

The NES: Marine aquaculture will have an impact on the Proposed Regional Plan once it is gazetted (expected to be mid-2018). The NES: Marine aquaculture will essentially trump the rules in the Proposed Regional Plan where the the NES: Marine aquaculture 'rules' are more lenient. While the intention is to enable regional plans to be more lenient, it's not clear whether such rules in the Proposed Regional Plan would fall into this category, because the Proposed Regional Plan was notified before the (planned) gazettal of the NES: Marine aquaculture.

8.6.4 Management options

Relitigating Plan Change 4 (Aquaculture) to the Regional Coastal Plan

Plan Change 4 was only recently been made operative. The obvious question is why redebate plan provisions for aquaculture having only just finished a protracted plan change process? That is, the council could not include policies and rules on aquaculture in the new regional plan and retain Plan Change 4. On balance, we consider that the aquaculture provisions in Plan Change 4 should be included in the new regional plan and subject to challenge because:

- Plan Change 4 was notified for submissions in 2005. The aim is to notify the new regional plan in 2017. By this time it will be 12 years since the public had the opportunity to get involved in the process of how aquaculture should be managed. Since 2005, there have been significant changes to the law that mean Plan Change 4 is now quite different from what it was, when it was notified.
- The RMA requires council to review regional plan provisions every 10 years (s79). As a result of Plan Change 4 the aquaculture provisions do not need to be reviewed until 2026, with the exception of the extent of the aquaculture zones (which Plan Change 4 did not address). We are legally obliged to review the extent of aquaculture zones (they have to be part of the new regional plan). We could just add the new aquaculture zones into the proposed regional plan and not the provisions (and therefore satisfying s79). However by not including the provisions that go with the aquaculture zones, it limits the options for changes to aquaculture zones. In particular, we couldn't consider the option of removing aquaculture zones (an option we think has considerable merit) because the current provisions are designed around having aquaculture zones.
- The prohibited areas are extensive. The aquaculture industry is likely to have concerns with these prohibited areas. Including the Plan Change 4 aquaculture provisions will allow the industry to challenge the extent of the areas and/or the prohibited rule status.
- It would be confusing and complicated having the aquaculture provisions (Plan Change 4) separate from the new regional plan.
- The Plan Change 4 prohibited areas would not be consistent with latest mapped information, particularly outstanding natural character and significant marine biodiversity.
- Some aspects of Plan Change 4 are not consistent with the New Zealand Coastal Policy Statement 2010. In particular, marine farm zones in 'outstanding areas' allow renewals of aquaculture resource consents as a controlled activity, which in some cases may be contrary to the 'avoid adverse effects' requirement of the New Zealand Coastal Policy Statement 2010.

These reasons outweigh the argument for retaining Plan Change 4 (that is, outside the new regional plan), although we acknowledge the potential that people involved in the Plan Change 4 process may have concerns about having to spend time and effort re-litigating it so soon after it was finalised.

Aquaculture management options

In the rest of this section we summarise the management options for aquaculture. The intention is not to identify every different combination of approach, as there would be many, but to represent the range of options and highlight key differences in approaches.

The options are presented by the main types of aquaculture activities – new aquaculture, renewal of resource consent for existing aquaculture, extensions and realignments, small scale and short term aquaculture – and the key policy approach.

Key terms

The following is an explanation of the key terms used to describe the options:

Aquaculture zone

An aquaculture zone, as the name suggests, is a zone where aquaculture is provide for by rules and related activities are a lot less stringent than outside the zone. The operative Regional Coastal Plan has aquaculture zones – called Marine 3 (Aquaculture) Management Areas.

The main benefit of zones is that they provide certainty – particularly for renewals or resource consent. However, the trade-off of the certainty is that they are inflexible – their boundaries are fixed in the plan. This can make it difficult to realign farms and it means that any new farms that subsequently come along do not get the benefits of being in a zone.

Extension

Extension means increasing the size of the farm to a predetermined threshold (for example 25% of the original area).

Finfish

Finfish is short for finfish aquaculture. As the name suggests, finfish are fish with fins, for example, snapper, kingfish and hapuka. Most commonly finfish farming in the sea involves fish being held in a series of nets and being fed.

Significant areas

Significant areas refers to the significant uses and values that are likely to conflict with aquaculture. These are described in policy 27.4.6 of Plan Change 4 and cover matters not addressed by policies 11(a), 13(1)(a) and 15(a) of the New Zealand Coastal Policy Statement 2010 (see *Outstanding areas* below) and include:

- Significant urban areas;
- Significant tourism and/or recreation areas;
- Recognised navigation routes;
- Recognised anchorages;
- Port or harbour approaches; and
- Existing areas of aquaculture at production or ecological carrying capacity.

These areas are mapped in Plan Change 4, and new aquaculture is prohibited in these areas.

Outstanding areas

These are the outstanding or nationally significant areas described in policies 11(a), 13(1)(a),15(a) and 16(b) of the New Zealand Coastal Policy Statement 2010. These policies state that adverse effects on certain matters must be avoided. New aquaculture is prohibited in these areas under Plan Change 4.

Realignment

Realignment refers to moving the farm but with no increase in size. The movement is restricted to the vicinity of the originally approved site (for example, 60% of the farm needs to remain in the original site).

Re-consenting

Re-consenting refers to a new resource consent to replace a resource consent about to expire or lapse.

Shellfish

Shellfish is shorthand for shellfish aquaculture. The most commonly farmed species are pacific oysters and green lipped mussels. Oyster aquaculture is generally undertaken on timber racks in the inter tidal area with the oyster racks attached to sticks or held in a container (for example, bag). Mussel aquaculture is generally done with lengths of line held in place with anchors and suspended by floats. The mussels are hung of the line, often in bags. Shellfish feed off the plankton in the water.

Small scale and short term aquaculture

Small scale and short term aquaculture is aquaculture which is limited by size (e.g. maximum of 1 hectare) and consent duration (e.g. maximum of 5 years). Generally aquaculture of this nature is experimental (e.g. new technology, new species or testing site viability) - it's sometimes referred to as experimental aquaculture.

Option A: Plan Change 4

The first option is to roll-over the provisions of Plan Change 4 (Aquaculture) into the Proposed Regional Plan, with some minor changes to fit the structure of the new plan and to address the implications of the King Salmon case Environmental Defence Society Incorporated v the New Zealand King Salmon Company & Ors [2014] NZSC 38. For more detail on Plan Change 4 refer 14.2 'Appendix 2 - History of Plan Change 4 (Aquaculture) to the Regional Coastal Plan'.

New aquaculture	Re-consenting	Extensions and realignments	Small scale and short term aquaculture	Key policy approach
Outstanding and significant areas = prohibited activity[1]. Everywhere else = discretionary activity.	In aquaculture zones = controlled activity. Everywhere else = discretionary activity.	In outstanding and significant areas = prohibited activity. Everywhere else = discretionary activity.	In outstanding and significant areas = prohibited activity. Everywhere else = discretionary activity.	• Sets out a hierarchy of acceptable effects from aquaculture on various coastal uses and values. • Recognise benefits of aquaculture.

[1]There are some exceptions: marae-based aquaculture (small-scale and for customary purposes), aquaculture in Māori oyster reserves (designated areas under fisheries legislation) and relocation of some farms in Pārengarenga Harbour.

Option B: Extensive prohibited areas but with some exceptions

This option is similar to Option A (Plan Change 4) but is more sympathetic (than Option A) to the aquaculture industry's desire to provide opportunities for growth of the industry, while still maintaining the extensive prohibited areas. Key differences between this option and Option A are:

- It does not have aquaculture zones;
- Under Plan Change 4 (Option A), an application for a replacement consent is a controlled activity (regardless of aquaculture type) in an aquaculture zone and discretionary activity outside. This option differentiates between finfish and shellfish - the rule for finfish under this option (discretionary activity rule) is more stringent than for shellfish (controlled and restricted discretionary activity rule). This is because of the greater risk of adverse effects from finfish than shellfish aquaculture;
- Re-consenting finfish aquaculture is not addressed in Plan Change 4; and
- There are three additional exceptions to the aquaculture prohibited areas rule: a) extensions (discretionary activity), b) small-scale and short term aquaculture (non-complying activity), and c) realignment (restricted discretionary activity). The aquaculture industry have expressed concerns about prohibited areas and how they limit aquaculture. The exceptions provide some flexibility and potential for minor expansion of existing aquaculture.

New aquaculture	Re-consenting	Extensions and realignments	Small scale and short term aquaculture	Key policy approach
Outstanding and significant areas = prohibited activity[2]. Everywhere else = discretionary.	Shellfish in outstanding areas = restricted discretionary activity. Shellfish outside outstanding areas = controlled activity. Finfish = discretionary activity.	Extensions in outstanding and significant areas = discretionary activity. Extensions everywhere else = restricted discretionary activity. Realignment = restricted discretionary activity.	Outstanding and significant areas = non-complying activity. Everywhere else = discretionary activity.	• Sets out a hierarchy of acceptable effects from aquaculture on various coastal uses and values. • Recognise benefits of aquaculture.

[2]There are some exceptions in addition to the others presented in the table: marae-based aquaculture (small-scale and for customary purposes), aquaculture in Māori oyster reserves (designated areas under fisheries legislation) and relocation of some farms in Pārengarenga Harbour.

Option C: No prohibited areas (non-complying)

This approach involves not having prohibited areas and policies and rules that provide more certainty and flexibility for existing aquaculture. It is an approach that Aquaculture NZ is advocating (refer their feedback on the Draft Regional Plan). it is similar to Option B, but the main difference being no prohibited areas (at most non-complying). It is also very similar to the Auckland Unitary Plan approach.

New aquaculture	Re-consenting	Extensions and realignments	Small scale and short term aquaculture	Key policy approach
Outstanding areas = non-complying activity. Everywhere else = discretionary activity.	Shellfish in outstanding areas = restricted-discretionary activity. Shellfish outside outstanding areas = controlled activity. Finfish = restricted-discretionary activity.	Extensions in outstanding and significant areas = discretionary activity. Extensions everywhere else = restricted discretionary. Realignment = restricted discretionary activity.	Discretionary activity.	• Recognise effects of aquaculture on various coastal uses and values. • Acknowledge the existence of existing aquaculture and that it will not always be practicable or appropriate to avoid all adverse effects. • Strong recognition of the benefits of aquaculture.

Option D: Active promotion of aquaculture

This option is the same as Option but also includes new aquaculture zones to provide for future aquaculture development. Some quarters of the of the aquaculture industry have historically encouraged regional councils to identify new aquaculture zones and it's often promoted as part of a strategic spatial marine planning approach. There was no support for this approach in the feedback on the Draft Regional Plan.

New aquaculture	Re-consenting	Extensions and realignments	Small scale and short term aquaculture	Key policy approach
Same as Option C but with the addition of new aquaculture zones for future development.	Same as Option C			

Option E: Non-restrictive approach

This option involves a non-restrictive approach to managing aquaculture in the region. It's an approach that avid aquaculture supporters might promote. It is also reflects the 'King Salmon' decision by not making re-consenting of marine farms in outstanding natural landscapes a controlled activity. There was no support for this approach in the feedback on the Draft Regional Plan.

New aquaculture	Re-consenting	Extensions and realignments	Small scale and short term aquaculture	Key policy approach
Discretionary	Outstanding areas = restricted-discretionary. Outside outstanding areas = controlled.	Controlled	Restricted-discretionary	• Recognise effects of aquaculture on various coastal uses and values. • Acknowledge existing aquaculture and that it will not always be practical or appropriate to avoid all adverse effects. • Strong recognition of the benefits of aquaculture.

Option F: Very non-restrictive approach

This is the same as Option E but with addition of a controlled activity for new aquaculture in aquaculture development zones. This would be an approach that avid supporters of aquaculture would promote if they supported new aquaculture development zones.

New aquaculture	Re-consenting	Extensions and realignments	Small scale and short term aquaculture	Key policy approach
New aquaculture zones = controlled. Everywhere else = discretionary.	Same as Option E			

Option G: No-new aquaculture

This option involves prohibiting new aquaculture in the region and is summarised in the following table. It is a relatively extreme approach those opposed to aquaculture might promote.

New aquaculture	Re-consenting	Extensions and realignments	Small scale and short term aquaculture	Key policy approach
Prohibited	Discretionary	Non-complying	Prohibited	Discourages new aquaculture

8.6.5 Screening the management options

There are elements of some of the options that are not unviable or consistent with higher level RMA documents.

Identifying new aquaculture zones for future development

It is currently not viable for the council to identify zones for new aquaculture development. There are numerous factors that determine whether a particular location is viable for aquaculture (physically and commercially). The best (and really only) people that can identify the locations for future marine farms are those in the aquaculture industry. However, the aquaculture industry is generally adverse to sharing this information because of commercial sensitivity. Until such time as the industry identifies and shares future sites then the value of the council attempting to identify new development areas is far outweighed by the costs

Consequently this rules out Options D and F.

Prohibiting aquaculture

Option G seeks to prohibit any new aquaculture. This would not give effect to Policy 8 of the New Zealand Coastal Policy Statement, which paraphrased, requires the regional plan to include provision for aquaculture in appropriate places. It would be impossible to argue (under the RMA) that there are no places in Northland's coastal marine area that are appropriate for any type of new aquaculture. This therefore rules out Option G.

King Salmon

Policies 11(a), 13(1)(a) and 15(a) of the New Zealand Coastal Policy Statement 2010 direct that adverse effects on the qualities and characteristics of the prescribed outstanding/significant matters must be avoided. The 'King Salmon' case[29] confirmed that these policies set a bottom line, that is, a regional plan cannot contain provisions that would by default result in such adverse effects occurring (except potentially minor or transitory effects). This means that it is difficult to justify a controlled activity status for aquaculture where it will contravene policies 11(a), 13(1)(a) or 15(a) [30].

While none of the options presented here are in conflict with the King Salmon decision, the issue is highlighted in case anyone proposes a option to make aquaculture a controlled activity in

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8.6.6 High level objectives and measures

Section 32 requires an assessment of "*...the efficiency and effectiveness of the provisions in achieving the objectives...*". Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section 1.6 'Evaluation approach' for more details.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. They also signal a direction for where we want to head, without stating how far we go. Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against.

High level objective	Measure
Maximise the economic and employment benefits of aquaculture.	Three measures are used: 1) Total hectares of hypothetical future space (oysters, mussels, mussel spat and finfish) for which aquaculture resource consent applications are likely to be granted. 2) Hectares of existing aquaculture for which extensions and re-alignments are prohibited, non-complying, discretionary, restricted discretionary and controlled activities. 3) The consent status for small scale and short term aquaculture.
Minimise the adverse effects aquaculture has on significant areas.	Maximum level of adverse effects on significant areas likely to be acceptable for any particular aquaculture proposal: 1 = Significant effects. 2 = Moderate adverse effects. 3 = Minor adverse effects. 4 = No effects.

29 *Environmental Defence Society Incorporated v the New Zealand King Salmon Company Limited. [2014] NZSC 38.*

30 *The RMA doesn't allow aquaculture to be a permitted activity.*

High level objective	Measure
Maximise certainty of new aquaculture not being allowed in significant and outstanding areas.	A mix of consent status and exceptions. 1 = New aquaculture discretionary in outstanding and significant areas 2 = New aquaculture non-complying in outstanding and significant areas 3 = Most new aquaculture prohibited from all outstanding and significant areas - exceptions are small scale/short term aquaculture and minor aquaculture. 4 = Nearly all aquaculture prohibited from all outstanding and significant areas - exceptions are minor aquaculture. 5 = All aquaculture prohibited from all outstanding and significant areas
Recognise the long term investment people made in in the process to develop Plan Change 4.	Degree of change from Plan Change 4: 1 = Major changes (significant change in approach). 2 = Moderate changes (same as 3, but moderate changes to the policies and/or rules). 3 = Minor changes (principles the same but changes made to fit the structure of the new regional plan and some minor changes to the policies and/or rules). 4= No change (word-for-word, the same as Plan Change 4).

Explanation for the high level objectives and measures

Maximise the economic and employment benefits of aquaculture

This high level objective has been included for obvious reasons and is a requirement of Section 32 s32(2)(a), which requires an assessment of the impacts on economic growth and employment opportunities. For aquaculture, the extent of the economic and employment benefits is influenced by four key factors:

- Opportunities for new aquaculture space;
- Flexibility to amend existing space (re-alignment and extensions);
- Opportunities to test new technologies, methods and species; and
- Certainty of re-consenting.

Measures have been developed for each of these factors.

Opportunities for new aquaculture space

Obviously we cannot predict with certainty where demand for new aquaculture may be. It would be false to say that that aquaculture could go anywhere. There is a range of constraints independent of the regional plan (physical, commercial and regulatory) that means that aquaculture cannot be sited anywhere. There have been several previous attempts to identify the potential for aquaculture development. We have used this previous work to come up with a suite of future potential sites. We can use these sites to judge the impact each option would have on the potential to develop these sites.

Location	Area and type
Te Puna Inlet, Bay of Islands	25ha (oysters)
Hokianga Harbour	50ha (oysters)
Whāngāpē Harbour	20ha (oysters)
Herekino Harbour	20ha (oysters)
Mid-Hokianga Harbour	20ha (finfish)
Henry Island (Whangaruru Harbour entrance)	10ha (finfish)
Te Ngaire	40ha (finfish)
Flat Island (between Cavalli and Stephenson's islands)	70ha (mussels)
Bream Bay	200ha (mussels)
Whangamumu Pt – Home Pt	350ha (mussels)
Takou Bay	300ha (mussels)
Rangihoua Bay (Bay of Islands)	35ha (mussels)
Tauroa Pt (Ahipara)	100ha (mussel spat)

These sites were derived from the following previous work on identifying future potential aquaculture development sites in Northland:

- Enveco, 2010. *The Northland Regional Economic Impacts of Aquaculture.*
- Ministry for the Environment, April 2009. *Draft Northland AMA Project Plan.*
- The work the Northland Regional Council carried out to identify 18 potential sites, which we had planned to advance as new aquaculture zones (Aquaculture Management Areas – AMAs). For more information see 14.2 'Appendix 2 - History of Plan Change 4 (Aquaculture) to the Regional Coastal Plan'.
- Maori aquaculture settlement areas. *Gazette notices No. F621, F611, F617 and F616, Notice Declaring an Aquaculture Settlement Are for the Purposes of the Maori Commercial Aquaculture Claims Settlement Act 2004.*

The total hectares by aquaculture type are:

- Oyster = 265ha
- Mussels = 990ha
- Mussel spat = 100ha
- Finfish = 150ha

Oysters, mussels, mussel spat and finfish are the species that have traditionally been identified as having the greatest potential for new development in the region. There are other types of aquaculture that may have potential in the region (for example, Geoduck), however, we are not aware of any published information about the commercial potential for these species in Northland. Irrespective, the general range of environments and main aquaculture growing systems are represented in the table above.

Any potential sites within the following mapped areas have been excluded:

- Significant ecological areas.
- Areas of outstanding natural character.
- Outstanding natural features.

This is because we assume that new aquaculture (on the scale of the type described in the table) is very unlikely to be appropriate, as it would have adverse effects on the values of these areas and therefore contravene New Zealand Coastal Policy Statement 2010 policies 11(a), 13(1)(a) and 15(a).

The only mapped areas where there were some potential aquaculture sites were the Significant Ecological Areas. The excluded sites were:

Location	Area and type
Kaipara Harbour (Northland region)	100ha (oysters)
North Parengrenga Harbour	50ha (oysters)
Kaipara Harbour (Northland region)	80ha (finfish)
Motukahakaha Bay	35ha (mussels)

Arguably, given the scale of the Significant Ecological Areas, aquaculture may be plausible (i.e. able to avoid adverse effects on the significant ecological values) in these areas. However, for the purposes of this evaluation, the decision was made not to include them. Regardless, whether these areas are included or not is unlikely to affect the relative differences between the management options.

The measure is determined by the activity status for aquaculture. If an application for a potential site is controlled then we can assume that resource consent would be granted for all the area. However, for a discretionary activity, there is no guarantee that resource consent would be granted. It is the same situation for non-complying activities, except there is the added hurdle of the RMA Section 104D test. Resource consent can only be granted for a non-complying activity if the adverse effects will be minor or the activity is not contrary to objectives an policies in the plan.

On this basis, we have used multipliers to account for the likelihood of resource consent being granted based on the activity status:

- Controlled activity = 1
- Discretionary activity = 0.5
- Non-complying activity= 0.25.

The multipliers for discretionary and non-complying activities have no basis other than to recognise that consent is not always granted and that it is generally more difficult to get resource consent for a non-complying activity compared to a discretionary activity.

The following is an example of how it works for a hypothetical option. For option X, 300ha of the future potential sites is not within areas prohibited for aquaculture. The 300ha is made up of:

- 120ha in areas where new aquaculture is a controlled activity;
- 80ha in areas where new aquaculture is a discretionary activity; and
- 100ha in areas where new aquaculture is a non-complying activity.

Total area of potential sites (not within prohibited areas)	Controlled	Discretionary	Non-complying	Total area after accounting for activity status multiplier
300ha	120ha x 1 = 120ha	80ha x 0.5 = 40ha	100ha x 0.25 = 25ha	165ha

After accounting for the activity status, the actual area of potential sites is calculated to be 165ha.

We thought about adding more detail to the multiplier by trying to account for the tenor of the policies. So for example, if the policies strongly promote aquaculture then the multiplier would be higher if these policies were absent. However, we decided that this would make it too complicated (it is complicated enough as it is) and unlikely provide any more help to decide between the options.

Flexibility to amend existing space (re-alignment and extensions)

The aquaculture industry believe that moderate growth in oyster and mussel production, like what was anticipated in the The Tai Tokarau Northland Regional Growth Study, can be achieved by providing for small extensions to existing farms which use existing infrastructure efficiently and sustainably [31].

Re-alignment and extensions are the main means of optimising existing space. The measure we have used assesses the hectares of existing aquaculture for which re-alignments and extensions are either a prohibited, non-complying, discretionary, restricted discretionary or controlled activity. The assumption is the more restrictive the consent status, the greater the constraint on re-alignment and extensions.

According to council records (as at February 2017), there is about 850 hectares of approved marine farming space in Northland. About 600 hectares of the 850 approved hectares is within proposed prohibited areas (as per Options A and B).

Opportunities to test new technologies, methods and species

We don't know where the future demand to test new technologies, methods and species will be.

The aquaculture industry calls this type of aquaculture "experimental aquaculture". In this report we term it "small-scale and short term aquaculture". The measure we have used looks at the consent status of small-scale and and short term aquaculture (prohibited, non-complying, discretionary, restricted discretionary or controlled activity). The assumption is the more restrictive the consent status, the greater the constraint on small-scale and and short term aquaculture .

Minimise adverse effects on significant areas

Aquaculture can affect a range of uses and values of the coastal marine area. Rather than considering impacts on uses and values generally, we have limited it to the significant areas ("Significant areas" are described in 8.6.4 'Management options') [32]. These are the uses and values where there is the greatest risk of conflict with aquaculture.

The measure for this objective is the level of adverse effects on significant areas that are likely to be acceptable from any particular aquaculture proposal. In other words, for any resource consent application received by the regional council what is the maximum level of adverse effects on the significant areas likely to be acceptable under each management option for a typical commercial-scale aquaculture proposal. This will be contingent on the rule activity status, the strength of the policy on minimising effects on important area, and a judgement of how resource consents would be processed.

Maximise certainty of new aquaculture not being allowed in significant and outstanding areas

31 *Aquaculture NZ feedback on the Draft Regional Plan, 23 September 2016*

32 *See "High level objectives not included" section below for why outstanding areas haven't been included*

There is a sector of the community who are very concerned about the potential of new aquaculture of being able to apply for resource consent in significant and outstanding areas (the areas of highest value to the community), and even worse resource consent being granted.

If there is an ability to apply for resource consent in significant and outstanding areas, then for those for which it is a concern, there is a cost to keeping abreast of possible resource consent applications and then the cost of making submissions etc if an application is made. This was identified by appeal parties to Plan Change 4 (Aquaculture) to the Regional Coastal Plan as a key reason for participating in that process and the driver for their seeking prohibited activity status for their particular areas of interest.

The measure used is the consent status for new aquaculture in significant and outstanding areas and the extent of exceptions. The exceptions referred to in the measure are short term and small scale aquaculture, and minor aquaculture (marae-based aquaculture (small-scale and for customary purposes), aquaculture in Māori oyster reserves (designated areas under fisheries legislation) and relocation of some farms in Pārengarenga Harbour).

At one end of the spectrum, if aquaculture is prohibited in significant and outstanding areas, then there is a high level of certainty. At the other end of the spectrum, if resource consent for new aquaculture can be applied for in significant and outstanding areas, then there is a low level of certainty.

Recognise the long-term investment people made in the process to develop Plan Change 4

Most appellants on Plan Change 4 (Aquaculture) are likely to be concerned that the proposed regional plan may depart from the final outcome of Plan Change 4, which was only very recently made operative[33]. Appellants and the regional council invested a lot of time and effort in the process. The level of concern from participants is likely (and is assumed) to be proportionate to the extent the proposed management option differs from Plan Change 4 – hence the scale. The most significant aspect of Plan Change 4 is the extensive areas (the significant and outstanding areas) where new aquaculture is prohibited. Most of the judgement, about the extent the proposed management option differs from Plan Change 4, is based on the extent to which the prohibited areas are maintained.

High level objectives and measures not included

Minimise likelihood of aquaculture having adverse effects on outstanding areas.

In the draft version of this Section 32 report we included a high level objective focusing on the adverse effects on the 'outstanding' areas described in policies 11(a), 13(1)(a), 15(a) and 16(b) of the New Zealand Coastal Policy Statement 2010 (NZCPS). However we have now excluded it because a recent High Court case has confirmed that avoiding adverse effects on outstanding areas is an obligation for the development of the regional plan *and* when processing resource consents.

The relevant NZCPS policies state that adverse effects on the prescribed outstanding matters must be avoided. At the time of the draft Section 32 (mid 2016) the understanding was that resource consent *could* be granted for aquaculture that results in adverse effects on the prescribed outstanding matters. This understanding was on the basis that a decision maker on a resource consent application only has to 'have regard' to policy. It meant that there was the potential for adverse effects on the outstanding matters could occur and therefore there could be differences between the management options (e.g. a prohibited rule would mean no chance of adverse effects but a discretionary rule could result in resource consent being granted to aquaculture that has adverse effects on outstanding matters). However this has changed with the recent Davidson case [34] which, put simply, held that the *King Salmon* approach should apply when applying for a resource consent.

Given that the 'avoid adverse effects' requirement applies to resource consents and to the regional plan, then there is no need to include this high level objective as the 'score' for each option would be the same (and therefore not helpful in deciding between the options).

Certainty of re-consenting

33 *For example, this concern was expressed to council in a letter dated 11 July 2017 from a lawyer who represented a number of parties through the appeals process*

34 *R J Davidson Family Trust v Marlborough District Council [2017] NZHC 52*

In the draft Section 32 there was an additional measure for the "Maximise the economic and employment benefits of aquaculture" high level objective. It's no longer included because the 'score' for each option was the same. This reflected that the rules for reconsenting for each option was the same - generally controlled outside outstanding areas and restricted-discretionary or discretionary within outstanding areas.

It was originally included because security of investment to the existing industry is a key concern of the aquaculture industry - see, for example, *The New Zealand Aquaculture Strategy 2006,* Aquaculture NZ's submission on the proposed Auckland Unitary Plan, and Aquaculture NZ's feedback on the Draft Regional Plan.

The scale used was judgement of the level of certainty, and picked up variations between outstanding areas (the areas described in policies 11(a), 13(1)(a) and 15(a) of the New Zealand Coastal Policy Statement 2010) and other areas. Level of certainty is primarily a function of the rule status and applicable policies. The measure was:

> *Level of certainty resource consent for existing aquaculture will be granted:*
>
> *1 = Re-consenting prohibited everywhere.*
>
> *2 = Re-consenting prohibited in high value (outstanding and significant) areas and no certainty for areas outside high value areas.*
>
> *3 = No certainty in or outside high value areas*
>
> *4 = High certainty outside high value areas, but no certainty inside high value area.*
>
> *5 = High certainty everywhere.*

8.6.7 Evaluating the management options

High level objective and measure		Option A: Plan Change 4	Option B: Extensive prohibited areas but with some exceptions	Option C: No prohibited areas (non-complying)	Option E: Non-restrictive approach
Maximise the economic and employment benefits from aquaculture.	*Measure 1:* Total hectares of hypothetical future space (oysters, mussels, mussel spat and finfish) for which aquaculture resource consent applications are likely to be granted. Refer 14.3 'Appendix 3 - Calculations of impact of management options on hypothetical aquaculture development' for the calculations of the areas.	Oyster: 57.5 ha Mussel: 235 ha Fin fish: 30 ha	Oyster: 57.5 ha Mussel: 235 ha Fin fish: 30 ha	Oyster: 57.5 ha Mussel: 440 ha Fin fish: 32.5 ha	Oyster: 57.5 ha Mussel: 527.5 ha Fin fish: 35 ha
	Measure 2: Hectares of existing aquaculture for which extensions and	Prohibited: 600 ha Discretionary: 250 ha	Discretionary or restricted discretionary = 850 ha	Discretionary or restricted discretionary = 850 ha	Discretionary = 600 ha Controlled = 250 ha

High level objective and measure		Option A: Plan Change 4	Option B: Extensive prohibited areas but with some exceptions	Option C: No prohibited areas (non-complying)	Option E: Non-restrictive approach
	re-alignments are prohibited, non-complying, discretionary, restricted discretionary and controlled activities.				
	Measure 3: The consent status for small scale and short term aquaculture. 1 = Prohibited 2 = Non-complying 3 = Discretionary 4 = Restricted-discretionary	Outstanding and significant areas = 1 Everywhere else= 3	Outstanding and significant areas = 2 Everywhere else= 3	Outstanding and significant areas = 3 Everywhere else= 3	Outstanding and significant areas = 4 Everywhere else= 4
Minimise the adverse effects aquaculture has on significant areas. *Measure:* Maximum level of adverse effects on significant areas likely to be acceptable for any particular aquaculture proposal. 1 = More than significant effects. 2 = Significant effects. 3 = Moderate adverse effects. 4 = Minor adverse effects. 5 = No effects.		New = 5 Extensions and realignments = 5 Re-consenting = 2	New = 5 Extensions and realignments = 2 Re-consenting = 2	New = 3 Extensions and realignments = 2 (significant) Re-consenting = 2 (significant)	New = 2 Extensions and realignments = 2 Re-consenting = 2
Maximise certainty of new aquaculture not being allowed in significant and outstanding areas. *Measure:* A mix of consent status and exceptions. 1 = New aquaculture discretionary in outstanding and significant areas		4	3	2	1

High level objective and measure	Option A: Plan Change 4	Option B: Extensive prohibited areas but with some exceptions	Option C: No prohibited areas (non-complying)	Option E: Non-restrictive approach
2 = New aquaculture non-complying in outstanding and significant areas 3 = Most new aquaculture prohibited from all outstanding and significant areas - exceptions are small scale/short term aquaculture and minor aquaculture. 4 = Nearly all aquaculture prohibited from all outstanding and significant areas - exceptions are minor aquaculture. 5 = All aquaculture prohibited from all outstanding and significant areas				
Recognise the long-term investment people made in in the process to develop Plan Change 4. *Measure:* Degree of change from Plan Change 4. 1 = Major changes (significant change in approach). 2 = Moderate changes (same as 3, but moderate changes to the policies and/or rules). 3 = Minor changes (principles the same but changes made to fit the structure of the new regional plan and some minor changes to the policies and/or rules). 4= No change (word-for-word, the same as Plan Change 4).	3	2	1	1

Certainty about the evaluation

Overall we are confident about the accuracy of the evaluation for all options. We do not think it would be viable and/or worthwhile to get more information to increase the accuracy of our evaluation as it is very unlikely to change the relative differences between the options.

The evaluation for the first measure of the first high level objective is based on a forecasting of potential future development. Forecasting future development is inherently fraught with assumptions. We believe it is probably as good an estimate as any as it is based on the best information available. The accuracy of the evaluations of the second and third measure are inherently high as they relate directly to consent status (they are a matter of fact not judgment).

The evaluation of the measure for the second objective (minimise effects on significant areas) has uncertainty because it is a judgement of how a particular aquaculture proposal would be considered in respect to its adverse effects. The judgement is based on case law and local experiences of processing resource consents for aquaculture.

The evaluation of the measure for the third high level objective is high because (again) it's based on the consent status.

There is some uncertainty about the evaluation of the measure for the last high level objective. Whether something is e.g. a moderate or a minor change is a judgement. Some people may not agree with how each option has been judged. What the the evaluation is for any particular option is not too important - the most important thing is the relative differences between the options i.e. whether an option is more or less so than other options. We're confident that the relative differences are accurate.

Time-frame of the evaluation

The evaluation is for the life-time of the plan (10-15 years).

The preferred management option

The preferred management option for the Plan is Option B: Extensive prohibited areas and permissive for existing aquaculture. It strikes the best balance of:

- recognising the investment the regional council and appellants have put into Plan Change 4 ,
- providing opportunities for the aquaculture industry to optimise their current space and infrastructure,
- providing opportunities to test new technologies, methods and species,
- limiting the potential for environmental impacts on the values of significant areas, and
- providing certainty to the community that commercial scale aquaculture is not allowable in significant and outstanding areas.

Option's C and E are a major shift from Plan Change 4. However if maintaining the integrity of Plan Change 4 was not considered important, and more weight were to be given to providing opportunities for new aquaculture development, then Option C would be the preferred option.

Option A (obviously) maintains Plan Change 4 almost in it's entirety, but is at the expense of providing opportunities for the existing industry to optimise existing farms and providing opportunities to test new technologies, methods and species . Under Option A approximately 70% (600ha) of existing farms could not extend or be re-aligned.

8.7 Reclamations

8.7.1 Executive summary

Reclamation of the foreshore and/or seabed is a largely irreversible activity that can have significant adverse effects on coastal habitats and ecosystems. They result in the physical burial of the seabed or foreshore, and all habitat and aquatic life associated with it.

In Northland, reclamation of the foreshore and seabed has historically been used as a means of creating additional areas of dry land for a variety of purposes, including port development, farming, water dependent activities (for example, marinas, wharves), shore front development for industrial and residential purposes, road and rail route alignments, and to dispose of dredging spoil and surplus fill.

Benefits that may result from reclamations include improvements in public access to the coastal marine area (for example, with wharves and marinas) and benefits to the economic well-being of people and communities (such as through port developments).

There are many unauthorised reclamations around Northland's coast – most tend to be associated with roads and other infrastructure. By all accounts, the majority are not causing adverse environmental effects because the reclamation occurred many years ago. From an administration perspective, these can cause problems in that they are generally not surveyed and therefore, while they form dry land, they are still legally within the coastal marine area.

National guidance (through the New Zealand Coastal Policy Statement 2010) seeks to avoid reclamation of land in the coastal marine area unless specified criteria relating to need and significant benefit are met, including the extent to which it would allow infrastructure to operate efficiently.

Four different 'management' options for reclamations are evaluated: rolling over the status quo and comparatively heavy, medium and lighter regulatory approaches.

Option C (medium regulatory approach) came out as the preferred management option because it best strikes a balance (relative to the other options) between enabling economic and social well-being of communities to be enhanced (through reclamations assisting appropriate coastal development to proceed) and protecting environmental bottom lines – in this instance deemed to be 'significant' marine areas. The rules are outlined below.

Reclamations within significant marine areas	Reclamations outside of significant marine areas	Unlawful reclamations – s355A
Non-complying, except reclamations associated with regionally significant infrastructure which are discretionary.	Discretionary.	Controlled for pre-2004 reclamations associated with public roads, otherwise discretionary.

8.7.2 Relevant provisions

This evaluation supports the following Regional Plan provisions for reclamations:

- Rules - C.1.6 Reclamations (entire section)
- Rule - C.1.8 Coastal Works General Conditions

8.7.3 The problem, opportunity and/or requirement

Reclamation of the foreshore and/or seabed is a largely irreversible activity that can have significant adverse effects on coastal habitats and ecosystems.

In Northland, reclamation of the foreshore and seabed has historically been used as a means of creating additional areas of dry land for a variety of purposes, including port development, farming, water dependent activities (for example, marinas, wharves), shore front development for industrial and residential purposes, road and rail route alignments, and to dispose of dredging spoil and surplus fill.

Reclamations result in the physical burial of the seabed or foreshore, and all habitat and aquatic life associated with it. Reclamations can have adverse effects on indigenous biodiversity and ecosystems, natural character, amenity values, and sites of significance to Māori. Other adverse environmental effects on the coast include:

- The total and largely irreversible exclusion of water-based uses from the reclaimed area;
- Reduced tidal flushing, particularly in estuarine and inner harbour areas, through reduction of the volume of water flowing into and out of the area with changes to natural water movement patterns; and
- Reductions in water quality in areas of reduced water movement.

Benefits that may result from reclamations include improvements in public access to the coastal marine area (for example, with wharves and marinas) and benefits to the economic well-being of people and communities (such as through port developments), or by increasing the amount of land suitable for activities that need to be located on the coast or in that particular area.

Existing policies in the Regional Coastal Plan seek to restrict new reclamations by ensuring that they only proceed if they are associated with activities that have an operational need to be in the coastal marine area, are of the minimum size proposed and have no practical land-based alternative.

Applications for reclamations are quite infrequent (the council has only granted resource consent for about 20 since 2004), illustrating that they tend to be associated with significant works.

There are many unauthorised reclamations around Northland's coast – most tend to be associated with roads and other infrastructure. By all accounts, the majority are not causing adverse environmental effects because the reclamation occurred many years ago. From an administration perspective, these can cause problems in that they are generally not surveyed and therefore, while they form dry land, they are still legally within the coastal marine area. The existing coastal plan looks to encourage the authorisation of existing unauthorised reclamations by treating them as 'discretionary' activities and acknowledging that it's generally impractical to remove these reclamations.

National guidance (through the New Zealand Coastal Policy Statement 2010) seeks to avoid reclamation of land in the coastal marine area unless specified criteria relating to need and significant benefit are met, including the extent to which it would allow infrastructure to operate efficiently. Where a reclamation is considered to be a suitable use of the coastal marine area, decision-makers must have particular regard to a range of potential effects that may arise from the proposed reclamation's form and design.

8.7.4 Management options

This section summarises the suite of management options for reclamations. The intention is not to identify every different combination of approach as there would be many, but to represent the range of options and highlight key differences in approaches.

The options focus on the activity status for new reclamations within significant marine areas, outside significant marine areas and legalising unauthorised reclamations. Four options are presented; rolling over the status quo provisions in existing regional plans and then a comparatively 'heavy', 'medium' and 'light' regulatory approach.

There are some provisions in the current regional plans that we don't think need changing and are unlikely to be contentious. Also there are some new provisions we think are obvious for the new Regional Plan. The following is a list of these uncontentious and obvious provisions that will be implemented regardless of the option selected:

- The existing Marine 1 Management Area (known as MM1 in the coastal plan but marine management 1 in the new Regional Plan) in the Regional Coastal Plan will cease to exist in the new plan. We are instead moving to more site-specific overlays (such as significant marine biodiversity), where the key values and characteristics of the specific location can be captured and managed accordingly. Any land that is currently zoned marine management 1 and not subject to site-specific overlays in the new plan will default to being part of the General Coastal Zone, currently known as the Marine 2 Management Area – for more information see the section 9 'Significant natural and historic heritage'.
- The new regional plan will not contain policy guidance on determining when reclamations are appropriate because this guidance is clearly set out in the New Zealand Coastal Policy Statement. This requires that reclamations are to be avoided unless all of the following clauses can be met:
  - Land outside the coastal marine area is not available for the proposed activity;
  - The activity which requires reclamation can only occur in or adjacent to the coastal marine area;
  - There are no practical alternative methods of providing the activity; and
  - The reclamation will provide significant regional or national benefits.

Key terms

An explanation of the key terms used in describing the options:

Significant marine areas

These are the outstanding/nationally significant areas described in policies 11(a) (biodiversity), 13(1) (natural character), 15(a) (natural features and landscapes) and 16(b) (surf breaks) of the New Zealand Coastal Policy Statement 2010. These policies direct that adverse effects on the prescribed matters must be avoided. For the purposes of this section, these are known as: Significant Ecological Areas, Areas of Outstanding Natural Character, Outstanding Natural Landscapes and Features, and Nationally Significant Surf breaks.

Option A: rolling over the current approach in the Regional Coastal Plan

Overview: this option makes an assumption that the existing Marine 1 Management Area is essentially replaced with site specific overlays – known as 'significant marine areas'. Reclamations within these areas would generally be a prohibited activity and other reclamations a discretionary activity.

Background:this option is essentially based on rolling over the current rules and policies in the operative Regional Coastal Plan.

Reclamations within significant marine areas	Reclamations outside of significant marine areas	Authorising unlawful reclamations – s355A	Key policy approach
Prohibited within 'significant' marine areas except for road realignment (then non-complying or discretionary).	Discretionary.	Discretionary.	New reclamations – discourage unless associated with a use or development that need to be located in the coastal marine area (for example, a port). Unauthorised reclamations – recognise that generally it's impractical to remove a reclamation and therefore authorising them is the only practical alternative.

Option B: 'heavy regulatory' approach

Overview: the most stringent of the options tested – reclamations within significant marine areas would be prohibited and they would be non-complying outside. Authorising unlawful reclamations would also be a non-complying activity.

Background: this option would see a very strict interpretation of Policy 10 of the New Zealand Coastal Policy Statement for reclamations in Northland.

Reclamations within significant marine areas	Reclamations outside of significant marine areas	Authorising unlawful reclamations – s355A	Key policy approach
Prohibited.	Non-complying.	Non-complying.	Strong guidance to avoid any reclamations unless all four limbs of coastal policy statement, Policy 10(1) can be demonstrated to be met.

Option C: 'medium regulatory' approach

Overview: can be viewed as a middle ground approach – reclamations outside significant marine areas are discretionary activities, reclamations within significant areas are 'non-complying' activities (except for those associated with regionally significant infrastructure, which are discretionary). Regionally significant infrastructure is given a 'leg up' because of the potential to provide significant economic and social benefit to local communities as well as the wider region (such as through the creation of new roads or port facilities). Authorising unlawful reclamations would be 'discretionary', which recognises that the unlawful reclamation may in fact have been in existence for many years, potential adverse effects will generally be no more than minor, and generally it's impractical to remove a reclamation.

Background: this option includes a controlled activity status for unauthorised public road reclamations. This came after suggestions from regional Councillors that a permitted activity for these types of reclamations could be useful. Investigations determined that it was not possible to have a permitted activity for reclamations so a controlled activity is the next best thing.

A number of submitters on the draft Regional Plan supported this suite of provisions. There were also requests by submitters to either relax or tighten up individual rules. For example, Royal Forest and Bird suggest that any new reclamations should be a non-complying activity.

Reclamations within significant marine areas	Reclamations outside of significant marine areas	Authorising unlawful Reclamations – s355A	Key policy approach
'Non-complying', except reclamations associated with regionally significant infrastructure are 'discretionary'.	Discretionary.	Controlled for reclamations associated with public roads, otherwise discretionary.	As Option B above but recognise the potential benefits associated with regionally significant infrastructure.

Option D: 'lighter regulatory' approach

Overview: this is the most permissive of the options assessed. There are no prohibited or non-complying activities. Authorising unlawful reclamations would be a controlled activity, meaning that council would have to grant resource consent to the application.

Background: the lightest option assessed.

Reclamations within significant marine areas	Reclamations outside significant marine areas	Authorising unlawful reclamations – s355A	Key policy approach
Discretionary.	Restricted discretionary (non-notified).	Controlled.	Similar to Option C above.

8.7.5 High level objectives and measures

Section 32 requires an assessment of "*...the efficiency and effectiveness of the provisions in achieving the objectives...*". Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section 1.6 'Evaluation approach' for more details.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. They also signal a direction for where we want to head, without stating how far we go – that comes later (they are the beginnings of objectives).

Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against.

High level objective	Measure
Minimise likelihood of adverse effects impacting the values/characteristics of 'significant marine areas'.	Likelihood of adverse effects on significant marine areas occurring from any particular reclamation proposal: 1 = high. 2 = moderate. 3 = low. 4 = very low. 5 = none.
Minimise likelihood of adverse environmental effects from reclamations outside significant areas.	Ability to practicably control (avoid or mitigate) adverse effects: 1 = minor control (likely that adverse effects could occur). 2 = moderate control (medium likelihood that adverse effects could occur). 3 = significant control (unlikely that adverse effects could occur). 4 = full control (impossible that adverse effects could occur).

High level objective	Measure
Maximise opportunities for economic and social benefits for the region from reclamations.	Extent rules enable or restrict reclamations: 1 = prohibited. 2 = very restrictive. 3 = slightly restrictive. 4 = slightly enabling. 5 = very enabling.

Explanation for the high level objectives and measures

Minimise likelihood of adverse effects impacting the values and characteristics of 'significant marine areas'.

This objective focusses on potential adverse effects on the areas described in policies 11(a), 13(1)(a), 15(a) and 16(b) of the New Zealand Coastal Policy Statement 2010. These policies direct that adverse effects on the prescribed outstanding matters must be avoided. King Salmon has determined that there is little flexibility, that is, it is a bottom line. This contrasts to effects on other uses and values where there is more scope for trading-off.

The scale is the likelihood of any particular reclamation causing adverse effects on significant marine areas. It is a judgment call that will generally be based on the strength of the policy and the extent it will be given effect. The key 'test' for significant areas is whether adverse effects will occur – as that's the bar set by the New Zealand Coastal Policy Statement 2010. Also, the reality is that if adverse effects are allowed, they would unlikely be more than minor. In other words, given the New Zealand Coastal Policy Statement 2010, it is very unlikely that resource consent would be granted allowing more than minor adverse effects on significant marine areas.

Minimise likelihood of adverse environmental effects from reclamations outside significant areas.

This objective has been chosen to ensure there is one covering the environmental effects of reclamations outside significant marine areas. Depending on factors such as location and size, reclamations have the potential to cause significant and irreversible adverse effects. The degree to which adverse effects can practicably be minimised is directly related to the level of control in the rules.

We have used a constructed measure to assess whether the management options are likely to practicably control (avoid or mitigate) adverse effects on the environment. The measure ranges from minor control (1), which can be viewed as a permitted or controlled activity, to full control (4), which equates to a prohibited activity. A constructed measure has been used because it is very difficult to quantify the actual and potential adverse effects of any particular management option.

Maximise economic and social benefits to the region associated with reclamations.

This objective has been chosen because reclamations (in appropriate circumstances and locations) have the potential to provide significant benefits (primarily economic and social) to the region. Examples include when they are associated with port activities, marinas or associated with roads and other public utility purposes. This objective also applies to how easy or hard it will be for owners of unauthorised reclamations to get reclamations authorised.

The measure therefore seeks to determine the extent that rules enable or restrict reclamations. A score of 1 essentially equals a 'prohibited' activity, whereas a score of 5 essentially equates to a 'permitted' activity – being the most permissive and enabling option.

Objectives not included

Section 32 requires an assessment of the impacts on economic growth and employment opportunities (s32(2)(a)). However, the impact of the options on these is imperceivable and/or can't be determined with any confidence. Therefore, economic growth and employment opportunities have not been included as high level objectives. For more information go to the section 1.7 'Assessing impacts on economic growth and employment opportunities' (which is in the Section 32 Introduction section).

An objective specifically associated with minimising adverse effects on 'other uses and values' of the coastal marine area (areas not identified as being significant marine areas) was considered but disregarded because all reclamations will require a resource consent, meaning that consent officers should consider all potential adverse effects at the application stage.

8.7.6 Evaluating the management options

High level objective	Option A	Option B	Option C	Option D
	Evaluation	Evaluation	Evaluation	Evaluation
Minimise likelihood of adverse effects impacting the values/characteristics of 'significant marine areas'. *Measure:* Likelihood of adverse effects on significant marine areas occurring from any particular reclamation proposal 1 = high. 2 = moderate. 3 = low. 4 = very low. 5 = none.	4	5	3	3
Minimise likelihood of adverse environmental effects from reclamations outside significant areas. *Measure:* Ability to practicably control (avoid or mitigate) adverse effects 1 = minor control (likely that adverse effects could occur). 2 = moderate control (medium likelihood that adverse effects could occur). 3 = significant control (unlikely that adverse effects could occur). 4 = full control (impossible that adverse effects could occur).	2.5	3	2.5	2
Maximise opportunities for economic and social benefits for the region from reclamations.	3	2	4	4

High level objective	Option A	Option B	Option C	Option D
	Evaluation	Evaluation	Evaluation	Evaluation
Measure: Extent rules enable or restrict reclamations 1 = prohibited. 2 = very restrictive. 3 = slightly restrictive. 4 = slightly enabling. 5 = very enabling.				

Certainty about the evaluation

There is always uncertainty about the potential impacts of management options. We're moderately to highly confident about the accuracy of the evaluation for all the options – it is our 'best guess', taking into account the fact that we don't know where future coastal development (specifically reclamations) is likely to occur. We don't think it would be viable and/or worthwhile to get more information to increase the accuracy of our evaluation. The main reason being that it is very unlikely to change the relative differences between the options and all applications for reclamations will require resource consent approval as well.

Time-frame

The evaluation is made over the life-time of the plan (10-15 years).

The preferred management option

The preferred management option is Option C: medium regulatory approach.

Option C is the preferred management option because it best strikes a balance (relative to the other options) between enabling economic and social well-being of communities to be enhanced (through reclamations assisting appropriate coastal development to proceed) and protecting environmental bottom lines – in this instance deemed to be 'significant' marine areas. It is highly likely that the policy direction of avoiding adverse effects of activities on the values and characteristics of significant marine areas would mean that applications for reclamations in 'significant' areas may well be declined – even if they are associated with regionally significant infrastructure. Although reclamations within these areas are non-complying (or discretionary for those associated with regionally significant infrastructure), it is considered there is not much difference in the ability to achieve the first high level objective between options C and B, even though Option B would prohibit reclamations within significant marine areas.

Option C scored slightly higher than Option D against the second objective and this is what separated these two management options.

This option ranked best equal with Option D against achieving the third objective. This is largely because reclamations within significant marine areas associated with regionally significant infrastructure would be a discretionary activity under this option.

When weighted against the other options, Option B (heavy regulatory approach) has not ranked as the preferred option. It naturally scored best against the first objective, as reclamations within significant marine areas would be prohibited. However, it ranked the lowest against the third objective. Greater weight has been assigned to this objective than the other ones because of clear guidance in the New Zealand Coastal Policy Statement about appropriateness of reclamations and

the requirement to avoid adverse effects on the values and characteristics of significant marine areas. General reclamations would be a 'non-complying' activity under this option, which is considered very restrictive and would not assist with achieving this objective.

Rolling over the 'status quo' (Option A) is not recommended as the preferred approach but it should be noted that Option C (the preferred approach) would not be a significant departure from the current rules. The key difference is that Option C is slightly more enabling than the existing rules.

The 'softer regulatory' approach (Option D) almost scored identical to the preferred option with regards to achieving the high level objectives (it scored the same with regards to achieving the first and third objectives). It scored slightly less than Option C with regards to the second objective, primarily because it would be a guaranteed non-notified process. It is considered that there is less ability to practically control adverse effects and this option might enable reclamations to occur in inappropriate locations.

8.8 Surf breaks

8.8.1 Executive summary

This section evaluates the options for managing regionally significant surf breaks and other mapped surf breaks in the new Regional Plan. The relevant Regional Plan provision is:

- Policy D.5.26- 27 - Regionally Significant Surf Breaks

Surf breaks are a finite natural resource and the source of recreation for a diverse and increasingly large range of participants. It is estimated that approximately 7% (310,000) of New Zealanders "surf" on a regular basis[35].

In Northland, surf breaks are an important resource contributing to tourism, economic development and amenity values as well as being recreational assets. The Wavetrack New Zealand Surf Guide identifies 78 surf breaks in Northland.

The value of surfing and surf breaks to New Zealand is recognised by the New Zealand Coastal Policy Statement 2010 (NZCPS). Policy 16 of the NZCPS requires the protection of surf breaks of National Significance (Schedule 1 – includes several breaks at Ahipara on Northland's west coast).

There is mounting evidence from New Zealand and internationally that suggests inappropriate development can adversely affect or, in severe cases, destroy surf breaks. The main coastal activities and engineering structures that can alter wave quality and surf breaks are:

1) Seawalls;
2) Dredging;
3) Dumping of dredge spoil;
4) Groynes;
5) Artificial nourishment;
6) Jetty construction or extensions;
7) Breakwaters;
8) Boat ramps;
9) Port or marina development;
10)Outfall pipelines; and
11) Piers.[36]

This report sets out the options for identifying and managing Regionally Significant Surf Breaks and other mapped surf breaks. The activities that present the most risk to surf breaks are all consentable activities. For that reason the 3 options evaluated in this report focus on policies intended to guide the resource consent decisions;

- Option A – policy requiring activities to avoid significant adverse effects on Regionally Significant Surf Breaks and have regard to the effects of activities on all identified surf breaks;
- Option B – policy requiring activities to minimise adverse effects on Regionally Significant Surf Breaks; and
- Option C – policy requiring the values of Regionally Significant Surf Breaks and other identified surf breaks to be considered in decision-making.

Option B requires adverse effects to be minimised, which is essentially the same direction given in the Act. This option was discounted through the screening process because it provides little to no additional benefit to applicants or decision-makers.

Options A and C take different approaches; Option A sets a threshold for adverse effects, which determines a point at which adverse effects are unacceptable. Whereas, Option C requires the values of Regionally Significant Surf Breaks to be considered in resource consent decision-making.

35 *B. Perryman for Bay of Plenty Regional Council, Bay of Plenty Surf Break Study, April 2011.*

36 *Scarfe B. E., Healy T. R., Rennie H. G., and Mead S. T., Sustainable Management of Surfing Breaks - An Overview, An Overview, Reef Journal, 2009.*

The preferred management option is Option A. This option provides for the consideration of effects on surf breaks and provides some protection (development must avoid significant adverse effects) to Regionally Significant Surf Breaks in recognition of the recreational, social and economic benefits they provide for the region.

This option does not provide absolute protection to the breaks scheduled in the new Regional Plan but it does provide for their consideration in Resource Management decisions. While the balance of this policy is tipped towards the 'protection' of Regionally Significant Surf Breaks, it also provides for development where effects can be managed to an acceptable level.

Policy approach

- Avoid significant adverse effects on regionally significant surf breaks
- When considering resource consent applications for use or development in or adjacent to a Regionally Significant Surf Break, have regard to the effects on all mapped surf breaks

8.8.2 Relevant provisions

This evaluation supports the following Regional Plan provision:

- Policy D.5.26 - Significant Surf Breaks
- Policy D.5.27 - Managing effect on Surf breaks

8.8.3 The problem, opportunity and/or requirement

Surf breaks are unique and valuable components of the coastal environment. They have cultural, spiritual, recreational, and sporting value to approximately 198,000 people in New Zealand [37]. Surf breaks are becoming increasingly recognised in New Zealand policy, which is consistent with developments occurring internationally. [38]

An increased focus on mechanisms to protect surf breaks has resulted from numerous cases of degradation worldwide and a greater awareness of existing values. The argument for protection of surf breaks recognises that a range of benefits are associated with these unique places. These values depend on the integrity of natural processes, which influence surf break environments, and on a variety of aspects important to surf break users including accessibility and environmental health [39]

Council's are required to give effect to the New Zealand Coastal Policy Statement (NZCPS). Policy 16 of the NZCPS requires the protection of surf breaks of National Significance (Schedule 1 – includes several breaks at Ahipara on Northland's west coast).

There are a number of peer-reviewed journal articles that discuss coastal management and their implications for surfing (Nelsen et al., 2013; Scarfe et al., 2009; Corne, 2009; Oram and Valverde, 1994). These articles raise a number of points that are useful when considering how we manage our coastal resources. Firstly, two studies highlight that once surf breaks are destroyed, it is 'virtually impossible to replicate them or repair them[40][41]. Secondly, Corne (2009)[42] indicates that wherever coastal protection is constructed near a surfing resource, there is usually an impact. In other words, a change in sand

37 *Sport New Zealand. Sport and Active Recreation in the Lives of New Zealand Adults. 2013/14 Active New Zealand Survey Results.*

38 *Perryman P.B., and Orchard S., 2013. Understanding the values associated with New Zealand surf breaks and implications for management, Lincoln Planning Review, 4(2) (2013) 8-18.*

39 *Perryman P.B., and Orchard S., 2013. Understanding the values associated with New Zealand surf breaks and implications for management, Lincoln Planning Review, 4(2) (2013) 8-18.*

40 *Nelsen C., Cummins A., and Tagholm H. 2013. Paradise Lost: threatened waves and need for global surf protection. Journal of Coastal Research, Special Issue No 65, p904-908.*

41 *STC (Science and Technology Committee), 2011. Surfers as Coastal Protection Stakeholders. American Shore & Beach Preservation Society, Whit Paper. 9p.*

42 *Corne N. P., 2013. The Implications of Coastal Protection and Development on surfing. Journal of Coastal Research, 25(2): 427-434.*

movements can lead to changes to bathymetry, which flows on to changes in wave quality. Corne (2009) also indicates that engineered structures can change local hydrodynamics and bathymetry to the extent that waves can change from the plunging type to the lesser quality spiller type.[43]

Council is not aware of any development degrading surf breaks in Northland. However, there are several cases from around New Zealand that illustrate the risk that development can pose to surf breaks. The erection of a boat ramp and breakwater at Manu Bay, Raglan being a notable example:

> *"The Raglan headland is a unique surfing break where the dominant southerly swells are refracted and 'organised' to produce clean surfing waves from a westerly direction at the surfing breaks. The waves peel perfectly for surfing along the bolder/reef shoreline...However, the construction of a breakwater and boat ramp in the 1960s at the end of Manu Bay surfing break has shortened the length of the ride by up to 100m during certain conditions. The detrimental effect was caused by two activities. Firstly, according to discussions with local residents, the reef was either dredged or dynamited or both, creating a hole that stops waves breaking. Secondly, the constructed breakwater blocks wave energy."*[44]

Scarfe et al. (2009)[45] lists the main coastal activities and engineering structures that can alter wave quality and surf breaks as beach nourishment, port developments, jetties, outfall pipes, breakwaters, seawalls, piers, dredging, boat ramps, dumping of dredge spoil, marinas and groins. This list includes activities both seaward (offshore) and landward of surf breaks. Nelsen et al. (2013) [46] and Oram and Valverde (1994)[47] state that shoreline structures such as seawalls, revetments, jetties, groins and other structures may destroy surfing areas by reflecting, refracting or blocking waves and can compromise wave quality or create dangerous surfing conditions. Furthermore, it appears that the size and/or location of those structures are important factors to consider. For example, Scarfe et al. (2009a) [48] found that small engineered structures (boat ramp, and short breakwater) have negatively impacted the Manu Bay surf break in Raglan through alterations in seabed morphology (or bathymetry) and at a distance from the site of the engineering. Therefore, engineered structures do not have to be immediately next to surf breaks in order to impact upon them.[49]

While the discussion above focuses on the potential negative impacts of activities on surf breaks it is worth noting that some structures, either through good design or good luck, have improved or created surf breaks. Examples include New Pier in Durban, South Africa and Huntington Beach Pier, USA.

8.8.4 Management options

This section summarises the options for managing Regionally Significant Surf Breaks. The intention is not to identify every different combination of approach as there would be many, but to represent the range of options and highlight key differences in approaches.

The NZCPS provides clear direction on how Nationally Significant Surf Breaks are to be managed. Therefore the options considered in this report focus on policy for managing Regionally Significant Surf Breaks and activities that have the potential to affect these surf breaks.

Regionally Significant Surf Breaks were identified by using an expert panel with a strong knowledge of surfing in Northland[50].

Key terms

The following is an explanation of the key terms used in describing the options:

43 *Dr A. Dunn, 2013. Wainui Beach Management Strategy – surf break protection, June 2013.*

44 *ScarfeB.E., Healy T.R., Rennie H.G., and Mead S. T., 2009. Sustainable Management of Surfing Breaks – An Overview. Reef Journal 2009.*

45 *Scarfe B. E., Healy T. R., Rennie H. G., and Mead S. T., 2009a. Sustainable Management of Surfing Breaks: Case Studies and Recommendations. Journal of Coastal Research, 25(3): 684-703.*

46 *Nelsen C., Cummins A., and Tagholm H., 2013. Paradise Lost: threatened waves and need for global surf protection Journal of Coastal Research, Special Issue No.65,p904-908.*

47 *Oram W., and Valverde C., 1994. Legal Protection of Surf Breaks: Putting the Brakes on Destruction of Surf. Stanford Environmental Law Review, 13(2): 401-448.*

48 *Scarfe B. E., Healy T. R., Rennie H. G., and Mead S. T., 2009a. Sustainable Management of Surfing Breaks: Case Studies and Recommendations. Journal of Coastal Research, 25(3): 684-703.*

49 *Dr A. Dunn, 2013. Wainui Beach Management Strategy – surf break protection, June 2013.*

50 *Northland Regional Council, 2016. Methodology – Identifying Regionally Significant Surf Breaks in Northland.*

Surf break

A natural feature that is comprised of swell, currents, water levels, seabed morphology, and wind. The hydrodynamic character of the ocean (swell, currents and water levels) combines with seabed morphology and winds to give rise to a "surfable wave". A surf break includes the "swell corridor" through which the swell travels, and the morphology of the seabed of that wave corridor, through to the point where waves created by the swell dissipate and become non-surfable. "Swell corridor" means the region offshore of a surf break where ocean swell travels and transforms to a "surfable wave". "Surfable wave" means a wave that can be caught and ridden by a surfer. Surfable waves have a wave breaking point that peels along the unbroken wave crest so that the surfer is propelled laterally along the wave crest. [51]

Regionally significant surf break

A Regionally Significant Surf break is one that has a significance score higher than the regional significance threshold.[52]

Attribute

An attribute is a facet of the surf break's value. Taken collectively, attributes *describe* the surf break value. For example, surfing value may include the attributes of level of use, consistency and scenic attractiveness.

All the options below are policy-based options to be considered when development within and next to the coastal marine area is proposed. Activities that are likely to effect surf breaks will require resource consent. Therefore, it is not necessary to include a suite of rules triggering a resource consent process when development is proposed in an area that could effect a Regionally Significant Surf Break.

Option A: avoid significant adverse effects

Overview: the policy requires significant adverse effects to be avoided and other adverse effects to be avoided, remedied or mitigated.

*Background:*this approach is drawn from the approaches taken by Bay of Plenty Regional Council and Auckland Council.

Key policy approach
• Avoid significant adverse effects. • Avoid, remedy or mitigate other adverse effects. • Developers to provide information on the effects of development on identified surf breaks (within 1km of an identified surf break).

Option B: avoid, remedy or mitigate adverse effects

Overview: this option removes the upper threshold of avoiding significant effects, as set in Option A, and just focuses on avoiding, remedying and mitigating adverse effects.

*Background:*this option has been drawn from the proposed Greater Wellington Natural Resources Plan. In this plan, rather than "avoid remedy or mitigate" they use the phrase "minimise", which basically appears to be the same concept.[53]

Key policy approach
• Avoid, remedy or mitigate other adverse effects.

51 *New Zealand Coastal Policy Statement 2010.*

52 *The threshold applied to an indicator to determine high, medium and low relative importance for that indicator. Thresholds, where possible, are quantitatively defined.*

53 *See Policy P4 in the proposed Greater Wellington Natural Resources Plan.*

Option C: recognise the value of surf breaks

Overview: this option directs decision-makers to have regard to the values associated with a surf break, but does not direct them to take a particular action.

*Background:*this option is suggested by staff as an option to require the surf breaks to be considered but to provide more flexibility and discretion to decision-makers around how they manage the effects on surf breaks.

Key policy approach
When considering resource consent applications for use or development in or adjacent to a Regionally Significant Surf Break, have regard to the values of the surf break and the potential for adverse effects on those values.

8.8.5 Screening the management options

In this section we filter out any of the management options that are clearly not relevant or viable.

Option B: minimise adverse effect, is not a relevant option. While this option provides some direction to developers and decision-makers on how development should be managed in respect to Regionally Significant Surf Breaks, the direction to minimise adverse effects on the environment is inherent in the Resource Management Act. Therefore, the inclusion of the same direction within the proposed regional plan is not particularly helpful. Accordingly, the option is discounted.

8.8.6 High level objectives and measures

Section 32 requires an assessment of "*...the efficiency and effectiveness of the provisions in achieving the objectives...*". Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section Evaluation approach for more details.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. They signal a direction for where we want to head, without stating how far we go – that comes later (they are the beginnings of objectives).

Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against.

High level objective	Measure
Minimise impacts on Regionally Significant Surf Breaks.	Level of control over alteration, degradation or destruction of a Regionally Significant Surf Break by use and development. 1 = no control 2 = minor control 3 = moderate control 4 = significant control 5 = complete control

High level objective	Measure
Opportunity costs are minimised.	This is a measure of the opportunity costs that could occur as a result of restrictions. It is a constructed measure on how benefits of development are considered when compared to adverse impacts on Regionally Significant Surf Breaks. 1 = no ability apply to undertake activities that may effect Regionally Significant Surf Breaks – extreme opportunity cost. 2 = opportunity to apply to undertake activities that may effect Regionally Significant Surf Breaks, but significant weight given to protecting Regionally Significant Surf Breaks – significant opportunity cost. 3 = opportunity to apply to undertake activities that may effect Regionally Significant Surf Breaks, with moderate weight given to protecting Regionally Significant Surf Breaks – moderate opportunity cost. 4 = opportunity to apply to to undertake activities that may effect Regionally Significant Surf Break, with minor weight given to protecting Regionally Significant Surf Breaks – minor opportunity cost. 5 = no constraint to undertake activities that may effect Regionally Significant Surf Breaks – no opportunity cost.

Explanation for the high level objectives and measures

Minimise impacts on Regionally Significant Surf Breaks

This objective seeks to minimise adverse effects on identified Regionally Significant Surf Breaks and thereby preserve the recreational, social and economic values associated with their use for surfing. The measure is based on the level of control an option provides to council to manage activities that could potentially effect the values of these breaks. At one end of the scale (1) there are no controls on development. A moderate level of control would allow council to require methods to remedy or mitigate effects of development but not to decline the proposed activity based on its effects on a Regionally Significant Surf Break. A high level of control would enable council to put conditions in place to manage effects on Regionally Significant Surf Breaks or to decline resource consents based on those effects.

Opportunity costs are minimised.

A cost that could be incurred by developers is the cost associated with a development not occurring or being constrained as a result of a management option being included in the new Regional Plan. The measure reflects this by recognising that the more restrictions you place on a development, the less likely it is that the benefits of that development will be fully realised. An extreme example might be where our rules prohibit the removal or degradation of a Regionally Significant Surf Break, completely removing the option for development to occur where there is a risk to any of the identified Regionally Significant Surf Breaks. A more moderate example may be rules that allow for development to occur where there will be minor or temporary effects on the break but would prevent development that would destroy the break.

The information source for this measure is largely staff judgement.

High level objectives not included

Section 32 requires an assessment of the impacts on economic growth and employment opportunities (s32(2)(a)). However, the impact of the management options on economic growth and employment opportunities is imperceivable and/or can't be determined with any confidence. Therefore, economic growth and employment opportunities have not been included as high level objectives. For more information go to the section 1.7 'Assessing impacts on economic growth and employment opportunities'.

Contribution of surf breaks to the regional economy

There are several studies that investigate the contribution that surfing and surf breaks make to the economy, internationally and from New Zealand. Surfing can generate economic benefits from surfers within the region and from surf tourism. While there is no data available on the benefits of surfing to Northland, studies from other areas have found the benefits can be significant. For example, research on the potential economic impact of an artificial surfing reef at Mount Maungonui estimates that the relatively small reef that can cater for up to 50 surfers at a time could provide up to $500,000 to the local economy per annum[54].

On average, each surfer spends about $90 per surfing day to support his or her "habit," by the time petrol, food, surf gear and accommodation costs are added up. [55]

While the economic contribution of surf breaks is an important consideration we do not have the information available for this to be a viable measure.

8.8.7 Evaluating the management options

High level objective and measure	Option A: avoid significant adverse effects on Regionally Significant Surf Breaks	Option C: recognise the value of Regionally Significant Surf Breaks
Minimise impacts on Regionally Significant Surf Breaks. *Measure:* Level of control over alteration, degradation or destruction of a Regionally Significant Surf Break by use and development. 1 = no control. 2 = minor control. 3 = moderate control. 4 = significant control. 5 = extreme level of control over alteration, degradation or destruction of Regionally Significant Surf Break.	4	2

54 *Gough V.J, 1999. Assessing the economic effects of recreation facility development: Proposed artificial surfing reef, Mount Maunganui, New Zealand. Directed Research Project For Honours Degree in Social Sciences, University of Waikato, New Zealand.*

55 *Gough V.J, 1999. Assessing the economic effects of recreation facility development: Proposed artificial surfing reef, Mount Maunganui, New Zealand. Directed Research Project For Honours Degree in Social Sciences, University of Waikato, New Zealand.*

High level objective and measure	Option A: avoid significant adverse effects on Regionally Significant Surf Breaks	Option C: recognise the value of Regionally Significant Surf Breaks
Opportunity costs are minimised. *Measure:* 1 = no ability apply to undertake activities that may effect Regionally Significant Surf Breaks – extreme opportunity cost. 2 = opportunity to apply to undertake activities that may effect Regionally Significant Surf Breaks, but significant weight given to protecting Regionally Significant Surf Breaks – significant opportunity cost. 3 = opportunity to apply to undertake activities that may effect Regionally Significant Surf Breaks, with moderate weight given to protecting Regionally Significant Surf Breaks – moderate opportunity cost. 4 = opportunity to apply to to undertake activities that may effect Regionally Significant Surf Breaks, with minor weight given to protecting Regionally Significant Surf Breaks – minor opportunity cost. 5 = no constraint to undertake activities that may effect Regionally Significant Surf Breaks – no opportunity cost.	2-3	3-4

Certainty about the evaluation

There is always uncertainty about the potential impacts of management options.

The objectives and measures that we're most confident about the accuracy of are the ability decision-makers have to influence decisions based on the policy direction of options A and C.

While we are are confident about the tools/opportunities provided by the policies to consider surf breaks in resource management processes, we can not be sure how these policies will be weighed up against other policies in the new Regional Plan and what the ultimate outcome will be.

We're confident that evaluation is accurate enough to make a decision on the preferred option. We don't think it would be viable and/or worthwhile to get more information to increase the accuracy of our evaluation as it's unlikely to change the relative differences between the options.

Time-frame of the evaluation

The evaluation is made over the life-time of the plan (10-15 years).

The preferred management option

Options A and C take very different approaches; Option A sets a threshold for adverse effects, which determines a point at which adverse effects are unacceptable. Whereas, Option C requires the values of Regionally Significant Surf Breaks to be considered in resource management decisions. While they must be considered it does not require a particular action to be taken. This would provide more flexibility to decision-makers but provides less certainty in terms of surf break protection.

The preferred management option is Option A – avoid significant adverse effects on Regionally Significant Surf Breaks. This option will provide a level of protection to surf breaks, which are a natural resource that provides recreational, social and economic benefits to the region. This option does not provide absolute protection to the breaks scheduled in the new regional plan but it does provide for their consideration in resource management decisions in (and adjacent to) Northland's coastal marine area.

Consideration of Regionally Significant Surf Breaks will result in some costs to provide information on the risks of a proposed development on surf breaks scheduled in the New Plan. There may also be opportunity costs where a development can not manage its effects to meet the threshold set by the policy. Overall Option A provides the right balance to manage the risk to Regionally Significant Surf Breaks and the effects that could have on Northlanders with the opportunity and information costs that come along with this type of protection.

8.9 Dredging and disturbance

8.9.1 Executive summary

Dredging is a type of disturbance activity, regulated by section 12 of the RMA, which is often carried out to:

- Enable the development of new activities such as ports, marinas and wharves (known as 'capital' dredging).
- Maintain previously dredged areas (such as navigation channels) – commonly known as 'maintenance' dredging.
- Clear, cut or realign tidal stream mouths.
- Provide for the operation of land drainage channels and stormwater pipes.

The main effects of dredging are:

- The physical destruction and/or removal of any benthic aquatic life within the dredged area.
- Changes to water movement patterns in an area.
- The re-mobilisation of sediment and associated reduction in turbidity.

Dredging (especially maintenance dredging) is often required to enable the on-going use of areas by existing activities (for example, to maintain adequate water depth in navigation channels). It may also be necessary to enable the development of new activities of regional importance (such as marinas or ports/wharves) as well as to avoid adverse effects (such as the unblocking of tidal stream mouths).

Three different 'packages' of options to manage dredging and disturbance-related activities are evaluated: rolling over the status quo (existing provisions in the Regional Coastal Plan) as well as comparatively 'heavier' and 'lighter' regulatory approaches.

Option C (lighter regulatory approach) came out as the preferred management option because it best strikes a balance (relative to the other options) between enabling the economic and social well-being of communities to be enhanced (through dredging/disturbance activities) and protecting environmental bottom lines. The rules and key policy approach for this management option are summarised in the following table.

Significant disturbance activities	Beach scraping	Maintenance dredging	Vehicles on beaches	Clearing stormwater pipes	Clearing tidal stream mouths	Clearing artificial land drainage channels	Key policy approach
Non-complying in 'significant' areas and discretionary elsewhere.	Restricted discretionary	Controlled.	Permitted	Permitted.	Permitted.	Permitted.	Guidance on when deposition and disturbance activities within significant marine areas may be appropriate. General requirement to avoid disposal of dredge spoil and waste in the coastal marine area. Guidance on underwater noise.

8.9.2 Relevant provisions

This evaluation supports the following Regional Plan provisions for dredging and disturbance activities:

- Rules - C.1.5 Dredging and disposal (entire section)

- Rule - C.1.8 Coastal Works General Conditions
- Policy - D.2.3 Application of policies in the Regional Policy Statement for Northland to non-complying activities
- Policy - D.5.18 Dredging, disturbance and deposition activities
- Policy - D.5.19 Disposal of dredge spoil material
- Policy - D.5.20 Dredging, disturbance and deposition - effects on areas with significant values
- Policy - D.5.21 Underwater noise

8.9.3 The problem, opportunity and/or requirement

Types of dredging and disturbance activities within the coastal marine area

Dredging is a type of disturbance activity, regulated by section 12 of the RMA, and is often carried out for the following purposes:

- To enable the development of new activities such as ports, marinas and wharves (known as 'capital' dredging).
- To maintain previously dredged areas (such as navigation channels) – commonly known as 'maintenance' dredging.
- To clear, cut or realign tidal stream mouths.
- To provide for the operation of land drainage channels and stormwater pipes.

The main effects of dredging are:

- The physical destruction and/or removal of any benthic aquatic life within the dredged area.
- Changes to water movement patterns in an area.
- The re-mobilisation of sediment and associated reduction in turbidity. This is a bigger issue in summer when turbidity is naturally lower, animals are present/reproducing and there is an increased desire to use Northland's coast for recreational purposes.

Dredging (especially maintenance dredging) is often required to enable the on-going use of areas by existing activities (for example, to maintain adequate water depth in navigation channels). It may also be necessary to enable the development of new activities of regional importance (such as marinas or ports/wharves) as well as to avoid adverse effects (such as the unblocking of tidal stream mouths).

Clearing of stormwater pipes

The RMA states that if there is no relevant rule in the coastal plan for an activity and Part 3 (section 12 in particular) requires a resource consent to be obtained, the activity must be treated as an application for a resource consent for a discretionary activity.

The 10 year review of the regional coastal plan [56] found that resource consent is required for clearing stormwater pipe outlets (for example, when they get blocked up with sand)[57]. As there is no specific rule in the regional coastal plan, this is treated as a 'discretionary' activity, however, the environmental effects of undertaking this activity are generally minor and the activity of clearing blocked pipes is a way of avoiding significant risks.

Use of heavy machinery

The regional plan review also found that the use of heavy machinery or equipment on the foreshore (for example, in association with the maintenance of existing structures) requires a resource consent[58][59] There are many instances where the adverse effects are minor or temporary, and requiring resource consent in these instances is overly onerous. This is particularly the

56 http://www.nrc.govt.nz/contentassets/0d3e217aec2346549fdbd0b3e579c501/regional-plan-review-summary---coastal-water-space.pdf
57 See page 5 of coastal water space topic.
58 See page 6 of coastal water space topic.
59 http://www.nrc.govt.nz/contentassets/0d3e217aec2346549fdbd0b3e579c501/regional-plan-review-summary---coastal-water-space.pdf.

case for maintenance of structures, which is a permitted activity but if it involves the use of heavy machinery on the foreshore/seabed, it defaults to a discretionary activity. This matter is explored further in 8.4 'Structures, use and development', within this Section 32 analysis.

Use of vehicles on beaches

The operative Regional Coastal Plan takes a permissive approach to recreational activities on foreshore areas as well as to the use of recreational vehicles on beaches - subject to compliance with standards/conditions. Inappropriate use of vehicles within the coastal environment has the potential to result in the destruction of indigenous vegetation as well as disturb the roosting or breeding of indigenous bird species. Vehicle use within the dune environment has the potential to destroy the protective functions of dunes and disturb sites of significance to tangata whenua.

Mineral extraction

Sand is extracted for use with aggregate in concrete manufacture and other construction activities. Depending on the nature of the extraction, the effects of extraction include disturbance and destruction of the foreshore and seabed habitats, disrupted recreational uses and a reduction in natural character and amenity values including noise impacts from the operation.

The potential exists for other minerals to be extracted from the coastal marine area including oil. Oil extraction often comes with the potential for low probability and high impact risks where there is, for example, the rupture of a well. There is also the possibility for less dramatic effects including contamination from drilling fluids and accidental spillages of hazardous substances into water. Marine seismic surveying, which is used in the initial stages of exploration to locate the oil resource, can confuse and disorientate marine mammals. Most current oil exploration is however taking place well outside of the limit of the territorial sea and is unlikely to be a feature of the immediate coast in the next 10 years.

Other disturbance activities

These include beach grooming/scraping and piling for new structures. Some of these activities are carried out to alleviate problems that threaten public safety and others are designed to improve the amenity values of the coastal environment and improve public access. Many of these activities may have a component both above and below mean high water springs (crossing the jurisdictions of both the regional council and territorial authorities).

Deposition

The disposal of material in the coastal marine area has adverse effects on the coastal environment. The Resource Management (Marine Pollution) Regulations (1998) identify the following waste or other matters as being material that may be considered for disposal in the coastal marine area:

- Dredged material;
- Sewage sludge;
- Fish processing waste;
- Ships and platforms and other man-made structures;
- Inert, inorganic material;
- Organic material of natural origin; and
- Other bulky items of inert materials such as iron, concrete, and steel.

The dumping of waste or other matter not mentioned above is deemed to be a prohibited activity in regional coastal plans. In most cases, the purpose of disposing of material is to get rid of it; however some disposal can also have other purposes such as providing recreational amenity, for example, the sinking of a vessel for diving opportunities.

Underwater noise

The operative Regional Coastal Plan does not address the issue of underwater noise and refers only to s322 of the RMA and 'excessive noise'. Underwater noise and vibration has different effects to noise occurring out of the water. It may, for example, impact on marine mammals by serving to confuse and disorientate them. Underwater noise may arise from the use of machinery, vibratory piling and drilling, blasting, marine seismic surveying and general disturbance.

8.9.4 Management options

This section summarises the suite of management options for disturbance (including dredging), deposition and related activities. The intention is not to identify every different combination of approach as there would be many, but to represent the range of options and highlight key differences in approaches.

The options focus on the activity status for significant disturbance activities, 'maintenance' dredging, use of vehicles on beaches, clearance of stormwater pipes, tidal stream mouths and artificial land drainage channels. Three options are presented: rolling over the status quo provisions in the existing regional coastal plan and then a comparatively 'heavy' and 'light' regulatory approach.

Common to options B and C, significant disturbance activities would include both capital dredging and mineral extraction under this 'umbrella' (they are treated separately under current rules). As significant disturbance activities may potentially give rise to a large amount of underwater noise, it is intended that it be made explicit in the new plan that this is covered by these provisions (the current plan is silent on this). In addition, policy should ensure noise effects are considered (particularly on marine biodiversity values).

There are some provisions in the current regional plans that we don't think need changing and are unlikely to be contentious. Also, there are some new provisions we think are obvious for the new Regional Plan. The following is a list of these uncontentious and obvious provisions that will be implemented regardless of the option selected:

- Policy guidance will require extracted material, including dredge spoil to be disposed of outside the coastal marine area unless not practicable.
- Disposal of waste, including the disposal of dredge spoil in the coastal marine area will be a 'discretionary' activity. This is pursuant to Policy 4(2) of the Resource Management (Marine Pollution) Regulations 1998.
- Burial of animals (including marine mammals) will be a 'permitted' activity. This is the current activity status and no reasons have been raised as to why this should move to a consenting regime.
- Small-scale sampling and scientific investigation, including removal of sand and gravel will be a 'permitted' activity in the general coastal marine area.
- All activities that are permitted are subject to compliance with conditions.
- There will be no specific rules for underwater noise. It will be managed when a resource consent is triggered for another activity, with guidance on managing adverse effects of underwater noise managed through a specific policy that applicants will be required to take into account.

Key terms

An explanation of the key terms used in describing the options.

Beach scraping

The transfer of material (generally sand) from the lower part of the foreshore (beach, usually by mechanical equipment, to re-distribute the sand to the upper beach/dune system, in order to repair or restore natural dune/beach protection.

Maintenance dredging

Excavating material from the bed of the coastal marine area and removing the excavated material, where the excavation is for the purpose of removing accumulated sediment so that the seabed is returned to previously approved (consented) levels.

Significant marine areas

These are the outstanding/nationally significant areas described in policies 11(a) (biodiversity), 13(1) (natural character), 15(a) (natural features and landscapes) and 16(b) (surf breaks) of the New Zealand Coastal Policy Statement 2010. These policies direct that adverse effects on the prescribed matters must be avoided. In this context, the Policy 11 considerations include mapped Significant Ecological Areas and Significant Marine Mammal Areas.

Significant disturbance activities

This is an umbrella term for capital dredging and mineral extraction activities (such as sand mining). It does not include maintenance dredging or smaller-scale dredging/clearance activities (such as clearance of artificial land drainage channels).

Option A: roll over existing provisions in the Regional Coastal Plan related to disturbance, dredging and associated activities.

Overview: minor dredging and disturbance activities are generally permitted or controlled activities and more significant activities are discretionary or non-complying activities. Activities that are not expressly provided for by rules (such as clearing of stormwater pipes or beach scraping) default to a discretionary activity, pursuant to section 87B of the RMA.

Background: this option is based on the approach in the operative Regional Coastal Plan.

Significant disturbance activities	Maintenance dredging	Use of vehicles on beaches	Clearing stormwater pipes	Clearing tidal stream mouths	Clearing artificial land drainage channels	Key policy approach
Capital dredging – non-complying in significant areas and discretionary in General Coastal Zone. Mineral extraction – discretionary. Other disturbance and deposition – discretionary.	Controlled within Whangārei Harbour and Veronica Channel in Bay of Islands, otherwise discretionary.	Permitted	No rule so Discretionary.	Controlled for district councils. Discretionary otherwise.	Permitted but controlled in 'significant marine areas' (both subject to conditions).	Discourage capital dredging unless associated with marina, port or commercial wharf activity. Generally discourage mineral extraction and other large-scale disturbance and deposition in significant areas. Generally allow clearance of artificial land drainage channels and tidal streams to avoid flooding or release natural impoundments that may cause a public health risk.

Option B: heavier regulatory approach.

Overview: most activities are 'discretionary' under this regime – there are no controlled or permitted activities, meaning it is the least 'enabling' of options tested.

Background: this package outlines what a heavy regulatory approach would look like for disturbance and deposition activities. No councils in the country have (or are proposing) rules this restrictive. This is merely illustrating how a heavy-handed approach would look.

Significant disturbance activities	Maintenance dredging	Beach scraping	Vehicles on beaches	Clearing stormwater pipes	Clearing tidal stream mouths	Clearing artificial land drainage channels	Key policy approach
Prohibited in significant marine areas, non-complying in General Coastal Zone and discretionary in development (port, wharf and moorings/marina) zones.	Discretionary.	Discretionary	Discretionary	Discretionary.	Discretionary.	Discretionary.	Strongly discourage significant disturbance and deposition outside development zones.

Option C: lighter regulatory approach.

Overview: Significant disturbance activities would generally be a discretionary activity, except in significant marine areas where they would be non-complying activities. Maintenance dredging is a controlled activity. Clearing of stormwater pipes, stream mouths and artificial land drainage channels would all be 'permitted' activities (subject to compliance with conditions).

Background: this package outlines what a lighter regulatory approach would look like for disturbance and deposition activities. It is similar to how other councils (such as Auckland Council and Greater Wellington Regional Council) have treated dredging and disturbance activities in their second generation plans.

Many submitters on the draft Regional Plan supported this suite of provisions, especially the suggested permitted activity rules. Several submitters requested that the new plan define 'maintenance dredging' (the draft did not define this). Quite a few submitters (including Whangarei District Council and NZ Transport Agency) suggested that the new plan needs to include provisions regulating the use of vehicles on beaches (the draft plan did not contain provisions to regulate these activities).

Significant disturbance activities	Maintenance dredging	Beach scraping	Vehicles on beaches	Clearing stormwater pipes	Clearing tidal stream mouths	Clearing artificial land drainage channels	Key policy approach
Non-complying in significant marine areas and discretionary elsewhere.	Controlled	Restricted - discretionary	Permitted	Permitted.	Permitted.	Permitted.	Guidance on when deposition and disturbance activities within significant marine areas may be appropriate. General requirement to avoid disposal of dredge spoil and waste in the coastal marine area. Guidance on underwater noise.

8.9.5 High level objectives and measures

Section 32 requires an assessment of "*...the efficiency and effectiveness of the provisions in achieving the objectives...*". Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section 1.6 'Evaluation approach' for more details.

High level objectives:

- Capture the fundamental things (or values) that matter to people (the key costs and benefits) when determining the best management option.
- Signal a direction for where we want to head, without stating how far we go – that comes later.
- Are what the management options are assessed against to determine their efficiency and effectiveness (s32(1)(b)(ii)).
- Are not 'objectives' as referred to in the RMA.

Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against.

High level objective	Measure
Minimise likelihood of significant disturbance activities having adverse effects on values and characteristics of significant marine areas.	Likelihood of adverse effects on significant marine areas occurring from any particular dredging or disturbance proposal:

High level objective	Measure
	1 = High. 2 = Moderate. 3 = Low. 4 = Very low. 5 = None.
Maximise certainty and minimise regulatory costs to dredging/disturbance proponents.	Resource consent activity status and cost: 1 = non-complying (typically limited or fully notified) = $3144. 2 = discretionary (typically non-notified) = $839. 3 = controlled (typically non-notified) = $839. 4 = permitted activity = not applicable (no cost).

Explanation for the high level objectives and measures

Minimise likelihood of significant disturbance activities having adverse effects on significant marine areas.

This objective focusses on potential adverse effects on the areas described in policies 11(a), 13(1)(a), 15(a) and 16(b) of the New Zealand Coastal Policy Statement 2010. These policies direct that adverse effects on the prescribed outstanding matters must be avoided. King Salmon has determined that there is little flexibility, that is, it is a bottom line. This contrasts to effects on other uses and values where there is more scope for trading-off.

The scale is the likelihood of any particular dredging/disturbance activity causing adverse effects on significant marine areas (ranging from high, which could be viewed as a 'permitted' activity – with a score of '1'; to no adverse effects, which can be viewed as a 'prohibited' activity, with a score of '5'. It is a judgment call that will generally be based on the strength of the policy and the extent it will be given effect. The key 'test' for significant areas is whether adverse effects will occur – as that's the bar set by the New Zealand Coastal Policy Statement 2010. Also, the reality is that if adverse effects are allowed, they would unlikely be more than minor. In other words, given the New Zealand Coastal Policy Statement 2010, it is very unlikely that resource consent would be granted allowing more than minor adverse effects on significant marine areas.

Maximise certainty and minimise regulatory costs to dredging/disturbance proponents.

This objective has been chosen because dredging and disturbance activities (in appropriate circumstances and locations) have the potential to provide significant benefits (primarily economic and social) to the region. Examples include, when they are associated with port activities, the creation of new marinas as well as maintenance dredging of harbour channels. Extraction of sand, gravel and other minerals can also provide significant economic and social benefits. The objective therefore looks to maximise certainty and minimise regulatory costs for those carrying out the prospective activity. This also includes 'minor' clearance activities such as tidal stream mouths and stormwater pipe outlets. This is because, if a resource consent is required for minor clearing activities, there is an associated 'hassle' factor for applicants (normally district councils) and during the time it may take to get the relevant RMA consent, a risk of harm may arise – either through flooding of land adjacent to the river or drainage channel or to public health and safety through streams/rivers becoming stagnant.

The scale of the measure therefore looks at resource consent activity status and associated cost. The scores range from '1' a 'non-complying activity that is subject to full public notification and no guarantee of getting consent, to '4' a permitted activity with no cost and a high level of certainty.

High level objectives not included.

Section 32 requires an assessment of the impacts on economic growth and employment opportunities (s32(2)(a)). However, the impact of the options on these is imperceivable and/or can't be determined with any confidence. Therefore, economic growth and employment opportunities have not been included as high level objectives. For more information go to the section 1.7 'Assessing impacts on economic growth and employment opportunities' (which is in the Section 32 Introduction section).

8.9.6 Evaluating the management options

High level objective	Option A: roll over status quo	Option B: heavy regulatory approach	Option C: lighter regulatory approach
	Evaluation	Evaluation	Evaluation
Minimise likelihood of significant disturbance activities having adverse effects on values and characteristics of significant marine areas. *Measure:* Likelihood of adverse effects on significant marine areas occurring from any particular dredging or disturbance proposal. 1 = High. 2 = Moderate. 3 = Low. 4 = Very low. 5 = None.	4	5	4
Maximise certainty and minimise regulatory costs to dredging/disturbance proponents. *Measure:* Resource consent activity status and cost. 1 = non-complying (typically limited or fully notified) = $3144. 2 = discretionary (typically non-notified) = $839. 3 = controlled (typically non-notified) = $839. 4 = permitted activity = not applicable (no cost).	3 for 'minor' disturbance activities and 2 for significant disturbance activities.	2 for 'minor' disturbance activities and 1 for significant disturbance activities.	4 for 'minor' disturbance activities and 2 for significant disturbance activities.

Certainty about the evaluation

There is always uncertainty about the potential impacts of management options. We're moderately to highly confident about the accuracy of the evaluation for both objectives. The second objective directly relates to resource consent activity status and associated cost. There is less certainty regarding the first objective but we don't think it would be viable and/or worthwhile to get more information to increase the accuracy of our evaluation. The main reason being that it is very unlikely to change the relative differences between the options. They are a judgement and inherently a judgement of people's responses has a degree of uncertainty.

Time-frame

The evaluation is made over the life-time of the plan (10-15 years).

The preferred management option

The preferred management approach is Option C: lighter regulatory approach.

Option C (lighter regulatory approach) is the preferred management option because it best strikes a balance (relative to the other options) between enabling the economic and social well-being of communities to be enhanced (through dredging/disturbance activities) and protecting environmental bottom lines. This option scored slightly worse than Option B against the first objective but a 'non-complying' activity status is still a very high bar to pass (and there will be strong policy requirements to avoid adverse effects on the values/characteristics of the significant areas), meaning that the likelihood of adverse effects impacting the values and characteristics of significant marine areas will be low.

Option C scored the best against the second objective. All small-scale disturbance activities will be 'permitted activities' under this option, meaning no cost for applicants to undertake the works as well as minimal 'hassle'. Significant disturbance activities outside of significant marine areas will be a discretionary activity. Greater weight has been afforded to this objective because it is considered that there is a low chance of significant disturbance activities actually getting the green light within significant marine areas, primarily because of the New Zealand Coastal Policy Statement's requirement to avoid adverse effects within these areas.

Option B (heavier regulatory approach) is not the preferred option. It naturally scored best against the first objective, as significant disturbance activities would be prohibited under this option, meaning there is no opportunity to even apply for a resource consent. It however scored the worst against the second objective. This option would require gaining resource consent (as a discretionary activity) for clearing of stormwater pipes, tidal stream mouths and artificial land drainage channels. There would therefore be a financial cost to get the necessary resource consents and an associated 'hassle', especially if the works are required to be undertaken urgently to remedy problems (such as sand blockages).

Rolling over the 'status quo' (Option A) did not rank as the preferred approach because, as a package, Option C offers a more enabling approach to smaller-scale disturbance activities, while offering more protection from larger-scale disturbances in significant marine areas. Smaller-scale disturbances are far more common activities than 'significant' disturbance activities and therefore the preferred option is one of less restriction.

8.10 Marine pests

8.10.1 Executive summary

This section evaluates the options for managing marine pests in the new Regional Plan. The relevant Regional Plan provisions are rules in section C.1.7 'Marine Pests' and Policy D.5.25.

Northland has a very large marine environment and includes areas recognised nationaly and internationaly for biodiversity values such as Poor Knights Islands, Spirits Bay and Pārengarenga Harbour. Indigenous ecosystems and species and the continued availability of a plentiful, diverse and healthy marine environment are highly cherished and recognised by Northlanders and visitors alike for recreation, food, amenity, and both economic and spiritual values.

Marine pests can be managed under the RMA (through regional plans) and under the Biosecurity Act 1993 through regional 'pest' and 'pathway' management plans. The New Zealand Coastal Policy Statement 2010 and the Regional Policy Statement call for pest management provisions in regional plans. Information on the Proposed Northland Regional Pest and Marine Pathway Management Plan 2017-2027 can be found on council's website. There is a need for consistency between these regulatory approaches. While there is some overlap between these two legal frameworks, they manage pests in different ways – see the following table.

Legislation	Main ways marine pests can be managed	Control measures available
RMA	Regional Coastal Plan provisions managing discharge and disposal activities, construction and maintenance of coastal structures and aquaculture.	Rules prohibiting or requiring resource consent for high risk activities. Conditions in resource consents to assist with managing the risk of adverse effects caused by marine pests and can therefore take a preventative approach.
Biosecurity Act 1993	Regional pest management plans.	Presence of a ranked pest organism, and are therefore by nature responsive not pro-active. Pest species are identified that threaten cultural, environmental, social or economic values. These species are ranked into response categories ranging from total exclusion/eradication to action aimed at lessening some of the impacts.
Biosecurity Act 1993	Pathway management plans.	Able to target ways of reducing the spread of pest species (including across regional boundaries) by identifying and managing risks and parties involved. They may include rules to achieve identified objectives.

Marine pest management is currently a weakness in the Regional Coastal Plan. While there are some references to invasive species/exotic organisms (such as a rule preventing deliberate release of exotic organisms), this tends to be reactive and adds little to measures available under the Biosecurity Act 1993.

We have used a broad definition for '*marine pest*' to account for the potential of species that are new to New Zealand and the spectrum of non indigenous species that range from species capable of causing significant adverse effects to those of low risk. We have proposed that it be a non-complying activity to reflect to the range of potential adverse effects. This activity status is proposed regardless of what management option is adopted.

Marine pests are a major threat to Northland's coastal environment. A number of activities regulated by the RMA may result in their introduction or spread. The introduction and spread of marine pests is most likely to be associated with the movement and cleaning of contaminated vessels (and ballast water), equipment and stock, especially those originating from outside the region. Fishing equipment and marine farming equipment and stock also pose a risk for the introduction and spread of marine pests. Vessel hull fouling is responsible for around 70% of marine pest introductions in New Zealand.

While marine pests can be spread and introduced in a number of ways, the main risk is from vessels and this is therefore the focus of the plan provisions for marine pests. The management options evaluated lay out three approaches managing in-water cleaning of vessels and each has been considered with or without 'vessel bio-fouling' rules. The biofouling rules re-enforce controls proposed in the Northland Regional Pest and Marine Pathway Management Plan 2017-2027 and enable use of RMA provisions and tools. In particular RMA infringement notices provide a useful deterrence (e.g. $500 fine much like a speeding ticket) and is likely to result in a higher compliance rate.

'Hull cleaning' as this is the most practical way to manage the movement of marine pests. The "Level of fouling" scale developed by Floerl et al 2005 [60] has been used as the basis of determining fouling extent and risk ranging from LOF0 (no fouling), LOF1 (slime layer only), LOF2 (light fouling / 1-5% hull cover) to LOF5 (very heavy fouling / 41-100% hull cover).

Costs and benefits for managing vessel hull fouling at different levels was assessed under the Proposed Northland Regional Pest and Marine Pathway Management (Pathways Plan) as highlighted in the figure below:

Comparison of benefits and costs for different vessel hull fouling levels

	Management regime						
	Current	LOF-4	LOF-3	LOF-2 - with movement controls	LOF-2	LOF-1	LOF-0
Benefit ($M)	$9.2	$25.9	$64.3	**$70.0**	$67.2	$52.3	$41.2
Private costs ($M)	$0	$1.6	$8.4	**$9.0**	$17.3	$31.7	$57.6
Public costs ($M)	$3.3	$4.5	$4.7	**$4.9**	$6.1	$9.9	$11.4
Total Cost ($M)	$3.3	$6.1	$13.1	**$13.9**	$23.4	$41.6	$69.1
Net benefit ($M)	$5.9	$19.8	$51.2	**$56.1**	$43.8	$10.8	-$27.9
Benefit / Cost ratio	2.8	4.2	4.9	**5.0**	2.9	1.3	0.6

The preferred option of the Pathways Plan (bold text) manages vessels arriving in Northland and the movement of vessels between designated 'places' (areas consisting of a single or combination of harbours and bays) with greater than LOF2 (light fouling).

The preferred option for the new Regional Plan permits in-water cleaning in development zones and achieves enhanced biofouling management by reinforcing Pathways Plan provisions:

60 *Floerl O, Inglis G, Hayden B, May 2005 'A Risk-Based Predictive Tool to Prevent Accidental Introductions of Nonindigenous Marine Species', Environmental Management Vol. 35, No. 6, pp. 765–778*

Bio-fouling on vessel hulls	In water cleaning - development zones	In water cleaning - outside development zones	Key policy approach
Permitted level of fouling = 0 - 2 with movement restrictions.	LOF2 (light fouling)	Discretionary.	Permitting low risk in-water cleaning and bio-fouling.

8.10.2 Relevant provisions

This evaluation supports the following Regional Plan provisions:

- Rules - C.1.7 Marine Pests
- Policy - D.5.25 Marine Pests

8.10.3 The problem, opportunity and/or requirement

Northland has the greatest marine biodiversity in New Zealand due to its exposure to two major ocean systems, an impressive array of islands and estuaries, and a complex, indented, semi-sheltered east coast [61]. The regions marine environment is also very large and includes areas recognised nationally and internationally for biodiversity values, such as Poor Knights Islands and Pārengarenga Harbour. Indigenous ecosystems and species and the continued availability of a plentiful, diverse and healthy marine environment is highly cherished and recognised by Northlanders and visitors alike for recreation, food, amenity, and both economic and spiritual values.

There are marine pests elsewhere in New Zealand and many other species overseas that, should they arrive, could quickly establish, spread, cause adverse effects and be very difficult to eradicate. The arrival of Mediterranean fanworm (*Sabella spallanzanii*) is a case in point, having been first discovered in New Zealand in Lyttelton Harbour in March 2008 and then in Waitamata Harbour in August 2009, and although it is not known whether this incursion originated from one or more vessels, it is likely to either have been via hull fouling or possibly ballast water [62] . Mediterranean fanworm was first detected in Northland in April 2012 in Whangārei Harbour, both at Port Nikau and Marsden Cove. In each of the past 4-5 years, council has budgeted approximately quarter of a million dollars (that is, more than $1 million in total) on the control and management of marine pests (mainly Mediterranean fanworm).

In 2013, aquaculture, fishing and related processing in Northland was estimated to have produced more than $18.5m in regional GDP and directly employed more than 380 people [63] . The majority of employment in the industry is in the Far North (59%) and Whangārei (31%) districts[64]. Aquaculture activities include mussel spat collection from seaweed at Te Oneroa a Tōhe (Ninety Mile Beach), which has at times supplied more than 75% of seed to New Zealand's mussel farms. Marine pest incursions are a threat to the production and costs of these activities. Known current threats to the aquaculture

61 *Conservation Management Strategy Northland 2014-2024*

62 *Geoffrey B. Read, Graeme Inglis, Peter Stratford and Shane T. Ahyong, National Institute of Water and Atmospheric Research (NIWA). Arrival of the alien fanworm Sabella spallanzanii (Gmelin, 1791) (Polychaeta: Sabellidae) in two New Zealand harbours, NIWA, Christchurch, New Zealand.*

63 *Ministry for Primary Industries, 2015. Tai Tokerau Northland Growth Study*

64 *MPI, 2015. Tai Tokerau Northland Growth Study*

industry include Styela clava [65] and mediteranian fanworm [66]. There will also be considerable cost to other organisations, businesses such as marinas and individuals associated with marine pest control. [67]Northland Regional Pest and Marine Pathway Management Plan Cost Benefit Analysis Report March 2017 [68].

The intrinsic value of Northland's marine environment that is at risk from marine pests is difficult to quantify because of the need to consider non-economic values and the uncertainty about the impacts of pest species. An estimate of $1 billion per year has been derived using ecosystem service values per hectare for different marine ecosystem biomes obtained from a national study [69][70] and their respective areas found in Northland [71] and recent GIS data [72].

As a result of marine pest threats and associated costs, many of the North Island east coast marinas [73] have introduced marina access control measures designed to help control the spread of marine pests from hull fouling. Vessel owners and operators wishing to use these marinas are given the option of either proving adequate anti-fouling or hull cleaning. These measures are known as the '*six or one rule*' where people need to provide evidence that their vessel has been:

- Hulled out and anti-fouled in the last six months; or
- Lifted and washed within one month.

Regional council supports the 'Six or One' measures. Further measures are necessary as highlighted by recent data [74][75] that points to effective risk reduction from introduction and spread of marine pests as requiring a very high uptake of control measures and not just targeting the worst offenders.

Regional council currently manages marine pests almost exclusively through its Biosecurity Act 1993 functions. Northland's biosecurity controls have been revised in the Proposed Northland Regional Pest and Marine Pathway Management Plan 2017-2027 (see the council website). This plan sets requirements specific to particular pest species and also controls hull and niche area fouling by limiting it to 'light fouling' on vessels arriving in Northland or travelling between designated 'places'.

While both the RMA and Biosecurity Act have functions that enable the management of activities to control the introduction, spread and removal of pests, the scope and purpose for doing this differs:

- The Biosecurity Act deals with exclusion, eradication and management of pests through controlling pests and the management of vectors that might spread those pests; whereas
- The RMA, regulates activities in the coastal which can have adverse effects on recognised values.

Reasons for considering marine pest controls in the new coastal plan (that is, under the RMA) rather than relying on Biosecurity Act controls also include:

- Policy 12 of the New Zealand Coastal Policy Statement (coastal policy statement) provides clear direction for regional council's to include marine pest (harmful aquatic organism) related, plan provisions.

65 *Gust N., Inlis G., Peacock L., Miller S., Floerl O., Hayden B., et al., 2006. Rapid nationwide delimitation surveys for Styela clava. NIWA Client Report No. CHC2005-24. Prepared for Biosecurity New Zeraland Project ZBS2005-32. NIWA, Christchurch, p.81.*

66 *Inglis G. J., Woods C. M. C., Willis K., Read G., Seaward K., 2008. Incursion response to the Mediterranean Fanworm Sabella spallanzanii (Gmelin, 1791), in the Port of Lyttelton – Interim Measures. NIWA Client Report: CHC2008-141 prepared for MAF Biosecurity NZ contract MAF09501, 78p.*

67 *A benefit-cost model for regional council marine biosecurity pathway management by Barrie Forrest, Jim Sinner, Cawthron Institute, 27 January 2016, prepared for Northland Regional Council. Please note that with the availability of additional Northland data this has been further developed*

68 *Economic Analysis Fiordland Marine Area Pathways Management Plan, report prepared by Simon Harris, LWP Ltd., for Environment Southland. October 2015.*

69 *Marjan van der Belt and Anthony Cole, 2013. "Ecosystem goods and services in marine protected areas (MPAs)", Science for Conservation 326, Department of Conservation.*

70 *Murray Patterson and Anthony Cole (2013), "Total Economic Value' of New Zealand's land-based ecosystems and their services", in Dymond J.R. (ed.) Ecosystem services in New Zealand - conditions and trends, Manaaki Whenua Press, Lincoln.*

71 *Vince Kerr (2010), Marine Habitat Map of Northland: Mangawhai to Ahipara Vers. 1. Technical Report, Department of Conservation, Northland Conservancy, Whangārei.*

72 *GIS data from Vince Kerr & Associates (2016). Mapping of significant ecological areas in Northland – prepared for Northland Regional Council, Draft Regional Plan*

73 *In Northland these include: Whangaroa, Bay of Islands (Ōpua), Kerikeri, Tutukākā and the three Whangārei Harbour marinas: Marsden Cove, Whangārei and Riverside Drive.*

74 *Northland Regional Council vessel hull monitoring 2015-2016;*

75 *Oliver Floerl, Graeme J. Inglis and Jan Diettrich, Incorporating human behaviour into the risk-release relationship for invasion vectors: why targeting only the worst offenders can fail to reduce spread. Journal of Applied Ecology 2016, National Institute of Water and Atmospheric Research, Christchurch, New Zealand; and Cawthron Institute, Nelson, New Zealand.*

- The infringement notice is particularly effective at acting as a deterrent without the need for more complex compliance measures. They usually attract a fine of $500.
- Guidance on the Biosecurity Act 1993 National Policy Direction describes interaction between the Biosecurity Act 1993 and other legislation states: "*...co-ordinating and aligning pest management outcomes is central to the Pest Management National Plan of Action.*" It also notes that: *"Where (activities) contribute to common goals, alignment can help all parties better achieve their goals."* As an example, it refers to the coastal policy statement implementation in coastal plans through controls on the movement of marine pests by hull fouling, structures, and aquaculture stock and equipment. NZ Coastal Statement Policy 4 reiterates this approach providing for 'integrated management' of natural resources.
- In water, cleaning of hull fouling is a major component of marine pest management with approximately 70% of marine pest introductions in New Zealand being attributed to hull fouling [(76)(77)]. However, the associated discharge of hazardous substances whenever soft (ablative) anti-fouling paints are wiped, is controlled under RMA planning provisions (as in the current coastal plan) and not under the Biosecurity Act 1993.
- Regional plans are 'activity-based' and pathway plan provisions address risk of transportation or movement of marine pests. If marine pests are just managed under the Biosecurity Act approach, this could produce a gap in the management of marine pest issues. For example, through the resource consent process the RMA provides a mechanism to manage higher risk activities, such as operators providing commercial hull cleaning services.
- Northland Regional Pest Management Plan controls are limited to identified organisms (for example, Regional Pest Management Plan or Ministry for Primary Industries unwanted organisms species list). Coastal plan controls can provide a precautionary approach where marine pests are suspected and for targeted protection of biodiversity values.
- The Biosecurity Act 1993 Pathways Plan rules can provide for exemptions, for example, where there is a threshold for level of hull fouling such as slime layer only, there could be exceptions for vessels with a RMA resource consent allowing higher fouling levels where risk is being managed, such as commercial craft operating out of low-risk harbours and only visiting low-risk destinations.

This document focuses on the management of risks associated with hull fouling (as the major threat). Marine pests can be introduced or spread by a number of activities and the following points outline the six main 'modes of infection':

- **Ballast water**: councils are unable to include rules in regional coastal plans to control the discharge of ballast water from vessels and therefore this falls beyond the scope of this document. Biosecurity Act provisions may control marine pest risks from ballast water and the Ministry for Primary Industries controls ballast water risks from the arrival of international vessels into New Zealand waters [(78)] Ballast Water - Import Health Standard.
- **Bilge water**: while the discharge of bilge could in theory be regulated under a coastal plan, the risks are generally of a nature more practically managed through Biosecurity Act provisions targeting specific high-risk areas and species.
- **Hull fouling (including niche areas):** biofouling risk can be mitigated through appropriate use and maintenance of anti-fouling coatings and removal of biofouling during vessel haul-out or when safe, by in-water cleaning. These activities could be managed under RMA coastal plan provisions and Biosecurity Act functions. These options are explored in more detail in the rest of this report. The Ministry for Primary Industries controls hull fouling risks from the arrival of international vessels into New Zealand waters [(79)] Craft Risk Management Standard - Biofouling on Vessels
- **Gear and equipment:** this includes diving and fishing gear, kayaks, ropes, chains, anchors and marine farming lines. Risks associated with gear and equipment are impractical to separately regulate within regional council RMA functions and can be managed under Biosecurity Act provisions and through promotion of non-regulatory good practice. The requirement for aquaculture operations to have a Biosecurity Management Plan (covering gear and equipment) is included in the Proposed National Environmental Standard for Marine Aquaculture [(80)] .
- **Livestock and bait:** the main risks associated with livestock and bait relate to aquaculture and the establishment and transfer of stock. The movement of aquaculture stock and equipment, may hasten or exacerbate the spread of harmful aquatic organisms if not appropriately managed. Marine farms can also provide ideal habitats for some diseases or biofouling species (for example, sea squirts) to establish. Aquaculture activities require resource consent. Marine pest risks both to and from the aquaculture industry are relevant matters when proposals are being considered and direction

76 *Cranfield H. J., Gordon D. P., Willan R. C., Marshall B. A., Battershill C. N., Francis M. P., Nelson W. A., Glasby C. J., and Read G. B., 1998. Adventive marine species in New Zealand. National Institute of Water and Atmospheric Research, Technical Report 34., Wellington, New Zealand.*

77 *Hewitt C., and Campbell M. (2008). Assessment of Relative Contribution of Vectors to the Introduction and Translocation of Marine Invasive Species. Final Report for Project 9/2007 prepared by the Australian Maritime College for the Department of Agriculture, Fisheries and Forestry, Canberra, Australia.*

78 *Import Health Standard Ballast Water from All Countries, 16 December 2015.*

79 *Craft Risk Management Standard (CRMS) – Biofouling on Vessels Arriving to New Zealand, 15 May 2014.*

80 *Ministry for the Environment web site*

on suitable consent conditions can be provided via policy. The requirement for aquaculture operations to have a Biosecurity Management Plan (covering stock movements and containment) is included in the Proposed National Environmental Standard for Marine Aquaculture [81].

- **Structures:** structures are also able to be regulated under draft coastal plan provisions and therefore structures can be controlled by conditions. Marine pest risk management can be considered when assessing applications for structures and (as with aquaculture) direction on suitable consent conditions can be provided via policy.

Hull fouling and in-water cleaning in more detail:

Hull Fouling

Marine pests attached to hulls and associated niche areas (such as sea chests, bow thrusters, propeller shafts), can be dispersed into the marine environment either accidentally, through spawning or being knocked off, or deliberately, when the hull is cleaned. Examples of the probable transfer from Auckland Harbour to Whangarei Harbour include the ascidian *Styela clava* on marina pontoons and fanworm *Sabella spallanzanii* and alga *Undaria pinnatifida* on fishing vessels[82].

Council vessel hull monitoring has used a method to measure the level of fouling as a means of indicating the level of risk on vessels in Northland. The method compared two visual assessments, one beneath and the other above the water. Results found that if macro-fouling was visible when viewed from above the water, that the level of fouling was likely to exceed LOF2. Otherwise, only the below water assessments were effective at accurately describing the extent of hull fouling. The method is based on a five-point scale ranging from low risk 'slime layer only' fouling (level of fouling – LOF1) to heavily fouled hulls (LOF5) as illustrated below[83]:

Outline of the vessel hull level of fouling (LOF) scale.

Scale	Description	Macro-fouling cover (%)
LOF1	Slime layer fouling only (with the exception of the ubiquitous goose barnacles). No macro-fouling.	NIL
LOF2	Light fouling (with the exception of barnacles).	1-5%
LOF3	Considerable fouling.	6-15%
LOF4	Extensive fouling.	16-40%
LOF5	Very heavy fouling	41-100%

This is a similar approach to the Craft Risk Management Standard for Vessel Biofouling [84] that sets hull fouling standards for vessels entering New Zealand territorial waters.

While the Craft Risk Management Standard has been only a voluntary standard since May 2014, compliance will be required from May 2018. The Craft Risk Management Standard limits fouling to slime layers and goose barnacles on all hull surfaces for all long stay vessels. There is provision for short stay vessels (less than 21 days) that are only visiting designated 'places of first arrival' to have a slightly greater level of fouling involving small isolated patches of specified organism types (similar to the LOF2 score).

81 *Ministry for the Environment web site*

82 *In-water cleaning of vessels, biosecurity and chemical contamination risks, Ministry for Primary Industries Technical Paper No. 2013/11.*

83 *A Risk-Based Predictive Tool to Prevent Accidental Introductions of Nonindigenous Marine Species. Oliver Floerl, Graeme J. Inglis, Barbara J. Hayden, National Centre for Aquatic Biodiversity and Biosecurity, National Institute of Water and Atmospheric Research, Christchurch.*

84 *http://www.biosecurity.govt.nz/regs/sea-craft-ports/sea-craft*

Biosecurity Act 1993 controls proposed in the Northland Regional Pest and Marine Pathway Management Plan 2017-2027 manages vessels arriving in Northland and the movement of vessels between designated 'places' (areas consisting of a single or combination of harbours and bays) with greater than LOF2 (light fouling). This approach is supported using benefit-cost model originally developed by Cawthron Research [85] but adapted for the Northland situation [86] and summarised in the table below:

	Management regime						
	Current	LOF-4	LOF-3	LOF-2 - with movement controls	LOF-2	LOF-1	LOF-0
Benefit ($M)	$9.2	$25.9	$64.3	**$70.0**	$67.2	$52.3	$41.2
Private costs ($M)	$0	$1.6	$8.4	**$9.0**	$17.3	$31.7	$57.6
Public costs ($M)	$3.3	$4.5	$4.7	**$4.9**	$6.1	$9.9	$11.4
Total Cost ($M)	$3.3	$6.1	$13.1	**$13.9**	$23.4	$41.6	$69.1
Net benefit ($M)	$5.9	$19.8	$51.2	**$56.1**	$43.8	$10.8	-$27.9
Benefit / Cost ratio	2.8	4.2	4.9	**5.0**	2.9	1.3	0.6

For the above biofouling controls to be effective a high level of compliance is required. Biosecurity Act 1993 enforcement tools lack the ability to issue infringement notices that provide considerable deterrence value for minor offenses and are available under the RMA.

In-water Cleaning

Based on discussions with boat owners, there is currently likely to be a high degree of unauthorised in-water cleaning as there is little council management over where, when and how it happens. However, much of this is likely to involve low risk: locations, slime layers and gentle non-abrasive methods.

Anti-foul coatings and other management practices (such as regular wipe-downs for hull slime layer removal) can prevent the development of hull fouling communities. In 1997, the Australian and New Zealand Environment and Conservation Council (ANZECC) published a 'Code of Practice for Antifouling and In-Water Hull Cleaning and Maintenance ' to provide guidance on the appropriate use of anti-fouling coatings and the best practice for in-water cleaning and maintenance of vessels. Most first generation regional coastal plans (including the operative Regional Coastal Plan for Northland) either prohibited or were very precautionary toward in-water hull cleaning due to the advice of the ANZECC Code of Practice.

Since then a number of significant changes have occurred within the maritime industry in relation to anti-fouling coatings and the management of biofouling on vessels. Tributyltin (TBT) based anti-fouling coatings have harmful effects on the marine environment, however, from January 2008, TBT based anti-fouling coatings were not to be present on any vessels.

Some modern paint types, such as fouling release coatings, do not contain active biocides, but require regular cleaning in-water to curtail biofouling accumulation. In-water cleaning of surfaces that lack biocides may not have the chemical pollution risks attributed to other types of coatings. There is now a growing acceptance that regular hull maintenance, including in-water hull cleaning to prevent the development of mature biofouling, may create a smaller biosecurity risk than no management of biofouling on vessels between dry-dockings.

85 *A benefit-cost model for regional marine pathway management*

86 *NRC pathway management benefit-cost analysis*

As a result of these changes, the 1997 ANZECC Code of Practice was replaced with the DAFF/NZ[87] Anti-fouling and In-water Cleaning Guidelines, June 2013. The international trend now, as indicated in the International Maritime Organization[88] Biofouling Guidelines and the DAFF/NZ Anti-fouling and In-water Cleaning Guidelines, is for in-water cleaning or other maintenance methods for hulls to be considered acceptable under certain circumstances and with the application of risk mitigating measures. Also, cleaning techniques that avoid damaging anti-fouling paint coating or impairing its function are encouraged.

This risk-based approach to management of hull fouling and in-water cleaning is generally supported by Ministry for Primary Industries, Department of Conservation and emerging regional biosecurity provisions, both under the Biosecurity Act 1993 and the RMA.

8.10.4 Management options

This section summarises the management options for marine pests. The intention is not to identify every different combination of approach as there would be many, but to represent the range of options and highlight key differences in approaches.

The current Regional Coastal Plan prohibits the intentional introduction and spread of marine pests. We think tight controls to prevent pests being introduced or spread is obvious good management. However, a prohibited activity status is overly onerous, as the definition of marine pest is quite broad and there may be situations where introducing or spreading a marine pest is appropriate. For example, there could be circumstances where a vessel with hull fouling that includes an identified marine pest species may successfully manage the risk of introduction by limiting it's movement to a port where that pest species already exists. Therefore, the assumption is that introducing or spreading marine pests will be a non-complying activity for all the management options, not a prohibited activity.

In-water hull cleaning where there is no discharge is a permitted activity in all the options. For example sample collection where a discrete sample of fouling is carefully removed for identification without discharge. Similarly removal of spot fouling below the 'light fouling' threshold is permitted where there is no discharge. However the preferred approach is that operators providing cleaning services manage risks associated with in-water hull cleaning via resource consent to allow for an appropriate assessment of the suitability of controls.

Above-tide hull cleaning where all the dislodged material and anti-foul coating is collected (for example, by using a tarpaulin) and there is no discharge is also permitted. However all the options include a discretionary activity of vessel hull anti-fouling maintenance on the foreshore to manage the risk of discharge to the coastal marine area. This is in response to council staff concerns with the proportion of current activities in the foreshore failing to capture contaminants and the likelihood that this activity will increase with greater biosecurity control on hull fouling.

While marine pests can be spread and introduced in a number of ways, the management options assessed for this plan provisions focus on in-water cleaning and whether or not to reinforce hull fouling controls under the Biosecurity Act 1993 proposed in the Northland Regional Pest and Marine Pathway Management Plan 2017-2027.

Key terms

Development zones - for the purpose of this report, this term represents the following zones in the coastal marine area - coastal commercial zone, mooring zone and marina zone.

BSA - Biosecurity Act 1993

The options below lay out a combination of different approaches that could be taken. In summary these are:

Controls on hull cleaning, by limiting in-water cleaning without containment to:

- Certain lower risk or already modified/sacrificial areas, for example, development zones/grids; and
- Where the fouling is low risk, either due to the low level of fouling or vessel movement history.

87 *Australian Government Department of Agriculture, Fisheries and Forestry and New Zealand.*

88 *The International Maritime Organization (IMO) is the United Nations specialised agency with responsibility for the safety and security of shipping and the prevention of marine pollution by ships.*

Note: any in-water cleaning activities also need to consider the discharge of anti-foul coatings that can contain hazardous substances. In-water cleaning slightly increases the risk of hazardous substance contamination. However, if limited to developed marine zones where the activity already occurs, regional council sediment monitoring would indicate contaminant levels are likely to be at acceptable levels [89] as compared to the Australian and New Zealand Guidelines for Fresh and Marine Water Quality/ANZECC 2000 Guidelines.

Northland Regional Council monitor sediment metal concentrations in sediments at a range of sites throughout the region and this includes a programme to sample 32 sites in the Whāngārei Harbour and Bay of Islands. This programme has taken samples in 2010, 2012 2014 and 2016 with the aim of assessing the contaminant status of the sediment, identify environmental issues and track changes in the quality of the sediment over time. Ongoing information from this programme can be used to evaluate whether any build up of contaminant levels is trending towards unacceptable levels. It is likely that additional monitoring sites will be necessary to ensure concentrations of contaminants (e.g. copper) remain acceptable.

The approaches outlined below exclude in-water cleaning of barges and vessels greater than 25m in length with ablative biocidal coating due mainly to the potential for larger quantities of anti-foul coatings and associated hazardous substances being discharged, but also the potential release of marine pests.

In-water cleaning of barges and large vessels requires resource consent under all the options. This is because:

- They have been associated with past marine pest incursions and heavily fouled hulls and are considered an elevated risk therefore these; and
- Due to their size, cleaning of barges and large vessels often already occurs out of water (albeit at less frequent intervals than smaller vessels.

The Auckland Council has referred to capture of debris to 50 micrometres in diameter when in-water cleaning hulls with macro-fouling as a standard for rules (as recommended in the DAFF/NZ[90] Anti-fouling and In-water Cleaning Guidelines, June 2013. This is not appropriate for Northland because of restricted access to the technology required to achieve this standard. It is also noted that capture to debris of 50 micrometres in diameter is guidance only and that there may be circumstances where other standards above or below this would be appropriate, for example, the spores of *Undaria pinnatifida* are 10 micrometres in diameter.

The Ministry for Primary Industries provides an exception for 'short-stay vessels' that are classed as under 'biosecurity surveillance' and visiting a place designated under section 37 of the Biosecurity Act 1993 as a 'Place of First Arrival' for less than 21 days and subject to the Craft Risk Management Standard. Management options allowing for vessels with a hull level of fouling score of LOF2 correspond closely with the 'short-stay vessel' standard, but apply it to all areas rather than limiting it to places designated under section 37 of the Biosecurity Act 1993 as a 'Place of First Arrival'.

Controls on good vessel hull management to prevent bio-fouling accumulation and release of bio-fouling:

The three in-water cleaning management options each include the option of whether to:

'A' - reinforce the Biosecurity Act 1993 bio-fouling controls proposed in the Northland Regional Pest and Marine Pathway Management Plan 2017-2027; or

'B' - not include bio-fouling controls.

The advantage of option 'A' is that achieving a reduced risk of marine pest introduction and spread requires a high level of compliance and this is more likely through use of both the RMA and Biosecurity Act 1993. In particular RMA infringement notices provide a more refined and effective deterrence regime for achieving improved hull fouling standards than relying on the primary Biosecurity Act 1993 tools (notice of direction or prosecution).

It was considered impractical and overlay complex to suggest a different fouling management regime than proposed in the Northland Regional Pest and Marine Pathway Management Plan 2017-2027.

89 *In-water cleaning of vessels: Biosecurity and chemical contamination risks. Ministry for Primary Industries Technical Paper No: 2013/11, Donald Morrisey, Jennifer Gadd, Mike Page, Oliver Floerl and Chris Woods (NIWA), John Lewis (ES Link Services Pty Ltd), Andrew Bell (Ministry for Primary Industries), Eugene Georgiades (Ministry for Primary Industries).*

90 *Australian Government Department of Agriculture, Fisheries and Forestry and New Zealand.*

Option 1: minimalist approach (status quo)

Overview: this approach provides no permitted in-water hull cleaning making this a discretionary activity in all zones and includes the options A and B i.e. whether or not to include hull fouling controls or rely on proposed Biosecurity Act 1993 provisions.

Background: this approach rolls over existing coastal plan provisions that do not permit discharge of fouling or anti-foul coating from in-water cleaning in any locations and therefore encourages vessel haul-out for cleaning.

Under this regime development zones (ports, wharves and mooring management areas) already have detectable contaminant levels associated with anti-foul coatings and also have higher marine pest occurrence.

The option 'B' approach with no RMA hull fouling rules would also reflect status quo and avoids duplication with the proposed in the Northland Regional Pest and Marine Pathway Management Plan 2017-2027 but does not have the deterrence associated with infringement notices and other RMA tools.

The option 'A' approach provides for the integration of marine pest management between the RMA and Biosecurity Act 1993 (belt and braces) and allows the different options available under both legal frameworks, in particular the deterrence associated with infringement notices is likely to increase the level of compliance and therefore reduce the likelihood of marine pest introduction and spread in the region.

Hull fouling controls Option A or B		In water cleaning – development zones	In water cleaning – outside development zones	Key policy approach
Option A Both RMA and BSA	Option B BSA only	Discretionary.	Discretionary.	None.
BSA = Biosecurity Act 1993 controls proposed in the Northland Regional Pest and Marine Pathway Management Plan 2017-2027				

Option 2: permissive approach

Overview: this option provides permitted discharge of anti-foul coating from in-water hull cleaning of lightly fouled vessels in all but Significant Ecological Areas. It provides clear encouragement to manage hull fouling before it develops beyond light fouling and represents the cheapest option for vessel owners. This recognises anecdotal evidence that in-water cleaning is a common existing practice, however is not preferred as it permits discharge and adverse effects in unmodified areas, and the level of compliance and ability to monitor is likely to be significantly reduced, due to the extent and complexity of the SEA mapping.

As with option 1 above, this option includes the additional A and B options of reinforcing hull fouling controls under the Biosecurity Act, or not.

*Background:*this approach:

- *Allows us to promote good hull hygiene practice in conjunction with regulating hazardous substance discharge associated with release of anti-foul coating during cleaning.*
- *Does not provide protection to areas that are not mapped as having significant ecological values and therefore represents greater risk of adverse effects than options 1 or 3.*

Hull fouling controls Option A or B		In water cleaning – development zones and other non SEA areas	In water cleaning – in SEA areas	Key policy approach
Option A Both RMA and BSA	Option B BSA only	Permitted.	Discretionary.	Permitting medium risk in-water cleaning.
BSA = Biosecurity Act 1993 controls proposed in the Northland Regional Pest and Marine Pathway Management Plan 2017-2027				

Option 3: moderate approach

Overview: this option provides permitted discharge of anti-foul coating from in-water hull cleaning of lightly fouled vessels in development zones. It provides clear encouragement to manage hull fouling before it develops beyond light fouling. This also recognises anecdotal evidence that in-water cleaning is a common existing practice, while confining the activity to areas that represent a modified environment and where monitoring can be focused.

As with option 1 above, this option includes the additional A and B options of reinforcing hull fouling controls under the Biosecurity Act or not.

*Background:*this approach:

- *Allows us to promote good hull hygiene practice in conjunction with regulating hazardous substance discharge associated with release of anti-foul coating during cleaning.*
- *Provides additional protection to our higher value areas (all areas outside development zones).*

Hull fouling controls Option A or B		In water cleaning – development zones	In water cleaning – outside development zones	Key policy approach
Option A Both RMA and BSA	Option B BSA only	Permitted.	Discretionary.	Permitting low risk in-water cleaning.
BSA = Biosecurity Act 1993 controls proposed in the Northland Regional Pest and Marine Pathway Management Plan 2017-2027				

8.10.5 High level objectives and measures

Section 32 requires an assessment of "*…the efficiency and effectiveness of the provisions in achieving the objectives…*". Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section Evaluation approach for more details.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. They signal a direction for where we want to head, without stating how far we go – that comes later (they are the beginnings of objectives).

Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against.

High level objective	Measure
Minimise the introduction and spread of marine pests in the region.	*Scale of risk:* *1 = moderately more risk.* *2 = Slightly more risk.* *3 = Same as current risk.* *4 = Slightly less risk.* *5 = Moderately less risk.*
Minimise environmental impact from anti-fouling discharges.	*Scale of harm compared with current:* *1 = moderate increase.* *2 = Slight increase.* *3 = Same as current.* *4 = Slight decrease.* *5 = Moderate decrease.*
Deterrence from ability to use RMA infringement notices for non compliance with both in-water cleaning and hull fouling.	*Yes or No*
Minimise compliance costs to vessel owners	*Scale of cost:* *High* *Medium* *Low*

Explanation for the high level objectives and measures

Minimise the introduction and spread of marine pests in the region.

When it comes to the adverse effects caused by pests, what is clear is that prevention is considerably better than cure, and this is especially the case with marine pests given that they can remain unseen during the only period where eradication is achievable. Mediterranean fan worm has become established in Northland in the past five years; this may have been avoided had there been effective controls on hull fouling. Under the current Regional Coastal Plan provisions, there is approximately a 75% likelihood of marine pest introduction in any one year [(91)]. Data suggest that approximately 70% of New Zealand marine pest introductions are from hull fouling [(92)(93)]. The rate of new marine pest arrivals as a result of hull fouling is approximately 50%, that is, one in two years.

91 *Based on Ministry for Primary Industries 'marine high risk site' surveillance data from 2010 to 2015.*

92 *Cranfield H. J., Gordon D. P., Willan R. C., Marshall B. A., Battershill C. N., Francis M. P., Nelson W. A., Glasby C. J., and Read G. B., 1998. Adventive marine species in New Zealand. National Institute of Water and Atmospheric Research, Technical Report 34., Wellington, New Zealand.*

93 *Hewitt C., and Campbell M., 2008. Assessment of Relative Contribution of Vectors to the Introduction and Translocation of Marine Invasive Species. Final Report for Project 9/2007, prepared by the Australian Maritime College for the Department of Agriculture, Fisheries and Forestry, Canberra, Australia.*

The factors driving the rate that new pest species become established in New Zealand have not changed significantly in the past few years. However, controls are proposed under the Biosecurity Act 1993 in the proposed Northland Regional Pest and Marine Pathway Management Plan 2017-2027. These controls introduce rules limiting vessels to 'light fouling' if they are arriving in the region or moving between the main harbours and estuaries.

For the purpose of introducing a measure for this objective, it has been assumed that the proposed Biosecurity Act 1993 controls are in force. The measure then compares the level of risk to this 'current' scenario with increased or reduced risk associated with the option being assessed.

Increased regulation should decrease the risk of introduction or spread of marine pests provided there is a high degree of uptake (compliance). It is assumed that sufficient resources are available for effective education, monitoring and enforcement associated with these rules in order to achieve a very high level of uptake by vessel owners. This objective is measured by the likelihood of controls being effective at reducing risk.

Minimise the environmental impact from anti-fouling discharges.

The three in-water cleaning management options vary in effectiveness at managing the discharge of anti-fouling compared with the current situation. This measure is largely unaffected by the separate options A and B given that they both raise the bar on hull fouling to the same extent, i.e. both are likely to increase the frequency of hull cleaning.

This measure is a staff judgement that simply gauges the increased level of in-water cleaning and environmental impact. This takes into account that development zones (outside SEA areas) represent a modified environment less prone to further environmental impact than unmodified areas.

The following five-point scale is used:

Scale of harm compared with current:

1 = moderate increase.

2 = Slight increase.

3 = Same as current.

4 = Slight decrease.

5 = Moderate decrease.

Deterrence from ability to use RMA infringement notices for non compliance with both in-water cleaning and hull fouling.

The Biosecurity Act provides the primary mechanism for controlling marine pests through the proposed Northland Regional Pest and Marine Pathway Management Plan 2017-2027. Biosecurity Act enforcement tools are coarse with 'notices of direction' simply requiring remedial action to be undertaken and 'prosecution' involving significant legal costs for all parties. By supporting the Biosecurity Act provisions with RMA rules in this plan, 'infringement notices' are available to provide additional deterrence and greater likelihood of compliance. For vessel hull biofouling controls to be effective, a high level of compliance is necessary, as a single vessel can be responsible for the introduction or spread of marine pests. Therefore this high level objective purely confirms whether or not the management option includes the infringement notice tool.

Minimise compliance costs to vessel owners.

This objective measures the costs of in-water hull cleaning compared with haul out. This measure is a staff judgement that simply gauges the increased level of costs (low, medium and high) between the three main options. The ability to in-water clean a vessel hull in most areas (Management Option 2) reduces haul-out frequency and travel time to development zones (Management Option 3) or haul out facilities (Management Option 1). For example the cost to haul-out a 5-10m vessel is approximately $670 compared to $160 that is the estimated cost to handwash the same vessel. A more detailed break down of costs and benefits for different biofouling and vessel cleaning scenarios is provided with the benefit-cost assessments undertaken for the hull fouling controls in the proposed Northland Regional Pest and Marine Pathway Management Plan 2017-2027.

High level objectives not included

Section 32 requires an assessment of the impacts on economic growth and employment opportunities (s32(2)(a)). We are developing a tool to better measure costs and benefits associated with different management regimes. However, currently the impact of the management options on economic growth and employment opportunities can't be determined with confidence. Therefore, economic growth and employment opportunities have not been included as high level objectives. For more information go to the section 1.7 'Assessing impacts on economic growth and employment opportunities'.

8.10.6 Evaluating the management options

High level objective	Option 1 No in-water cleaning		Option 2 In-water cleaning in all but high value areas		Option 3 In-water cleaning just development zones	
	A RMA hull fouling controls	B Rely on BSA*	A RMA hull fouling controls	B Rely on BSA *	A RMA hull fouling controls	B Rely on BSA*
Minimise the introduction and spread of marine pests in the region. *Measure* Scale of risk: 1 = moderately more risk. 2 = Slightly more risk. 3 = Same as current risk. 4 = Slightly less risk. 5 = Moderately less risk.	4	3	2	2	5	4
Minimise environmental impact from anti-fouling discharges. Measure Scale of harm compared with current: 1 = moderate increase. 2 = Slight increase. 3 = Same as current. 4 = Slight decrease. 5 = Moderate decrease.	3	3	1	1	2	2

High level objective	Option 1 No in-water cleaning		Option 2 In-water cleaning in all but high value areas		Option 3 In-water cleaning just development zones	
	A RMA hull fouling controls	B Rely on BSA*	A RMA hull fouling controls	B Rely on BSA *	A RMA hull fouling controls	B Rely on BSA*
Deterrence from ability to use RMA infringement notices for non compliance with both in-water cleaning and hull fouling. *Measure = Yes or No*	Yes	No	Yes	No	Yes	No
Minimise compliance costs to vessel owners *Measure* High Medium Low	High	High	Low	Low	Medium	Medium
BSA = Biosecurity Act 1993 controls proposed in the Northland Regional Pest and Marine Pathway Management Plan 2017-2027						

Certainty about the evaluation

There is uncertainty with predicting figures to represent likely marine pest introduction or further spread of existing pests, however, for the purpose of comparing different management approaches, this is a useful tool that highlights the differences between the options. This assessment has been refined following draft plan and Pathways Plan feedback.

Time-frame

The evaluation is made over the life-time of the plan (10-15 years).

The preferred management option

The preferred management option is Option 3A: that allows in-water cleaning but restricts it to development zones and includes the added deterrence associated with ability to issue environmental infringement notices for a hull fouling rule breach.

Option 3 provides a cost incentive for vessel owners to maintain clean hulls, as haul out costs are reduced by allowing in-water cleaning. The cost to vessel owners of restricting in-water cleaning to development zones is slightly greater than allowing in-water cleaning anywhere. This increased cost is balanced out through avoiding discharge effects in identified significant ecological values and recognising that development zones represent an existing modified environment.

The option 'A' approach provides for the integration of marine pest management between the RMA and Biosecurity Act 1993 (belt and braces) and allows the different options available under both legal frameworks, in particular the deterrence associated with infringement notices is likely to increase the level of compliance and therefore reduce the likelihood of marine pest introduction and spread in the region.

The options with the approach 'B' with no hull fouling rules avoids duplication [(94)] but do not have the deterrence associated with RMA infringement notices.

On the face of it Option 1 (status quo) avoids discharges through not allowing in-water cleaning, however due to high haul out costs, there is likely to be a poor level of compliance (as currently) with hull cleaning occurring in uncontrolled locations and threatening high value areas, therefore this is not the preferred option.

Option 2 permits in-water cleaning everywhere outside significant ecological areas (SEA's) and represents the cheapest option for vessel owners. This approach is not preferred as it permits discharge and there is greater risk of adverse effects in unmodified areas, and the level of compliance and ability to monitor is likely to be significantly reduced, due to the extent and complexity of the SEA mapping. Therefore the key reason that this is not the prefferred option is that it increases the likelihood of adverse effects from anti-fouling discharge and increases the risk of marine pests introduction and spread.

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94 *with the proposed in the Northland Regional Pest and Marine Pathway Management Plan 2017-2027*

8.11 Mangroves

8.11.1 Executive summary

Mangroves can have both positive and negative effects on the aspects of the coastal environment valued by communities. Communities are often polarised in their views about mangroves and the extent to which they should (or should not) be removed or managed. This reflects the debate between public use and enjoyment of the coastal marine area and the ecological value of mangroves and their role in the wider marine ecosystem.

Land-use changes, deforestation, and structural modifications in the estuarine environment (for example, causeways) have caused significant changes in sediment dynamics and input in some estuaries, leading to increased mangrove growth and spread. Mangrove expansion is generally a symptom of these wider issues.

The removal of vegetation in the CMA is generally permitted under the RMA unless restricted in a regional plan. However disturbance of the CMA bed is restricted unless permitted in a regional plan.

The Regional Coastal Plan underwent a plan change (operative 2008) to relax the rules for pruning and removing mangroves in specific circumstances. Mangrove removal is currently only permitted (that is, no resource consent required) for keeping artificial land drainage channels clear. The only mangrove removal as a controlled activity is for maintaining sight lines on roads; otherwise all other mangrove removal is a restricted discretionary or non-complying activity.

The review of the current Regional Coastal Plan[(95)] concluded that:

- The community wants the ability to participate in the resource consent process for proposals for large-scale removal.
- Rules for smaller-scale mangrove removal may be more relaxed (for example, permitted or requiring no public notification).

Feedback from the Draft Regional Plan was generally supportive of provisions allowing small-scale mangrove removal to maintain activities with established use. Remaining provisions attracted a high level of interest that tended to either advocate for the attributes of mangroves or their removal.

Three management options were evaluated. The three options were to roll over the current Regional Coastal Plan provisions (Option A) and two options that reflect the approach taken in the Auckland Unitary Plan and proposed Bay of Plenty Coastal Environment Plan – one which was much the same (Option B) and the other a simplified version (Option C). Option C was assessed as the preferred option.

Seedling removal	Removal to maintain use or operation of structures	Removal for access to public land or to maintain existing navigation channels	All large-scale mangrove removal including in significant marine areas	Key policy approach
Permitted.	Permitted.	Controlled.	Discretionary.	• Set out circumstances when mangrove removal is not appropriate. • Set out criteria for mangrove removal.

95 www.nrc.govt.nz/contentassets/0d3e217aec2346549fdbd0b3e579c501/regional-plan-review-summary---marine-biodiversity.pdf

8.11.2 Relevant provisions

This evaluation supports the following Regional Plan provisions:

- Rules C.1.4 - Mangrove removal
- Rules C.1.8 - Coastal Marine Area General Conditions (Mangrove removal and Dredging, disturbance and diversion)
- Policy D.2.7 - Managing adverse effects on indigenous biodiversity
- Policy D.5.20 - Dredging, disturbance and deposition - effects on areas with significant values
- Policy D.5.22 - Mangrove removal – purpose
- Policy D.5.23 - Mangrove removal – outcome
- Policy D.5.24 - Mangrove removal – adverse effects

8.11.3 The problem, opportunity and/or requirement

There has been a long-term trend of increase in extent of mangroves in the upper North Island and evidence suggests this is linked to increased rates of sedimentation in estuaries and harbours[96].

Extensive forests of large mangrove trees exist only in Northland's harbours and estuaries and in the Hauraki Gulf. Northland has 13 harbours and major estuaries, which contain more than 100 hectares each of mangroves, and five of the larger harbours contain more than 1000 hectares each (Kaipara, Hokianga, Rangaunu, the Bay of Islands and Whangārei)[97]. South of the Kaipara Harbour on the west coast and the Hauraki Gulf on the east, mangroves progressively dwindle in size and abundance.

While geographically confined to temperate northern harbours and estuaries, mangroves are neither a rare nor a threatened species in Northland or New Zealand. Mangroves can however provide an important contribution to natural character and ecological values including habitat for threatened species such as banded rail.

Land-use changes, deforestation, and structural modifications in the estuarine environment have caused significant changes in sediment dynamics and input in some estuaries. This has resulted in elevated intertidal areas and subsequent increases in the amount of habitat suitable for mangroves. Nutrient run-off from the land is also likely to increase mangrove growth although it is unclear whether it plays a part in their spread. Consequently mangrove expansion is generally a symptom of wider issues in the catchment.

Evidence of historical and future mangrove expansion includes:

- Mangrove-habitat expansion in North Island estuaries has ranged from 0.2–20 % yr^{-1}[98].
- The average mangrove-habitat expansion in the Bay of Islands is 0.3–1.4% yr^{-1} [99].
- The average mangrove-habitat expansion in the Kaipara Harbour is 0.2–2.1% yr^{-1}[100].
- This general trend of expansion is likely to be similar within other Northland estuaries and harbours. This is substantially less than the average North Island rate, since the 1940s, of 4% yr^{-1}[101].
- Maintenance of existing mangrove habitat over the next century (based on Bay of Islands data) is likely to occur if the rate of sea level rise continues at the historical rate, since 1950, of 1.6 mm yr^{-1} however predicted accelerated sea level rise over the next century has the potential to result in large-scale loss of mangrove habitat [102].

96 *Morrisey D., et al. (2007). The New Zealand Mangrove: Review of the Current State Of Knowledge. Auckland Regional Council Technical Publication Number 325.*

97 *www.nrc.govt.nz/for-schools/school-information-packs/mangroves/*

98 *Morrisey D., Swales A., et al., 2010. The ecology and management of temperate mangroves.*

99 *Swales A., Gibbs M., et al., May 2012. Sediment sources and accumulation rates in the Bay of Islands and implications for macro-benthic fauna, mangrove and saltmarsh habitats.*

100 *Swales A., Gibbs M., et al., November 2011. Patterns and rates of recent sedimentation and intertidal vegetation changes in the Kaipara Harbour.*

101 *Morrisey D., Swales A., et al., 2010. The ecology and management of temperate mangroves*

102 *Swales A., Gibbs M., et al., May 2012. Sediment sources and accumulation rates in the Bay of Islands and implications for macro-benthic fauna, mangrove and saltmarsh habitats.*

Mangroves are an important part of the estuary ecosystem and can have both positive and negative effects on aspects of the coastal environment valued by communities. Known benefits mangroves can provide include:

- Habitat for various marine and terrestrial animals, including eels, grey mullet, snapper, kahawai, flounder and parore [(103)].
- mangrove forests are highly productive, an important source of organic material to nearby habitats and provide a disproportionately high level of carbon sequestration per hectare.
- Natural character and amenity values.
- Erosion control and shoreline protection from natural hazards.
- Reducing the release of urban stormwater contaminants that bind to sediments, like zinc and copper, by trapping and retaining the contaminated sediment.

However, the spread of mangroves can have adverse effects, including:

- Colonising the habitat of other indigenous coastal flora and fauna (for example, seagrass beds, saltmarsh, bird roosting and feeding sites, shellfish beds and mudflats).
- Accelerating estuary infilling.
- Restricting usability of coastal structures.
- Limiting public access by foot, vehicle or vessel.
- Decreasing amenity values and space for recreational activity.
- Blocking stormwater outlets and water courses.
- Damaging power lines.
- Limiting road safety sight lines.

Communities in Northland and other regions are often polarised in their views about mangroves and the extent to which they should (or should not) be removed or managed. The Auckland Unitary Plan received more submissions on mangrove removal than on any other coastal topic. This reflects the huge range of community views about the above positive and negative effects associated with mangroves.

There are those that see mangroves as essentially a nuisance plant that detracts from amenity values, blocks public access to and along the coastal marine area and colonises previously sandy beaches, and therefore individuals/groups should be able to freely remove it. Such positions are bolstered by the perceived adverse ecological effects associated with mangrove expansion such as reduction in saltmarsh, intertidal seagrass, mudflats and impact on species that rely on these habitats.

Conversely, there are those that prefer mangrove amenity values over mudflats and saltmarsh. Such positions are supported by mangrove ecological functions and the impact that mangrove removal would have on species that rely on them.

An example of a situation where these opposing views have played out in Northland is in Mangawhai Harbour where the Mangawhai Harbour Restoration Society Incorporated sought removal of approximately 42 hectares (revised down from 87) of mangroves and dredging to improve flushing and reduce the likelihood of a return to mangrove habitat. In addition to planning and landscape professionals, expert evidence was heard from 12 ecological experts, a sedimentologist and coastal engineer. The main issues that were in contention in this case are a common theme with large-scale mangrove removal proposals:

1) Conflicting views about the ecological significance of mangroves and the likely changes in habitat values as a result of mangrove habitat expansion with a reduction in saltmarsh and mudflats, verses reducing the extent of mangrove habitat and therefore increasing saltmarsh and mudflat habitat, and in some areas a potential return to sandy conditions. In both scenarios this involved potential beneficial and negative effects on species with high ecological values and opposing ecological evidence.
2) Uncertainty over the proposal's ability in some areas to achieve an outcome of a return to sandy conditions.
3) Effects of re-mobilising sediment, water clarity and turbidity.
4) Effects of whole tree removal (including root excavation and greater disturbance) verses cutting at or near the sea bed, use of machinery and timing of any on-going control of seedlings.

103 Crisp P, Daniel L., Tortell P, 1990. Mangroves in New Zealand – trees in the tide. GP Books, Wellington, 6 p.

While individual proposals are likely to attract polarised views, experience in New Zealand continues to provide tools and references to help assess the relative merit of different proposals, for example:

1) Regional mapping and supporting data identifies known Outstanding Natural Character and Significant Ecological Area values.
2) Criteria to assist in determining ecological significance of mangroves [(104)]:
   a) Duration of occupation;
   b) Formal protection status;
   c) Recognised ecological values;
   d) Present in a vegetation sequence;
   e) Beneficial or necessary to sustain threatened species;
   f) Invasion or spread within vegetation mosaic;
   g) Compromise to bird habitat such as high tide roosts;
   h) Use by fish and other species;
   i) Barrier to erosion and protection against climate change;
   j) Buffer to more sensitive ecological areas from activities of people, animals or other threats; and
   k) Likelihood of silt re-mobilisation.
3) The likelihood of a return to sandy conditions, [(105)]including a summary suggesting '*... that change to a sandier non-mangrove state will require at least a decade, if not far longer, for erosion of muddy sediment and dispersal or decomposition of remaining mangrove vegetative biomass. In sheltered locations, change to a sandier state appears unlikely.*'

8.11.4 Management options

This section summarises the management options for mangrove removal. The intention is not to identify every different combination of approach as there would be many, but to represent the range of options and highlight key differences in approaches.

The management options are described by the rule classification for the various categories of mangrove removal and their key policy approaches. Note, the options do not include an 'all other mangrove removal' category, on the assumption that it will be discretionary in all cases.

Controls likely to apply to all three of the following approaches are based on adverse effects of removal activities and include:

- Remedying visual disturbance within 48 hours in mapped high value areas and seven days elsewhere.
- Avoiding disturbance of seagrass, saltmarsh and other wetland areas.
- Notifying council prior to works in Significant Bird Areas or where they involve an area greater than 500m^2 in any one year.

In regards to permitted mangrove seedling removal, while this applies throughout the region, controls include:

- Undertaking works by hand; and
- Not involving tracked or wheeled motorised machinery.
- Seedling removal is excluded from:
  - significant bird areas during sensitive periods (August to March inclusive), and
  - existing mangroves (i.e. among pneumatophores of mangroves)

104 *Criteria drawn from a task force report for the Waikato Regional Council and Dr Coffey evidence 'Mangawhai Harbour Restoration Society Inc', ENV-2011-AKL-000110.*

105 *Lundquist C. J., Hailes S. F., Carter K. R., and Burgess T. C., 2014. Ecological status of mangrove removal sites in the Auckland region. Prepared by the National Institute of Water and Atmospheric Research for Auckland Council. Auckland Council Technical Report 2014/033.*

Option A: conservative approach (modified status quo)

Overview: on the spectrum of approaches, this is near the conservative and more precautionary end of the scale.

*Background:*this is the approach in the operative Regional Coastal Plan.

Seedling removal	Removal to maintain use or operation of structures	Removal to maintain navigation, land drainage and access to public land	Mangrove removal in significant marine areas and areas of Outstanding Natural Character	Key policy approach
Discretionary.	Restricted discretionary (with the exception of removal for maintaining road sight lines = controlled).	Restricted discretionary.	Non-complying.	Recognise value of mangroves. Recognise that there may be situations where mangrove removal is warranted.

Option B: Auckland and Bay of Plenty complex approach

Overview: these apply a relatively permissive approach to mangrove removal.

*Background:*these regions recognise beneficial and adverse effects associated with removal of mangroves. Provisions involve a high level of management and complexity. This includes council identifying specific sites where mangrove removal could be beneficial and a range of limiting conditions.

Seedling removal	Removal to maintain use or operation of structures	Removal to maintain navigation, land drainage and access to public land	Mangrove removal in significant marine areas and areas of Outstanding Natural Character	Key policy approach
Permitted (outside listed significant areas).	Permitted within a defined perimeter.	Permitted in specific areas, controlled under an area threshold, otherwise discretionary.	Discretionary – in areas where significant mangrove values are identified. Permitted – in identified wading bird habitat.	Set out circumstances when mangrove removal is not appropriate. Set out criteria for mangrove removal.

Option C: Simplified Auckland and Bay of Plenty approach

Overview: an approach at the more relaxed end of the regulatory spectrum. It is permissive for seedling removal and small-scale mangrove removal associated with authorised activities.

*Background:*this approach is similar to the approaches proposed in Auckland and the Bay of Plenty without much of the complexity.

While this approach is simplified and relatively permissive, it is envisaged that suggested controls will have a significant moderation on the scale of works and avoid adverse effects on significant matters.

Seedling removal	Removal to maintain use or operation of structures	Removal for access to public land or to maintain existing navigation channels	All large-scale mangrove removal including in Significant Marine Areas	Key policy approach
Permitted.	Permitted.	Controlled.	Discretionary.	Set out circumstances when mangrove removal is not appropriate. Set out criteria for mangrove removal.

8.11.5 High level objectives and measures

Section 32 requires an assessment of "*...the efficiency and effectiveness of the provisions in achieving the objectives...*". Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section 1.6 'Evaluation approach' for more details.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. They also signal a direction for where we want to head, without stating how far we go – that comes later (they are the beginnings of objectives).

Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against.

High level objective	Measure
Minimise adverse effects on the environment and coastal resource users.	Constructed scale: 1) Minor control (likely that adverse effects could occur) 2) Moderate control (medium likelihood that adverse effects could occur) 3) Significant control (unlikely that adverse effects could occur) 4) Full control (adverse effects very unlikely to occur)
Maximise public participation in decision-making.	Constructed measure based on level of public participation: 1 = no public participation. 2 = public can only make submissions on limited circumstances. 3 = public can make submission on large scale mangrove removal, but not small-scale. 4 = public can makes submission on all but the most minor mangrove removal. 5 = public can make submissions on all proposals for mangrove removal.
Minimise costs to mangrove removal proponents.	Costs of RMA approval for mangrove removal:

High level objective	Measure
	• Permitted activity = not applibable ($0). • Controlled (typically non-notified) = $839 (consent deposit initial fee). • Small scale discretionary mangrove removal = $839 (consent deposit/initial fee). • Large scale mangrove removal discretionary or non-complying (typically limited or fully notified) = $10,000-20,000 (consent deposit initial fee $3144 + staff estimation of additional costs based on recent large scale removal projects). • Prohibited = not applicable ($0).
Minimise additional mapping costs to council *Measure:* The cost of research to support identifying areas appropriate and not, for mangrove removal.	Estimation of the cost of research to support identifying areas appropriate and/or not a appropriate for mangrove removal. $250k – selection of harbours (not entire region).

Explanation for the high level objectives and measures

Minimise adverse effects on the environment and coastal resource users.

This measure is a staff judgement that simply gauges the degree of control over mangrove removal and potential for adverse effects for each option. The degree of control can range from 'full control' with a score of four to a score of one where there is least control and adverse effects are likely to be greatest. There are a range of values that can be adversely effected by mangrove removal operations. We have used a constructed measure to assess whether the management options are likely to practicably control (avoid or mitigate) adverse effects in terms of impacts on ecological, natural character other values and other users of the coastal environment. A constructed measure has been used because it is very difficult to quantify the actual and potential adverse effects of any particular management option.

Maximise public participation in decision-making.

The public is often polarised on mangrove removal issues, particularly regarding larger-scale removal. This measure is a staff judgement and highlights the potential for public involvements for each option through the notified and limited notified resource consent process.

Minimise costs to mangrove removal proponents.

This measure allocates the current cost for lodging a controlled or discretionary consent application (initial deposit fee) for small scale mangrove removal. For large-scale mangrove removal,the initial deposit fee for lodging a notified resource consent application was used in addition to an estimate of the application preparation costs. The later costs were estimated from recent records of large scale mangrove removal proposals in Northland.

The costs to mangrove removal proponents are connected to the first objective of minimising environmental effects. Typically where adverse effects are minimised there is increased regulation and cost.

Minimise additional mapping costs to council.

One option being considered includes identifying locations where mangrove removal is appropriate and where it is not appropriate. There are considerable costs associated with this process and while they are not known staff have given an estimation based on experience with other mapping projects and discussions with other councils. The estimate assumes that on site assessment would be necessary and that only a proportion of Northland harbours are included. The estimate does not include the cost of public participation in the process.

High level objectives not included

Section 32 requires an assessment of the impacts on economic growth and employment opportunities (s32(2)(a)). However, the impact of the management options on economic growth and employment opportunities is imperceivable and/or can't be determined with any confidence. Therefore, economic growth and employment opportunities have not been included as high level objectives. For more information go to the section '1.7 'Assessing impacts on economic growth and employment opportunities''.

8.11.6 Evaluating the management options

High level objective and measure	Removal category	Option A	Option B	Option C
Minimise adverse effects on the environment and coastal resource users. *Measure:* Constructed scale of risk of adverse effects: 1) Minor control (likely that adverse effects could occur). 2) Moderate control (medium likelihood that adverse effects could occur). 3) Significant control (unlikely that adverse effects could occur). 4) Full control (adverse effects very unlikely to occur).	Seedling.	3	2	2
	Use or operation of structures.	2	1	1
	Navigation, land drainage and access to public land.	3	2	2
	All other mangrove removal including within significant marine areas.	4	3	3
Maximise public participation in decision-making. *Measure:* Constructed measure based on level of public participation: 1 = no public participation. 2 = public can only make submissions on limited circumstances. 3 = public can make submission on large scale mangrove removal, but not small-scale. 4 = Public can makes submission on all but the most minor mangrove removal 5 = public can make submissions on all proposal for mangrove removal.	Seedling.	4	2	1
	Use or operation of structures.	4	3	2
	Navigation, land drainage and access to public land.	4	3	3
	All other mangrove removal including within significant marine areas.	5	3	4

High level objective and measure	Removal category	Option A	Option B	Option C
Minimise costs to mangrove removal proponents. *Measure:* Costs of RMA approval for mangrove removal: • Permitted activity = not applicable ($0). • Controlled (typically non-notified) = $839 (consent deposit initial fee). • Small scale discretionary mangrove removal = $839 (consent deposit/initial fee). • Large-scale mangrove removal discretionary or non-complying (typically limited or fully notified) = $10,000-20,000 (consent deposit initial fee $3144 + staff estimation of additional costs based on recent large scale removal projects). • Prohibited = not applicable ($0).	Seedling.	$839-10,000	$0-839	$0
	Use or operation of structures.	$839-10,000	$0-839	$0
	Navigation, land drainage and access to public land.	$10,000	$0-839	$0-839
	All other mangrove removal including within significant marine areas.	$10,000	$10,000	$10,000
Minimise costs to council. *Measure* The cost of research to support identifying areas appropriate and/or not a appropriate for mangrove removal.	All other mangrove removal including within significant marine areas.	$0	$250k - selection of Northland harbours	$0

Certainty about the evaluation

There is always uncertainty about the potential impacts of management options. We're most confident about the accuracy of the public participation and mangrove removal cost measures. This is particularly the case for Option C, due to it's simplicity.

We are also confident in the measurement of adverse environmental effects associated with the use or operation of structures or activities in significant areas. There is however some uncertainly with regards to adverse effects from activities involving navigation, land drainage and access to public land due to the range of potential effects from these activities. There is also uncertainty over the cost of mapping mangrove extent and values in Northland. We're least confident with regards to seedling removal, as the level of interest in undertaking this activity is not known.

We're confident that evaluation is accurate enough to make a decision on the preferred option. We don't think it would be viable and/or worthwhile to get more information to increase the accuracy of our evaluation as it's unlikely to change the relative differences between the options.

Time-frame of the evaluation

The evaluation is made over the life-time of the plan (10-15 years).

The preferred management option

The preferred management option for the Regional Plan is Option C: simplified Auckland and Bay of Plenty approach.

In regards to the level of council control and minimising adverse environmental effects, Option A (modified status quo) scored best with an average of three. The other two options scored the same and had an average of two, reflecting the increased level of recognition these option give to lower risk activities.

With regards to the objective of maximising public participation in decision-making, Option A (modified status quo) scored the highest due to the conservative approach it takes to almost all mangrove removal. Option B (Auckland and Bay of Plenty approach) involves greater ability for public involvement in mangrove removal associated with authorised activities (for example, structures), whereas the preferred approach (Option C) takes a position that it is largely unnecessary to involve public where mangroves are adjacent to and affecting authorised activities.

Of the three, Option C scores the best results for minimising costs of mangrove removal. It achieves this through:

- Removing costs associated with small-scale mangrove removal for the purpose of maintaining authorised activities.
- Recognising that large-scale mature mangrove removal attracts polarised views and is best left to a wide reaching discretionary process (whether in a highly valued area or not).
- Permitting seedling removal by hand, providing a cost-effective option to those wishing to control mangrove spread into new areas.
- Allowing for a range of circumstances including within areas identified with Outstanding Natural Character and Significant Ecological Value. This broadly applies a discretionary activity however is backed up with strong policy direction to provide for planning decisions that protect significant ecological and Outstanding Natural Character values.

Treating all larger-scale mature mangrove removal activities as discretionary also:

- Avoids the need for investigations to identify specific locations where different approaches could be taken; and
- Defers (almost inevitable) dispute over conflicting values, to a time and location where there is public interest.

With regards to the approach permitting seedling removal, Option B identifies particular areas where seedling removal is not permitted, whereas the simplified Option C reflects that no such areas have been identified in Northland. This approach recognises that mangroves are currently expanding and that this can equally have adverse or beneficial effects on these values, and takes an approach that reduced regulation enables a local response to adverse effects of mangrove spread (such as encroachment into wading bird habitat) while allowing the council to monitor adverse effects as a whole, to gauge whether regulation of seedling removal is necessary in some areas. It is anticipated that in areas identified as having elevated natural character or ecological values, there is little probability of adverse effects in these locations given the permitted activity limitations (require only hand tools, no vehicles, avoiding sensitive periods for birds and these sites are often in remote locations where there are fewer conflicts with human activities).

By identifying areas appropriate and not for mangrove removal provisions can be better tailored to manage risk of adverse effects (as is particularly the case in Auckland – Option B). The final measure of minimising the cost to council highlights that to undertake this process involves considerable costs. In some areas this will not reflect a desire to remove mangroves and in other areas may conclude with results that the local community do not agree with. Options A and C avoid this up-front cost and the associated time necessary to undertake the investigations while allowing for case-by-case assessment as and when there is interest, through the resource consent process.

8.12 Marinas

8.12.1 Executive summary

This section evaluates the options for managing marinas in the new Regional Plan. This evaluation supports the following Regional Plan provisions:

- Policy D.5.16 - Marinas – managing effects
- Policy D.5.17 - Benefits of marinas
- Policy D.5.18 - Marina development areas
- Policy D.5.19 - Marinas and moorings in high demand areas
- Rules C.1.1 - General structures

The problems and opportunities for marinas can be summarised as:

- Lack of certainty for the on-going authorisation of marinas;
- The cost of applying for a resource consent to construct a new marina and the low certainty of it being granted;
- The potential missed economic and social benefits of proposed marinas not progressing; and
- The various and potentially significant adverse environmental effects of marinas,
- The exclusive use of the coastal marine area for a marina development can exclude the pubic from using that space which is a common resource.

The construction of a marina can involve a number of activities, which have actual and potential adverse and/or positive effects on the environment. Such activities include:

- Reclamation;
- Dredging and dredging spoil disposal;
- The emplacement of breakwaters, finger jetties and other structures;
- The provision of facilities for sewage and rubbish disposal, refuelling, boat maintenance and water supply;
- Wastewater discharges to coastal waters from land-based facilities;
- The construction of stormwater management systems; and
- Marina developments may require the development of car parking, office buildings, toilet facilities, signage and security infrastructure on land adjoining the coastal marine area.

In order to manage these activities and their effects, council proposes to put policies and rules in place that will allow the assessment and management of the environmental effects of marinas and their development. It will also enable marina development in appropriate locations. The preferred approach (Option C) is summarised below:

- Renewal of resource consents for existing marinas – controlled activity.
- Create a zone (Marina Zone) to address the issues and opportunities for marinas.
- Re-zone existing marinas so they are within a marina zone.
- Re-zone water space in Doves Bay to encourage marina extension.
- Create an overlay to identify the most appropriate locations for marina development, taking demand, natural values, shelter, water depth and land based facilities into consideration.
- Implement policy that recognises the benefits of marina development within a marina development area.
- New marinas in the general coastal zone, mooring zone or marina zone – discretionary activity.
- Water quality – any discharges from the development or operation of a marina must meet the general water quality standards.
- Dredging and reclamation – marina operation and development is subject to the general dredging and reclamation provisions.

8.12.2 Relevant provisions

This evaluation supports the following Regional Plan provisions:

- Policy D.5.16 - Marinas – managing the effects of marinas
- Policy D.5.17 - Recognising the benefits of marina development
- Policy D.5.18 - Marina zones - purpose
- Policy D.5.19 - Marina Zones - Structures
- Policy D.5.20 - Marinas and moorings in high demand areas
- Rules C.1.1 - General structures

8.12.3 The problem, opportunity and/or requirement

The problems and opportunities for the development and operation of marinas can be summarised as:

- Marinas involve the allocation of the common coastal marine area and can not be undertaken without resource consent or through a permitted activity in a regional plan.
- Lack of certainty for the on-going authorisation of marinas.
- The cost of applying for a resource consent to construct a new marina and the low certainty of it being granted.
- The potential missed economic and social benefits of proposed marinas not progressing.
- The various and potentially significant adverse environmental effects of marinas. Northland Regional Council, 2014. *Moorings and Marinas Strategy for Northland*

There are currently six purpose-built marinas in Northland ranging in size from 25-300 berths:

- Tutukākā Marina at the head of Tutukākā Harbour,
- Orams Marina in the Hātea River, upper Whangārei Harbour,
- Riverside Marina in the Hātea River, upper Whangārei Harbour,
- Marsden Cove Marina, in the outer Whangarei Harbour,
- Doves Bay Marina in the lower Kerikeri Inlet,
- Ōpua Marina,
- Whangaroa Marina in Whangaroa Harbour.

In addition, there are a number of high-density pile and/or jetty mooring areas, which are generally referred to and managed as marinas. These are at Kissing Point and the Town Basin in the Whangārei Harbour and at Tinopai in the Kaipara Harbour.

Over the years, there have been a number of proposals for marina developments in Northland that have not been developed. Black Smiths Bay (Kerikeri), Veronica Bay(Opua), Kerikeri Inlet, Kissing Point (Whangārei), Parua Bay (Whangārei), Old Oak (Mangonui) and One Tree Point (Whangārei).

The cost of applying for a resource consent to construct a new marina and the low certainty of it being granted have been highlighted as significant barriers to the development of marinas by marina developers Northland Regional Council, 2014. *Moorings and Marinas Strategy for Northland*.. Also, there is no long-term certainty for marinas. Resource consents can only be granted for a maximum of 35 years, and to date, 35 years is typically the consent duration given for marina resource consents in Northland. While 35 years provides enough time to justify initial investment in a marina, there is a risk that consent durations for future resource consents are less.

With their rigid floating mooring structures, marinas can accommodate more craft per unit area than other types of moorings. Marinas can also provide increased security and a range of support facilities for sewage and rubbish disposal, freshwater and fuel supplies.

Marinas can provide significant economic benefits during their construction and through their ongoing operation by attracting boat owners from outside the region. The following is a summary of the contribution an additional four x 250 berth marinas would make to Northland's economy through construction and ongoing operation Northland Regional Council, 2012. *Economic effects of further marina development in the Bay of Islands* .:

One-off impacts during construction of each 250 berth marina:

- The direct employment of 53 full-time equivalent persons;
- Increase Northland's gross domestic product (GDP) by $4.3 million and household income by $3.4 million;
- Including the flow-on effects (indirect and induced) increases the GDP impact to $9.7 million and creates 115 full time equivalent jobs.

On-going impacts of 1000 additional marina berths:

- On-going economic impacts arise from increased expenditure by owners of marina berths on boat maintenance and boat use;
- An annual expenditure per berth of $12,600;
- Contributing an estimated $6 million to the Northland economy each year from outside the region;
- Flow-on effects lead to a total annual GDP impact of $4.8 million, a lift in household income of $3.2 million per annum and the creation of 71 additional full-time equivalent jobs.

While marinas have their benefits, they are also one of the most concentrated forms of development in the coastal marine area and consequently tend to significantly modify the natural environment within their footprint. Marinas generate many of the same effects as mooring areas. However, the level of effects tends to be different due to the concentration of vessels and the provision of land-based services. For instance, the effects from anti-foul leachate and the modification of natural water flow patterns tend to be greater and the effects on land-based facilities and of sewerage discharges tend to be less.

The construction of a marina can involve a number of activities, which have actual and potential adverse and/or positive effects on the environment. Such activities include:

- Reclamation
- Dredging and dredging spoil disposal
- The emplacement of breakwaters, finger jetties and other structures
- The provision of facilities for sewage and rubbish disposal, refuelling, boat maintenance and water supply
- Wastewater discharges to coastal waters from land-based facilities
- The construction of stormwater management systems
- Marina developments may require the development of car parking, office buildings, toilet facilities, signage and security infrastructure on land adjoining the Coastal Marine Area.

The Moorings and Marinas Strategy for Northland, 2014 was developed to investigate and plan for present and future demand for on-water boat storage in the Bay of Islands. The strategy has a 20-year horizon and identifies a number of options to provide for on-water boat storage the strategy was developed with input from the public through focus groups, submissions and hearings. The strategy Identifies sites at Ōpua and Doves Bay that are suitable for marina extensions. The strategy proposes that this be facilitated through zoning, to provide for marina activities.

8.12.4 Management options

This section summarises the management options for marinas.

The management options do not cover;

- new marinas in significant marine areas – the general issue of development in Significant Marine Areas is covered in 9.4 'Outstanding and significant natural areas'.
- zoning for new marina development on greenfield sites.

Submitters on the draft Regional Plan sought marina zones in Mangonui, the Hatea river in Whangarei and Taiharuru Estuary. In order to set aside common coastal marine area for use as a marina by designating a site a marina zone council needs to have confidence that the site is physically suitable for marina development and that marina development is an appropriate use of coastal space, taking into account other potential uses/ users . At the time of writing this report Council does not have information that suggest that zoning for marina development in the Hatea river, Taiharuru Estuary or Mangonui Harbour is the appropriate. Therefore marina zoning in those locations has not been included in the proposed regional plan.

While the draft New Regional Plan zoned most existing marinas as marina zones it did not include a marina zone around the existing Riverside Drive Marina, in Whangarei. This was an error which has been corrected.

In respect to the proposed marina zone at Doves Bay Council does have information to suggest that the site is physically viable for marina development insert reference to harbour board report on Doves Bay .

The options considered in this report, including the proposal for a marina zone at Doves Bay, have been informed by the Moorings and Marinas Strategy, which was prepared between 2012 and 2014 in consultation with the public, iwi and marina developers. The collaborative approach used to develop The Strategy and the subsequent submissions and hearings processes indicate that it is appropriate to zone Doves Bay as a Marina Zone.

In addition the Strategy made a number of general recommendations for the management of moorings and marinas across Northland as well as some specific recommendations which have informed the options considered in this report –see www.nrc.govt.nz/mmstrategy for more information.

The key matters to decide on are:

- Rules for renewal of resource consent for existing marinas;
- Rules and/or policies for Ōpua and Doves Bay marina expansion areas;
- Policies for recognising benefits of marinas; and
- Policies guiding the management of the adverse effects specific to marinas.

The current discretionary status for marina development outside marina zones (Marine Management Area 4) is uncontentious and therefore does not require change and therefore assessment. While we are not proposing to change the activity status for out of zone marina development, this activity has been included to help demonstrate the influence of various policy options.

Option A: passive approach

Overview: This is essentially a 'hands off' approach with no policy direction around marina development.

Background: this is neutral approach, with no policy guidance to developers or decision makers. Applications for new marina development and renewal of resource consents for existing marinas are discretionary, meaning decision makers can approve or decline an application.

Renewal	Marina development - out of zone	Marina development - in zone	Benefits of marinas policy	Adverse effects of marinas policy
Discretionary	Discretionary	Discretionary	No policy	No specific policy - water quality policies and limits still apply

Option B: developer-led approach

Overview: gives some recognition to the benefits of marinas and acknowledges the adverse effects through policy. This option does not include zones, developers are free to determine the best site for marina development without guidance from the plan.

Background: this option has been developed by staff and is based on the premise that marina developers to the best people to determine where marina development can occur. In respect to renewal of resource consents for existing marinas, this option restricts the matters the council can consider when determining to either decline a resource consent, or to grant consent and impose conditions. In this case discretion is restricted to environmental matters such as water quality, lighting, noise and biosecurity.

Renewal	Marina development - out of zone	Marina development - in zone	Benefits of marinas policy	Adverse effects of marinas policy
Restricted-discretionary.	Discretionary	Discretionary	Recognition of the benefits of marinas.	Identification of the key adverse effects of marinas and guidance on how the effects should be managed.

Option C: zone-based approach

Overview: recognises the value of marinas while still acknowledging the adverse effects, encourages development in and around existing marinas, while maintaining option for development outside marina zones.

Background: this is a middle of the road approach that has been developed by staff to provide guidance around the benefits and environmental effects of marinas. In respect to renewal of resource consents for existing marinas, this option promotes a controlled activity status for existing structures in a marina zone. An application for a controlled activity cannot be declined but conditions can be put in place to manage effects.

Renewal	Marina development - out of zone	Marina development - in zone	Benefits of marinas policy	Adverse effects of marinas policy
Controlled	Discretionary	Discretionary	Recognition of the benefits of marinas.	Identification of the key adverse effects of marinas and guidance on how the effects should be managed.

8.12.5 High level objectives and measures

Section 32 requires an assessment of *"...the efficiency and effectiveness of the provisions in achieving the objectives..."*. Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section Evaluation approach for more details.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. They signal a direction for where we want to head, without stating how far we go – that comes later (they are the beginnings of objectives).

Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against.

High level objective	Measure
Minimise the adverse effects of marinas on the environment.	The likely weight given to adverse environmental effects in resource consent decision-making: 1 = no consideration of adverse effects. 2 = some consideration of adverse effects, but significant effects may be allowable. 3 = moderate effects acceptable, but not significant effects. 4 = moderate adverse effects may be acceptable. 5 = adverse effects limited to minor effects at most.
Maximise the certainty of the resource consent process for marina developers and owners of existing marinas.	Certainty of resource consent being granted for an application: 1 = won't/can't be granted (for example, prohibited activity). 2 = small chance of being granted. 3 = 50/50 chance of being granted. 4 = will generally be granted unless there are exceptional circumstances. 5 = guaranteed (for example, controlled activity).

Explanation for the high level objectives and measures

Minimise the adverse effect of marinas on the environment.

This measure is based on staff judgement. It seeks to establish the potential level of environmental effect that may occur under any of the proposed management regimes. The measure is based on the level of consideration of environmental effects provided for under an option and therefore the level of control council is likely to place on a developer or marina operator. This assessment takes into account environmental effects during construction and the effects of operating a marina.

Where no consideration is given, it is expected there will be a very low level of emphasis on environmental controls and therefore there will be, for example discharges of sediment, sea bed disturbance, poor storm water control, and extensive reclamation.

A middle of the road score of 3 would see some environmental effects from reclamation, temporary sediment discharges during construction and a reduction of water quality within the marina but only a low reduction in water quality outside the marina.

A high score of 5 would be awarded if there are only temporary effects on the environment during construction, minor water quality reduction within the marina and no detectable reduction in water quality outside the marina or perhaps an overall improvement in environmental outcome as a result of the development.

Maximise the certainty of the resource consent process for marina developers and owners of existing marinas.

Consultation on the Moorings and Marinas Strategy in 2013/14 revealed that the biggest hurdle to marina development nationally was the uncertainty of a resource consent being granted. This measure seeks to evaluate the level of certainty of a marina being granted for each of the options being considered.

High level objectives not included

Section 32 requires an assessment of the impacts on economic growth and employment opportunities (s32(2)(a)). However, the impact of the management options on economic growth and employment opportunities is imperceivable and/or can't be determined with any confidence. Therefore, economic growth and employment opportunities have not been included as high level objectives. For more information go to the section 1.7 'Assessing impacts on economic growth and employment opportunities'.

In some cases, the development of marinas displaces existing swing moorings. Marina berths are generally more expensive than swing moorings. The replacement of relatively cheap swing moorings with more expensive marina berths can impact on the ability of some people to participate in boating. This report does not attempt to quantify the socio-economic impact of the shift from swing moorings to marina berths.

It is assumed that a mix of mooring options will continue to be provided into the future.

8.12.6 Evaluating the management options

High level objective and measure	Option A: passive approach	Option B: developer-led approach	Option C: zone-based approach
Minimise the adverse effect of marinas on the environment. *Measure:* The likely weight given to adverse environmental effects in resource consent decision-making: 1 = no consideration of adverse effects. 2 = some consideration of adverse effects, but significant effects may be allowable. 3 = moderate effects acceptable, but not significant effects. 4 = moderate adverse effects may be acceptable. 5 = adverse effects limited to minor effects at most.	4	2-3	3
Maximise the certainty of the resource consent process for marina developers and owners of existing marinas. *Measure* Certainty of resource consent being granted for an application: 1 = won't/can't be granted (for example, prohibited activity). 2 = small chance of being granted. 3 = 50/50 chance of being granted. 4 = will generally be granted unless there are exceptional circumstances. 5 = guaranteed (for example, controlled activity).	Renewal = 3; New Marinas - in zone = 3; new marinas - out of zone = 3.	Renewal = 4; New Marinas - in zone = 3; new marinas - out of zone = 3.	Renewal = 5; New Marinas - in zone= 4; new marinas 0out of zone= 3-4.

Certainty about the evaluation

There is always uncertainty about the potential impacts of management options. We're moderately to highly confident about the accuracy of the evaluation for all the options. We don't think it would be viable and/or worthwhile to get more information to increase the accuracy of our evaluation. The main reason being that it is very unlikely to change the relative differences between the options. They are a judgement and inherently a judgement of people's responses has a degree of uncertainty.

Time-frame of the evaluation

The evaluation is made over the life-time of the plan (10-15 years).

The preferred management option

The preferred management option for the Regional Plan is Option C. It provides for intensive boat storage to meet demand in locations where marina zones are deemed to be appropriate, while still maintaining the opportunity for development to occur out of zone. This provides some flexibility for the industry to meet demand for on water boat storage.

In zone or out of zone development will be required to demonstrate that environmental issues are considered and mechanisms to manage environmental effects can be put in place. The resource consent process is used to ensure this happens.

Option C is centred around identified marina zones. In order for a marina zone to be identified in the plan an assessment must determine that the area is appropriate for marina development. In this case 'appropriate' means the site is:

- Physically capable of being used for a marina (depth, shelter, access);
- The area is likely to have sufficient demand within the life-time of the plan;
- That it is possible to manage environmental effects to an acceptable level;
- The zone is not within or immediately adjacent to an Identified Significant Natural Area; and
- Balancing the need for boat storage with other uses of the coastal marine area.

Option C is considered to provide a more balanced approach than options A and B and provides a more certainty to both developers and the public.

8.13 Coastal occupation charging

Section 64A of the RMA requires regional councils to decide whether or not to impose a coastal occupation charging regime. They must then amend their regional coastal plans to either establish the charging regime or explicitly state that no charges will be imposed.

Coastal occupation charging regimes are a type of rental for the private occupation of public coastal space and are a payment to the community (via the council) based on the extent to which public benefit is lost and the extent of private benefit gained. The regimes apply to persons occupying any part of the common marine and coastal area (as defined in the Marine and Coastal Area Act 2011). They do not apply to any area of private title, or to persons carrying out a protected customary right, or to any person or group that holds customary marine title. The RMA states that the revenue must be spent on promoting the sustainable management of the coastal marine area.

There is no obligation to spend the revenue on actions that directly or indirectly benefit those paying the charges. The revenue generated from coastal occupation charging regimes therefore may be used on such things as:

- Enhancement of marine water quality.
- Removal of derelict structures.
- Providing public facilities and improving public access to the marine area.
- Coastal restoration and enhancement.

Constraints on developing a charging regime

The provisions of the RMA are unclear as to the nature of coastal occupation charges. For example, are the charges to be compensation for the loss of space or a rental based on private benefits gained, or a combination of both? This uncertainty makes it very difficult for councils to answer the questions raised in section 64A(1), namely:

- What, or to what extent, has the public lost or gained in terms of private occupation of public space?
- What are the private benefits gained from the occupation?

Other key issues are:

1) There is no clear or established methodology to 'value' coastal space. Without an agreed methodology there is potential for significant inconsistencies between regional councils intending to pursue a charging regime. The potential for differing levels of charging could mean that marine activities may be discouraged in a region with high occupation charges and relocate to a region with lower or no charges.
2) The lack of clarity over the nature of coastal occupation charges outlined above has made it very difficult to determine a method for calculating the level of charges. For instance, should charges be indexed to the cost of coastal management initiatives, or be compensation for loss of public space? If a rental model is used, is it to be based upon the area occupied or the private benefits gained? It is also agreed by most regional councils that there should be a nationally applied methodology for reasons of equity and consistency, yet no such system has emerged.
3) There are significant equity matters, particularly with transitional permits (such as those applying to port occupied areas under s384A RMA) potentially being exempt from charges – the legal position is still unclear in this regard.
4) The removal of land in the coastal marine area from Crown ownership as a result of the Marine and Coastal Area Act 2011 potentially creates an additional barrier to implementation. Section 401B of the RMA places a requirement on existing consents to pay coastal occupation changes once they are introduced to a plan; however, this section specifically refers to 'land of the Crown' in the coastal marine area. Therefore, existing consents could potentially be exempt from coastal occupation charges, creating further inequity.
5) Due to the long period of time that we (and most other regions) have been without occupation charges, many occupiers have no history of paying for their space, and have developed the expectation that they should not have to.

6) A full Schedule 1 RMA process is required, which will be costly and contentious – exasperated by the points identified above. The lack of clarity in the legislation, and the need for councils to justify any charges and any methodology chosen, means there is a high risk of litigation, with considerable uncertainty as to the outcomes, and likely costs for all parties.

7) A lack of presumption – the RMA doesn't state that coastal occupation charges should apply – the default position is that no charges exist. The council has to decide whether charges are appropriate and there is no clear framework or criteria to guide decision-making. This makes any charging scheme vulnerable to legal challenge as the presence or absence of charges must be established from first principles.

Arguments for a charging regime

It needs to be acknowledged that there is an argument for introducing a coastal occupation charging regime. Reasons include:

1) Occupation and use of public space is a privilege, not a right. Charges provide a form of compensation to the community for the loss of access to public space and its reduced amenity.

2) Failure to introduce a charging regime could be appealed to the Environment Court.

3) Private individuals and commercial operators can generate income and profit from 'free' use of public space.

4) A charging regime would generate revenue that could be used to sustainably manage the coastal marine area and even offset rates. Taking a hypothetical example of 3000 structures being charged a flat fee of $100 per annum, equates to $300,000 being generated each year – a substantial sum of money.

Marlborough District Council is the only council currently proposing to introduce a coastal occupation charging regime into their second generation regional planning framework. They have assessed the relative benefits associated with different types of coastal occupation and consider that charging for occupation of coastal space is justified in principle, in circumstances where the private benefit is greater than public benefit.

Conclusion

While there is an argument for establishing a coastal occupation charging regime, there are also multiple reasons not to (at this stage), as outlined in this report. There is only one council currently looking to introduce a coastal occupation charging regime into their new regional plan (Marlborough). The outcomes of this process (as it will need to go through a formal RMA Schedule 1 process) will provide valuable lessons for other councils.

It is recommended that council does not propose to introduce a charging regime in the notified regional plan. This position can be reconsidered post public notification, hopefully after learning from the Marlborough experience. There is the potential to progress this work as a 'stand-alone' plan change or variation to the new plan, meaning that it would be subject to its own Schedule 1 process.

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9 Significant natural and historic heritage

9.1 Legal background

RMA (including regulations)

Section 5(2)(b) (the section outlining the purpose of the RMA) includes safeguarding the life-supporting capacity of water/ecosystems as a key 'limb'. This is underpinned by Section 6 (matters of national importance) and Section 7 (other matters).

Consideration of outstanding natural features, outstanding natural landscapes, natural character and historic heritage are all included in Section 6 RMA as matters of national importance. All four must be protected from 'inappropriate subdivision, use and development'. Significant indigenous biodiversity is also included in Section 6 RMA as a matter which must be protected. The relationship of Māori and their culture and traditions with their ancestral lands, water, sites, wāhi tapu, and other taonga is also a matter of national importance.

The RMA however does not specify what methods must be used to protect outstanding natural features and landscapes from 'inappropriate' subdivision, use and development, nor does it define inappropriate subdivision, use and development. Whatever methods are chosen, councils must control those activities that adversely affect the elements which make the landscape/feature outstanding. The RMA also does not specify the protection of historic heritage as a specific function of either regional or district councils. However, when regional and district councils are carrying out their other functions, they must recognise and provide for the protection of historic heritage as a matter of national importance.

The extent of the regional council's functions are outlined in Section 30 RMA. Of particular relevance for this resource area are:

- S30 (a) which gives regional councils the general function to develop objectives, polices and methods to achieve the integrated management of physical and natural resources.
- S30 (b) gives regional councils a function to develop objective and policies to manage effects on land of regional significance.
- S30 (c) gives regional councils the ability to the control the use of land for the purposes of water quality and quantity, soil conservation and indigenous biodiversity.
- S30 (d) gives regional councils a wide array of powers to control use and development in the coastal marine area.
- S30 (e) gives regional councils the ability to develop rules to control the use of water and (fa) gives regional councils the ability to allocate the resource.
- S30 (ga) gives regional councils the ability to develop objectives, polices and methods to maintain indigenous biodiversity. This clause was added through amendments to the RMA in 2005, postdating the adoption of Northland's regional plans.

The above functions give regional councils a wide degree of latitude to control adverse effects from use and development on indigenous biodiversity, outstanding natural landscapes, outstanding natural features, natural character and historic heritage in the coastal marine area. Additionally, there is scope to control land and water use to, among other things, protect indigenous biodiversity and natural character (and to a lesser extent outstanding landscapes and outstanding natural features).

When preparing or changing any regional plan, section 66(2)(c)(iia) requires that regional councils have regard to "[any] relevant entry on the New Zealand Heritage List/Rārangi Kōrero required by the Heritage New Zealand Pouhere Taonga Act 2014" to the extent that it has a bearing on resource management issues of the region. The New Zealand Heritage List/Rārangi Kōrero is a repository of information about recognised significant historic heritage places. Heritage New Zealand does not regulate proposed changes to these listed places, but makes recommendations to local authorities as part of the identification process.

King Salmon

Policies 11(a), 13(1)(a) and 15(a) of the New Zealand Coastal Policy Statement 2010 direct that adverse effects on the qualities and characteristics of the prescribed outstanding/significant matters must be avoided. The King Salmon case[1] confirmed that these policies set a bottom line, that is, a regional plan cannot contain provisions that would by default result in such

1 *Environmental Defence Society Inc. versus the New Zealand King Salmon Co Ltd. (2014) NZSC 38.*

adverse effects occurring (except potentially minor and transitory effects). This means that it will be extremely difficult to justify a permitted or controlled activity status for activities that may cause adverse effects on the Coastal Policy Statement policy 11(a), 13(1)(a) and 15(a) matters.

Treaty settlements and statutory acknowledgements

Statutory acknowledgements

A statutory acknowledgement is a formal recognition by the Crown of the particular cultural, spiritual, historic, and traditional associations that an iwi has with a statutory area.

Statutory acknowledgements may apply to land, rivers, lakes, wetlands, landscape features or a particular part of the coastal marine area. Where a statutory acknowledgement relates to a river, lake, wetland or coastal area, the acknowledgement only applies to that part of the bed in Crown ownership or control.

Councils must:

1) forward summaries of all relevant resource consent applications to the relevant claimant group governance entity - and to provide the governance entity with the opportunity to waive its right to receive summaries
2) have regard to a statutory acknowledgement in forming an opinion as to whether the relevant claimant group may be adversely affected in relation to resource consent applications concerning the relevant statutory area
3) within the claim areas, attach for public information a record to all regional policy statements, district plans, and regional plans of all areas affected by statutory acknowledgements.

Statutory acknowledgements in Northland

Refer 2 'Statutory acknowledgements and iwi/hapū management plans'.

Other laws

Marine and Coastal Area Act 2011

This Act replaced the Foreshore and Seabed Act 2004 and established a new regime for the recognition of Māori customary rights and title over the 'common marine and coastal area'. The common marine and coastal area includes the marine and coastal area, excluding freehold title and areas owned by the crown as conservation areas, national parks or reserves. The Act sets out that neither the Crown nor any other person can own, or is capable of owning, the common marine and coastal area.

S20 – crown deemed to be owners of abandoned structures: if ownership of structures cannot be determined, the regional council must undertake an inquiry to determine the identity or whereabouts of the owner. If ownership cannot be established then the structure is deemed to be abandoned and the crown (DOC) is deemed to be the owner.

Protected customary rights (for example, rights to launch waka or gather hangi stones): a consent authority cannot grant a resource consent for an activity in a protected customary rights area if the activity will, or is likely to, have more than a minor adverse effect on the exercise of protected customary rights, unless the relevant group gives its written approval or the activity is exempted as an accommodated activity.

Customary marine title: this gives right-holders the ability to give or withhold permission to resource consent applications, protect wāhi tapu areas or create a planning document for the area.

If an iwi, hapū or whanau group has applied for, but not yet been granted, customary marine title over the relevant marine and coastal area, then a resource consent applicant will have to notify the group and seek the group's views before lodging the consent application.

If customary marine title has been recognised over the marine and coastal area, then, for most activities, a resource consent applicant will have to obtain permission from the group which holds customary marine title before a resource consent can commence. There is no right of appeal or objection to a refusal of permission (nor presumably to the conditions on which permission is granted).

Reserves Act 1977

This Act offers tools to provide public access to and along the coast, including through mechanisms such as marginal strips and esplanade reserves, which can be required as part of a resource consent for subdivision. These are transferred to the territorial authority.

Local Government Act 2002

The Local Government Act gives councils the ability to set bylaws within their respective region or district. For example, section 145 gives authority to district councils to adopt bylaws to regulate activities which can be carried out on roads, in public places and in reserves. This provision enabled them to introduce the '*Vehicles of Beaches Bylaw 2009*', which is intended to regulate the use of vehicles on the district's beaches. The regional council's '*Navigation and Safety Bylaw 2012*' was also produced under the Act.

Heritage New Zealand Pouhere Taonga Act 2014:

(supersedes the Historic Places Act 1993).

The new Act means that Heritage New Zealand must develop and adopt statements of general policy for administering archaeological sites, historic places that it controls, the Heritage List and the Landmarks List, and its statutory advocacy role. [Section 16] This is a public process, and councils might consider participating at the policy level to advocate on policies relevant to them. [Section 7].

Declarations of post 1900 archaeological sites by Heritage New Zealand must be notified to local authorities, which will need to decide how to record that information. [Section 43]

Applications to modify or destroy archaeological sites can specify that the applicant believes the effects will be no more than minor. If that is accepted by Heritage New Zealand and the application is adequate, then Heritage New Zealand must grant the application within five working days. If the application is not granted, it must be rejected within that time frame. [Sections 44 and 47] This is a significant new provision.

The Heritage New Zealand List replaces the current register for historic places, historic areas, wāhi tāpuna, wāhi tapu, and wāhi tapu areas, and the current Category 1 and Category 2 clarifications remain. Heritage New Zealand must give to territorial authorities a list of all entries in the New Zealand Heritage List and heritage covenants, within their jurisdictions. More important, places and areas on the list, and heritage covenants must be entered on Land Information Memorandums and included in project information memoranda issued under the Building Act. [Section 76]

Local authorities are required to have particular regard to recommendations from Heritage New Zealand in respect of historic areas, and the Māori Heritage Council in respect of wāhi tapu areas, as to appropriate conservation and protection of those areas. The interests of owners, so far as they are known, must be recognised in any recommendations. [Section 74]

There is a new concept of a list of National Historic Landmarks. These must have outstanding historic physical or cultural significance and there must be broad national and community support for their inclusion. Inclusion is by the decision of the Minister, and needs the consent of the owner who must have an approved risk management plan. We expect many councils will be involved in the list of National Landmarks either as the owner of landmark places, or through being asked to support applications. National Historic Landmark status may, in time, make it easier to attract government funding for matters such as earthquake strengthening, and, of course, increase pressure on councils to care for their landmarks and to provide funding for those landmarks in its jurisdiction that it does not own. [Sections 80 to 84]

9.2 Planning documents

New Zealand Coastal Policy Statement 2010

Under the RMA, the only mandatory national policy statement is the NZ Coastal Policy Statement (coastal policy statement). Its purpose is to state policies in order to achieve the purpose of the Act in relation to the coastal environment of New Zealand. Councils are required to amend their plans to give effect to coastal policy statement provisions that affect their respective documents as soon as practicable and councils, when considering an application for a resource consent and any submissions received, must have regard to any relevant provisions of the coastal policy statement.

The current coastal policy statement contains 29 policies and took effect in December 2010. The previous one came into effect in 1994 and our operative regional policy statement and operative regional coastal plan were prepared under this regime and therefore 'give effect' to the previous coastal policy statement.

It is more directive than the previous coastal policy statement and focuses on 'avoiding' adverse effects, particularly in relation to significant values (such as outstanding natural character and threatened species), in order to address cumulative effects.

The 'coastal environment' is not defined under the RMA and policy 1 of the coastal policy statement is entitled *Extent and characteristics of the coastal environment*. This policy requires councils to recognise that the extent and characteristics of the coastal environment vary from region to region and locality to locality but that it includes:

1) The coastal marine area;
2) Islands within the coastal marine area;
3) areas where coastal processes, influences or qualities are significant, including coastal lakes, lagoons, tidal estuaries, saltmarshes, coastal wetlands, and the margins of these;
4) Areas at risk from coastal hazards;
5) Coastal vegetation and the habitat of indigenous coastal species including migratory birds,
6) Elements and features that contribute to the natural character, landscape, visual qualities or amenity values;
7) Items of cultural and historic heritage in the coastal marine area or on the coast;
8) Inter-related coastal marine and terrestrial systems, including the intertidal zone; and
9) Physical resources and built facilities, including infrastructure, that have modified the coastal environment.

This is arguably the most important policy in the entire coastal policy statement because it essentially defines the landward extent of the coastal environment for a region or district. Once established, councils (and land owners) can have a level of certainty as to which areas of the region/district the coastal policy statement applies.

Relevant policies to this topic include:

Outstanding natural character and outstanding landscapes/natural features (Policies 13, 14 and 15)

The New Zealand Coastal Policy Statement 2010 reinforces the duties in the Section 6 RMA and goes further by requiring that adverse effects on outstanding natural features and landscapes, and outstanding natural character areas in the coastal environment, are avoided. It also provides criteria to be used to identify (map) such areas and requires regional policy statements and plans to identify where this protection is needed. The effect of the recent King Salmon decision means that the plain meaning of 'avoid' is to be read as just that, all effects must be avoided. If this cannot occur then it is inferred from the decision that the activity is inappropriate.

Historic heritage (Policy 17)

The coastal policy statement directs that historic heritage be protected from inappropriate development through its identification and assessment. Direction is also provided on facilitating integrated management (where, for example, historic heritage traverses mean high water springs) along with protection methods to be included in regional and district plans.

Indigenous biodiversity (Policy 11)

As for outstanding natural landscapes/outstanding natural features and outstanding natural character, the coastal policy statement (Policy 11a) goes further than the RMA with respect to indigenous biodiversity by requiring the avoidance of adverse effects on specific attributes of significant indigenous biodiversity in the coastal environment. These attributes are listed in the coastal policy statement and include threatened or at risk species and/or habitats. The identification of such areas will, in the light of the King Salmon decision, set a very high bar for effects to be avoided.

Policy 11b of the coastal policy statement requires the avoidance of significant adverse effects on other indigenous biodiversity (and provides examples of these species and habitats).

Regional Policy Statement for Northland

The Regional Policy Statement (policy statement) applies direction to regional and district councils in managing these areas. It divides functions largely on the basis of sections 30 and 31 RMA, namely that regional plans are to manage these resources in fresh and coastal water bodies with district plans covering the effects of subdivision and modification on land. Heritage values on land are the responsibility of district councils with regional council fulfilling this function in the coastal marine area. This influences the scope of this work stream, which primarily looks at the state of the resource, resource management issues and the effectiveness and efficiency of regional planning mechanisms to date – it does not address historic/cultural heritage, natural features/landscape or natural character management in district plans. However, there is still a need for consistent management between district and regional planning as natural and heritage/cultural values often span administrative or planning boundaries (for example, district, coastal marine area and 'coastal environment' boundaries).

Outstanding natural landscapes/outstanding natural features and natural character

The policy statement uses criteria in Policy 1, 13 and 15 of the coastal policy statement to identify the extent of the coastal environment, natural character within the coastal environment and outstanding natural features and landscapes across the region. In this way, the policy statement aims to achieve regional consistency for the management of these areas of national importance. The policy statement then directs councils to avoid adverse effects on outstanding natural features and landscapes, and outstanding natural character areas in the coastal environment and includes regulatory methods to achieve this. The document does clarify that an activity may be appropriate where effects are minor or otherwise transitory. It also includes policy to give effect to coastal policy statement Policy 6, to enable appropriate use and development (for example, where land is already zoned for residential use).

Outside the coastal environment, integrity is to be maintained by avoiding significant adverse effects. A large proportion of outstanding natural features and landscapes are located outside the coastal environment (for example, Kai Iwi Lakes, Lake Ōmāpere). There are also areas of natural character outside the coastal environment where the policy statement includes direction that vegetation clearance/modification be minimised (these areas are not specifically identified in maps).

Historic heritage

The policy statement includes criteria to assist councils to identify historic heritage (giving effect to coastal policy statement Policy 17). Methods in the policy statement give direction to apply this policy through the mapping or scheduling of historic heritage where it meets the criteria. A general direction is included to avoid significant adverse effects on historic heritage. The policy statement directs district councils to manage historic heritage on land and the regional council to manage assets within the coastal marine area and in the beds of lakes and rivers.

Indigenous biodiversity

The policy statement provides criteria in Appendix 5 of the document to assist in identifying the attributes of significant indigenous biodiversity.

The intent of the appendix is to give effect to coastal policy statement Policy 11a, requiring the identification of significant indigenous biodiversity within a Northland context. Specific regulatory direction is included in the policy statement to avoid adverse effects on significant indigenous biodiversity in the coastal environment and to avoid, remedy or mitigate to the extent effects are no more than minor in areas outside the coastal environment. The policy statement also requires the avoidance of significant adverse effects for indigenous biodiversity that falls under coastal policy statement Policy 11b. The application applies in the coastal environment and outside the coastal environment.

Iwi/hapū environmental management plans

The following iwi resource management documents have provisions relating to significant natural and historic heritage:

- Ngāti Wai Environmental Management Plan;
- Ngāti Hine Environmental Management Plan;
- Kororareka Marae Environmental Management Plan;
- Te Uri O Hau Environmental Management Plan;
- Ngāti Rehia Environmental Management Plan;
- Te Roroa Environmental Management Plan;
- Patuharakeke Environmental Management Plan;
- Mangakāhia Marae Komiti Environmental Management Plan;
- Ngāti Kuta Environmental Management Plan;
- Whaingaroa Iwi Resource Management Plan; and
- Nga Hapu o Te Wahapu o Hokianga nui a Kupe Environmental Management Plan.
- Whatitiri Resource Management Plan

All of these plans cover the issues in some detail. In summary, common themes across the plans include:

- Recognising the relationship of tangata whenua and their culture and traditions with their ancestral lands, water, sites, wāhi tapu and other taonga in resource management processes.
- Recognising tangata whenua as the kaitiaki of wāhi tapu.
- Recognising statutory acknowledgements and cultural associations with land and water.
- Identifying, assessing and protecting areas or sites of customary value (including cultural landscapes) in resource management processes.
- Greater involvement of tangata whenua in decision-making (recognising affected party status for resource consents, joint development of planning provisions).
- Greater collaboration with councils, land owners and other agencies to protect cultural landscapes and sites of importance.
- Maintenance and enhancement of the mauri, mana and tapu of cultural landscapes.
- Maintenance of confidentiality of tangata whenua heritage.
- Ceasing of development and consultation with iwi where there are effects on wāhi tapu (including where there are accidental finds).
- Education/awareness raising for landowners.
- Using traditional knowledge to assess the effects of any proposal on iwi (maturanga Māori) and transference of this knowledge to the next generation.
- Monitoring of effects by iwi with appropriate resourcing from council/applicants.

9.3 Historic heritage

9.3.1 Executive summary

This section evaluates the options for managing historic heritage in the new Regional Plan.

The relevant provisions are:

- Rule C.1.1.7 Reconstruction, maintenance or repair of a structure - permitted activity
- Rule C.1.1.10 Removal of a structure - permitted activity
- Rule C.1.1.19 Hard protection structures in areas with significant values - non complying activity
- Rule C.1.1.20, Removal, demolition or replacement of a historic heritage site or part of a historic heritage site - non complying activity
- Rule C.1.1.22 Structures within areas of significant value - non complying activity
- Rule C.1.3.9 Extensions to existing aquaculture in areas with significant values - discretionary activity
- Rule C.1.3.10 Marae-based aquaculture in areas with significant values - discretionary activity
- Rule C.1.3.12 Small scale and short duration aquaculture in areas with significant values - non complying activity
- Rule C.1.3.14 New aquaculture in areas with significant values - prohibited activity
- Rule C.1.5.14 Other dredging, disturbance and disposal activities - non complying activity
- Rule C.1.6.5 New reclamations in areas of significant value - non complying activity
- Rule C.1.8.1 (1), Coastal Works General Conditions
- Rule C.2.1.15 Structures in a significant area - non complying activity
- Rule C.2.1.16 Removal, demolition or replacement of a historic heritage site or part of a historic heritage site - non complying activity.
- Rule C.2.1.17 New flood defence in areas of significant value - non complying activity
- Rule C.2.3 (27) General conditions activities in the beds of lakes and rivers and in wetlands.
- Rule C.3.9 Damming or diversion of water in a significant indigenous wetland or significant area - non complying activity
- Policy D.2.6 Managing adverse effects on historic heritage

The topic concerns historic heritage, which is a matter of national importance under Section 6(f) RMA. Historic heritage is defined very broadly in the RMA (it includes physical, cultural and spiritual sites and landscapes).

The Regional Policy Statement includes criteria to assist councils to identify historic heritage (giving effect to the NZ Coastal Policy Statement (coastal policy statement) Policy 17). Methods in the Regional Policy Statement then give direction to apply this policy through the mapping or scheduling of historic heritage where it meets this criteria. A general direction is included in the Regional Policy Statement to avoid significant adverse effects on historic heritage with district councils directed to manage historic heritage on land and the regional council to manage assets within the coastal marine area and in the beds of lakes and rivers.

The options considered were:

- Option A – modified status quo;
- Option B – moderate protection;
- Option C – stronger protection; and
- Option D – maximum protection.

The preferred management approach (out of four options) is Option C: stronger protection. This is essentially a variation on the current approach where we specifically provide for protection of historic heritage. A tightening of the rules means that removing, replacing or destruction to historic heritage are a non-complying activity. The approach is generally consistent

with that recommended by Heritage New Zealand in its 'Model Rules for RMA Regional and District Plans (historic buildings)'. The focus is on protection but not at any cost. The non-complying activity status allows activities that may affect historic heritage to be considered against tight policy criteria.

Option detail: repair/maintenance	Option detail: alteration	Option detail: new structures (historic heritage areas only)	Option detail: removal, relocation, replacement, destruction	Key policy approach
Repair/maintenance of heritage structures is permitted providing the material and techniques used are sympathetic to the existing structure.	Alteration and repair/maintenance that is not sympathetic to historic heritage is a discretionary activity.	Non-complying activity.	Removal, relocation, replacement or destruction of parts of, or the entirety of the site is a non-complying activity.	Strong policy provides guidance on when heritage assessments should be required. Strong policy provides guidance on when demolition/ relocation might be appropriate.

This option should result in more protection for historic heritage – the assets will be clearly identified in regional plan maps and there are rules and policy in place to protect it. The use of non-complying activity rather than the current permitted activity status for removing historic heritage (the activity is currently permitted in the existing Regional Coastal Plan as historic heritage is essentially treated as any other structure) will mean applicants have to demonstrate why this is the best option. The cost will be higher, for example, a consent will be needed and there may have to be a historic heritage assessment undertaken. Opportunity costs may also be higher – there may be additional restrictions placed on development proposals that might otherwise be able to proceed in the absence of stricter rules. Ultimately however most weight has been put on the ability of the option to give more protection to historic heritage.

9.3.2 Relevant provisions

This evaluation supports the following Regional Plan provisions:

- Rule C.1.1.7 Reconstruction, maintenance or repair of a structure - permitted activity
- Rule C.1.1.10 Removal of a structure - permitted activity
- Rule C.1.1.19 Hard protection structures in areas with significant values - non complying activity
- Rule C.1.1.20, Removal, demolition or replacement of a historic heritage site or part of a historic heritage site - non complying activity
- Rule C.1.1.22 Structures within areas of significant value - non complying activity
- Rule C.1.3.9 Extensions to existing aquaculture in areas with significant values - discretionary activity
- Rule C.1.3.10 Marae-based aquaculture in areas with significant values - discretionary activity
- Rule C.1.3.12 Small scale and short duration aquaculture in areas with significant values - non complying activity
- Rule C.1.3.14 New aquaculture in areas with significant values - prohibited activity
- Rule C.1.5.14 Other dredging, disturbance and disposal activities - non complying activity
- Rule C.1.6.5 New reclamations in areas of significant value - non complying activity
- Rule C.1.8.1 (1), Coastal Works General Conditions
- Rule C.2.1.15 Structures in a significant area - non complying activity
- Rule C.2.1.16 Removal, demolition or replacement of a historic heritage site or part of a historic heritage site - non complying activity.
- Rule C.2.1.17 New flood defence in areas of significant value - non complying activity

- Rule C.2.3 (27) General conditions activities in the beds of lakes and rivers and in wetlands.
- Rule C.3.9 Damming or diversion of water in a significant indigenous wetland or significant area - non complying activity
- Policy D.2.6 Managing adverse effects on historic heritage

9.3.3 The problem, opportunity and/or requirement

Under the RMA, historic heritage means:

(a) those natural and physical resources that contribute to an understanding and appreciation of New Zealand's history and cultures, deriving from any of the following qualities:

(i) archaeological,

(ii) architectural,

(iii) cultural,

(iv) historic,

(v) scientific,

(vi) technological, and

(b) includes—

(i) historic sites, structures, places, and areas; and

(ii) archaeological sites, and

(iii) sites of significance to Māori, including wāhi tapu, and

(iv) surroundings associated with the natural and physical resources.

There are several (sometimes overlapping) mechanisms for protecting historic heritage in New Zealand with a number of different bodies involved.

The Heritage New Zealand Pouhere Taonga Act 2014 provides the statutory basis for the protection of nationally listed sites. This national list is maintained by Heritage New Zealand and is divided into five parts:

- Historic Places – such as archaeological sites, buildings, memorials:
  - Category 1 historic places are of special or outstanding historical or cultural significance or value; or
  - Category 2 historic places are of historical or cultural significance or value; and
- Historic Areas – groups of related historic places such as a geographical area with a number of properties or sites, a heritage precinct or a historical and cultural area,
- Wāhi Tūpuna - places important to Māori for ancestral significance and associated cultural and traditional values,
- Wāhi Tapu – places sacred to Māori in the traditional, spiritual, religious, ritual or mythological sense such as maunga tapu, urupā, funerary sites and punawai, and
- Wāhi Tapu Areas – areas that contain one or more wāhi tapu.

Entry on the list for most heritage does not automatically confer protection. Only inclusion on a district or regional plan schedule and corresponding rules means the site is protected. The exceptions are archaeological sites. These are afforded statutory protection under the Heritage New Zealand Pouhere Taonga Act 2014, if dating to before 1900 and an application has to be made to Heritage New Zealand to modify or destroy an archaeological site. Sites after 1900 are not captured by this and the default is that they do not have protection under the Heritage Act (they need to be specifically gazetted by Heritage New Zealand in order to be protected in this way).

Heritage New Zealand can act as an advocate for the inclusion of list items in district and regional plans and local authorities are required to notify Heritage New Zealand if a building consent application is received regarding a property on the list. This allows Heritage New Zealand to offer conservation advice to property owners and the local authority.

Even with statutorily protected archaeological sites, issues may arise where activities are proposed to take place near to an archaeological or groups of archaeological sites. Of particular concern is large-scale earthworks (or foreshore or seabed disturbance) which may have a significant adverse effect if not properly managed. This is where rules in a district or regional plan can be helpful by controlling these activities around archaeological sites. Many archaeological sites however are not well defined and have not been assessed as to their individual significance. Often sites will not be a good example of their type due to accumulated damage and disturbance over the years. However, there may be a few that are more significant and therefore worth being recorded in the new regional plan.

The basis for protection under the Resource Management Act is through Section 6(f) where historic heritage is seen as a matter of national importance. District councils have the biggest role to play through controlling land use and subdivision and by virtue of the fact that most recorded historic heritage is on land. Under Section 30 of the RMA, regional councils have traditionally had responsibility for protection of Section 6 matters in the water (the coastal marine area, beds of lakes and rivers). Yet current regional plans (such as the regional coastal plan) do not contain any identified (scheduled) or mapped historic heritage or any methods for identification.

Given there is no mapping of historic heritage in existing regional plans, there is an absence of rules governing modification, alteration or destruction of heritage sites (whether archaeological, cultural or otherwise). The absence of rules in the Regional Coastal Plan, for example, means that historic heritage is not specifically considered separately from any other type of structure in the coastal marine area. An example of this is for the current rule that permits the removal of unsafe/unwanted structures in the coastal marine area which could apply to structures that have heritage merit as it would for any other structure. The Regional Coastal Plan does however include policy and assessment criteria which is applied in considering applications for resource consents. Where an application is considered to cause modification, alteration or destruction to a site that is considered to be of historic importance, the consent is a discretionary activity (the default in the RMA for coastal activities where regional rules are silent). It can be said therefore that the Regional Coastal Plan relies on the consent process to manage impacts on heritage/cultural sites.

The Regional Water and Soil Plan is also silent on historic heritage. In the beds of lakes and rivers, historic heritage is only a consideration if a consent is triggered and only as a matter of assessment. It does not form the basis of a condition of any of the permitted rules for activities such as sand and gravel extraction or disturbance or diversion of stream beds.

Partly due to the absence of provisions in regional plans, there has historically been limited data available on the efficiency and effectiveness of the current mechanisms used to protect our historic heritage. In terms of regional planning, the number of historic heritage sites/areas protected by rules and the number of consents relating to historic heritage, which are granted or refused, have not been actively reported. Other methods of protection (for example, ownership or covenants) are also not actively reported. The overall number is unlikely to be that great however due to the fact that there is less intact heritage present in water (historic heritage in the water is generally less well identified and is more vulnerable due to harsh conditions (for example, coastal erosion, sea level rise, and weather/storm damage) along with the lack of private ownership of sites in water.

The New Zealand Coastal Policy Statement 2010 (coastal policy statement), and in particular Policy 17, reinforces the requirements of Section 6 RMA and directs regional (and district) councils to protect historic heritage through its identification and assessment. Direction is also provided on facilitating integrated management (where for example historic heritage traverses mean high water springs) along with protection methods to be included in regional and district plans.

The Regional Policy Statement includes criteria to assist councils to identify historic heritage (giving effect to coastal policy statement Policy 17). Methods in the Regional Policy Statement give direction to apply this policy through the mapping or scheduling of historic heritage where it meets the criteria. A general direction is included to avoid significant adverse effects on historic heritage. The proposed policy statement directs district councils to manage historic heritage on land and the regional council to manage assets within the coastal marine area and in the beds of lakes and rivers.

The new Regional Plan therefore needs to include:

- Identification of historic heritage in water (particularly the coastal marine area but also beds of lakes and rivers). The council is undertaking mapping of historic heritage in water bodies, which could be included in plan mapping.
- Policy and a rules base that increase the likelihood that historic heritage is adequately protected but also to retain flexibility for sympathetic minor alterations.

Northland's heritage overview

It is widely known that Northland has a particularly rich historic heritage, given early Māori settlement and that it was also effectively 'the cradle' of early European settlement in New Zealand. Northland's historic heritage is of national significance both as a whole and in relation to particular sites, such as Cape Rēinga, the Waitangi Treaty grounds, the Stone Store and Ruapekapeka Pa to name a few. Many of these sites are on the NZ Heritage List and are in district plan schedules. There are several notable examples of sites on the NZ Heritage List that are in the coastal marine area (for instance the Mangonui Four Square and the Opua General Store). The settings of historic heritage sites are also important as they provide context. Particular examples of where the water in the coast is integral to the setting of land-based historic heritage includes Kerikeri Historic Basin and Rangipoua Historic reserve, which are both listed NZ Heritage areas.

The New Zealand Archaeological Association maintains a database of recorded archaeological sites. There are some 11,500 recorded archaeological sites in Northland, over 92% (10,530 sites) of which relate to Maori occupation. There is a much greater density of recorded sites in coastal areas. Many of these are on land although there appear to be a small number in the coastal marine area and in rivers and lakes. Some of these are listed, most are not and not all are subject to the statutory provisions of the Heritage NZ Act.

Feedback on the Draft Regional Plan

Four submissions were received specifically on the policy aspect of the historic heritage package. One concern raised was duplication with the Heritage New Zealand Pouhere Taonga Act 2014. Staff have worked with Heritage NZ on this section of the Proposed Regional Plan to help ensure there is not unnecessary duplication. Feedback has also been received on the restrictive list of sites that were included in the draft. Since then a greater range of sites have had their significance assessed and thus been included in the proposed plan.

9.3.4 Management options

This section summarises the management options for protecting historic heritage, which includes sites and wider areas (the areas are solely located in the coastal marine area). The intention is not to identify every different combination of approach as there would be many, but to represent the range of options and highlight key differences in approaches.

The options focus on regulatory mechanisms to protect historic heritage. The key differences illustrated between the options are the level of control exercised by council on modification, removal or destruction of historic heritage from permissive (essentially very few controls) to extremely restrictive, making modification and removal of historic heritage a prohibited activity.

Key terms/definitions

Regional Coastal Plan for Northland (RCP) - controls activities and structures in Northland's coastal marine area

Regional Water and Soil Plan for Northland (RWSP) - controls activities and structures on land and beds of lakes and river bodies

Option A: modified status quo

Overview: this option would essentially roll-over the status quo by having no specific rules to protect historic heritage. It would be largely policy driven.

Background: modified status quo – the Regional Policy Statement only requires rules to protect historic heritage 'where necessary'. This option would use a 'policy only approach'. The policy would apply to discretionary and non-complying activities where a consent requirement is triggered. A policy to 'avoid significant effects' would apply as this is set by the policy statement.

Option detail: repair/maintenance	Option detail: alteration	Option detail: new structures (historic heritage areas only)	Option detail: removal, replacement, relocation, destruction	Key policy approach
Repair and maintenance of structures is currently permitted in the RCP and RWSP. There are however no specific rules on repair/maintenance of historic heritage structures. Under this option, this will continue to be the case.	Both the RCP and RWSP have no specific rules on alterations to historic heritage structures. In the coastal marine area, the default for material alteration, modification (that is, altering the shape and size of a structure) is a discretionary activity, which would also apply to a structure with heritage value. In the beds of lakes and rivers alteration is generally permitted subject to standard conditions. Under this option, this scenario will continue to be the case.	There are no current rules in the regional plans as historic heritage areas do not exist. Under this option the default would be that although historic heritage areas would be mapped, new structures are a discretionary activity (under Section 12 RMA).	In the RCP, the removal (including where this is for relocation) or destruction of a heritage structure in its entirety is potentially permitted (under a catch-all rule) in the coastal marine area - if considered to be an unwanted or derelict structure. Removal of many unwanted structures is generally permitted in the RWSP. Under this option, this scenario will continue to be the case.	Policy would require the avoidance of significant effects.

Option B: moderate protection

Overview: a variation on the current approach where we include rules that specifically provide for historic heritage. The rules set are slightly more restrictive than the modified status quo.

Background: this option is slightly weaker than the approach recommended by Heritage NZ in their 'Model Rules for RMA Regional and District Plans (historic buildings)'. The main difference is that it is harder to remove a historic heritage structure on the basis that it is no longer being used. Alteration in freshwater environments would also be subject to the consent process if the structure is of historic heritage importance.

Option detail: repair/maintenance	Option detail: alteration	Option detail: new structures (historic heritage areas only)	Option detail: removal, relocation, replacement, destruction	Key policy approach
Repair/maintenance of heritage structures is permitted providing the material and techniques used are sympathetic to the existing structure.	All physical alterations as well as repair/maintenance that is not sympathetic to historic heritage is a discretionary activity.	Any new structure in a historic heritage area is a discretionary activity.	Any removal, replacement, relocation or destruction to historic heritage is a discretionary activity (includes relocation or demolition of parts of, or the entirety of the site).	Avoid significant effects.

Option C: stronger protection

Overview: a variation on the current approach where we specifically provide for protection of historic heritage. A tightening of the rules however mean that significant changes to historic heritage are a non-complying activity.

Background: approach is generally consistent with that recommended by Heritage NZ in their 'Model Rules for RMA Regional and District Plans (historic buildings)'. The focus is on protection but not at any cost. The non-complying activity status allows activities to be considered against tight policy criteria. This is somewhat stronger than Bay of Plenty and Greater Wellington Region Council

Option detail: repair/maintenance	Option detail: alteration	Option detail: new structures (historic heritage areas only)	Option detail: removal, relocation, replacement, destruction	Key policy approach
Repair/maintenance of heritage structures is permitted providing the material and techniques used are sympathetic to the existing structure.	All physical alterations as well as repair/maintenance that is not sympathetic to historic heritage is a discretionary activity.	Any new structure in a historic heritage area is a non-complying activity.	Removal, relocation, replacement or destruction of parts of, or the entirety of the site is a non-complying activity.	Strong policy provides guidance on when heritage assessments should be required. Strong policy provides guidance on when demolition/ relocation might be appropriate.

Option D: maximum protection

Overview: hard-nosed approach with heavy use of a prohibited activity status to prevent removal, replacement, damage or destruction of historic heritage.

Background: this approach is stronger than that advocated by Heritage NZ in their 'Model Rules for RMA Regional and District Plans (historic buildings). It promotes preservation of historic heritage in-situ at all costs.

Option detail: repair/maintenance	Option detail: alteration	Option detail: new structures (historic heritage areas only)	Option detail: removal, relocation, replacement, destruction	Key policy approach
Repair/maintenance of heritage structures is a controlled activity providing the material and techniques used are sympathetic to the existing structure.	All physical alterations as well as repair/maintenance that is not sympathetic to historic heritage is a non-complying activity.	Any new structure in a historic heritage area is a prohibited activity.	Removal, relocation, replacement or destruction of parts of, or the entirety of the site, is a prohibited activity.	Stronger than the approach set out in the policy statement, a policy could be set to avoid adverse effects.

9.3.5 High level objectives and measures

Section 32 requires an assessment of "*...the efficiency and effectiveness of the provisions in achieving the objectives...*". Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section Evaluation approach for more details.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. They signal a direction for where we want to head, without stating how far we go – that comes later (they are the beginnings of objectives).

Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against.

Historic heritage

The high level objectives included for historic heritage are:

- Minimise impacts on historic heritage in fresh and coastal waters.
- Minimise costs to resource users.
- Opportunity costs are minimised.

These objectives were chosen because they are the most directly relevant to the subject.

Objective	Measure
Minimise impacts on historic heritage in fresh and coastal waters.	1 = no level of control over alteration, replacement, destruction or removal of historic heritage. 2 = minor level of control over alteration, replacement, destruction or removal of historic heritage. 3 = moderate level of control over alteration, replacement, destruction or removal of historic heritage. 4 = significant level of control over alteration, replacement, destruction or removal of historic heritage. 5 = extreme level of control over alteration, replacement, destruction or removal of historic heritage.
Minimise costs toresource users.	Cost/need for a consents triggered by a rule relating to protection of historic heritage. The cost is an initial fixed fee. 1 = permitted or prohibited activity = $0. 2 = controlled (typically non-notified) = $839. 3 = discretionary or non-complying (typically limited or fully notified) = $3144. 4 = likely additional cost above fixed fee (for 3) to include a historic heritage assessment. The cost of this can vary depending on the scale of what is being proposed. Note: costs do not include those associated with preparing the application or hearing costs.
Opportunity costs are minimised.	This is a measure of the opportunity costs that could occur as a result of restrictions. It is a constructed measure on how benefits of development are considered when compared to adverse impacts on historic heritage. 1 = no ability to alter, replace or remove heritage feature – extreme opportunity cost. 2 = opportunity to apply to alter, replace or remove heritage feature, but significant weight given to protecting historic heritage – significant opportunity cost.

Objective	Measure
	3 = opportunity to apply to alter, replace or remove heritage feature, with moderate weight given to protecting historic heritage – moderate opportunity cost. 4 = opportunity to apply to alter, replace or remove heritage feature, with minor weight given to protecting historic heritage – minor opportunity cost. 5 = no constraint to alter, replace or remove heritage feature - no opportunity cost.

Section 32 requires an assessment of the impacts on economic growth and employment opportunities (s32(2)(a)). However, the impact of the options on these is imperceivable and/or can't be determined with any confidence. Therefore economic growth and employment opportunities have not been included as high level objectives. For more information go to the section '1.7 'Assessing impacts on economic growth and employment opportunities'' (in the introduction of this s32).

Explanation for the high level objectives and measures

Minimise impacts on historic heritage in fresh and coastal waters

This objective seeks to minimise the exposure of historic heritage to adverse effects. The objective gives effect to direction in the RMA (Section 6f), the coastal policy statement (Policy 17) and the Regional Policy Statement for Northland (Policy 4.5.3). The measure recognises the trade-offs that can occur in meeting this objective - running the spectrum between having no control (1) to (5), a very restrictive 'avoid adverse effects' approach. When considering this spectrum, it is important to note that even in the absence of regional plan rules to manage adverse effects on historic heritage, Section 12 (RMA) still applies, in respect of activities in the coastal marine area. This means in the absence of regional plan rules, the default activity status is a discretionary activity. In reality, having no specific rules on heritage will mean historic heritage structures will be treated the same as other structures under our Regional Plan rules and therefore consent may be required to undertake alterations and other works (unless the scope of alterations and other works are permitted). Many structures can be removed as of right as a permitted activity, which is unlikely to be desirable for structures identified as having heritage value.

It is important to recognise that other legislative provisions will still apply no matter what our rules say. For example, the Heritage Act 2014 requires an archaeological authority be sought from Heritage NZ for the damage and disturbance of archaeological resources dating prior to 1900. With this in mind, it is unlikely that any option will score very low in terms of protection although heritage that postdates 1900 will be at greater risk.

The information source for this measure has been staff judgement.

Minimise costs to resource users

This objective recognises there is a cost associated with regulation in terms of 'getting the development over the line'. The objective is to minimise the cost associated with regulation, that is, complying with the requirements of our rules. This cost falls on resource users, which might include both owners of historic heritage or developers who seek to use the space occupied by historic heritage. This might come in the form of having to go through the expense of getting a resource consent where none was required previously, to having to commission a historic heritage assessment (the costs of which are proportional to the size and scale of the project). The latter is more likely with a discretionary or non-complying activity.

The information source for this measure is the information the regional council has on regional consents received, including level of information required and overall cost of consent (this includes the initial fee and specialist reports that may be required).

Opportunity costs are minimised

Another cost is the opportunity cost, that is, the cost of losing the next best option when compared to the preferred option. The measure reflects this by recognising that the more restrictions you place on a development, the less likely it is that the benefits of that development will be fully realised. An extreme example might be where our rules prohibit the removal or demolition of historic heritage entirely, which removes the opportunity to use the space taken up by the historic heritage.

A more moderate example may be rules that restrict alterations that change the use of the building or structure (for example, from a storage shed into residential accommodation). The opportunity cost is needing to preserve the original fabric of the building against the ability to adapt the building to a use that might prolong its relevance.

The information source for this measure is largely staff judgement.

Objectives that were discounted

An objective to 'enhance historic heritage using non-regulatory methods' was discounted because we are not considering the use of non-regulatory methods. Under the RMA, rules by themselves cannot require the enhancement of historic heritage.

Note on council costs – these were excluded from consideration as council costs will be largely recoverable (therefore cost neutral) through the resource consent process.

9.3.6 Evaluating the management options

High level objective and measure	Option A: modified status quo	Option B: moderate protection	Option C: stronger protection	Option D: maximum protection
Minimise impacts on significant historic heritage in fresh and coastal waters. *Measure:* 1 = no level of control over alteration, replacement, destruction or removal of historic heritage. 2 = minor level of control over alteration, replacement, destruction or removal of historic heritage. 3 = moderate level of control over alteration, replacement, destruction or removal of historic heritage. 4 = significant level of control over alteration, replacement, destruction or removal of historic heritage. 5 = extreme level of control over alteration, replacement, destruction or removal of historic heritage.	2 = minor level of control over alteration, replacement, destruction or removal of historic heritage.	3 = moderate level of control over alteration, replacement, destruction or removal of historic heritage.	4 = significant level of control over alteration, replacement, destruction or removal of historic heritage.	5 = extreme level of control over alteration, replacement, destruction or removal of historic heritage.
Minimise costs to resource users. *Measure:*	Repair/maintenance 1 = permitted activity = $0.	Repair/maintenance 1 = permitted activity = $0.	Repair/maintenance 1 = permitted activity = $0. Alteration 3 = discretionary or non-complying	Repair/maintenance, 2 = Controlled (typically non-notified) = $839. Alteration 3 = discretionary or non-complying (typically limited or fully notified) = $3144.

High level objective and measure	Option A: modified status quo	Option B: moderate protection	Option C: stronger protection	Option D: maximum protection
1 = permitted or prohibited activity = $0. 2 = controlled (typically non-notified) = $839. 3 = discretionary or non-complying (typically limited or fully notified) = $3144. 4 = likely additional cost above fixed fee (for 3) to include an historic heritage assessment. The cost of this can vary depending on the scale of what is being proposed.	Alteration, replacement, new structures 3 = discretionary or non-complying (typically limited or fully notified) = $3144. Removal, damage, destruction, 1 = permitted activity = $0.	Alteration 3 = discretionary or non-complying (typically limited or fully notified) = $3144. Removal, replacement, damage, destruction, new structures (historic heritage areas), 3 = discretionary or non-complying (typically limited or fully notified) = $3144.	(typically limited or fully notified) = $3144. Removal, replacement, damage, destruction, new structures (historic heritage areas). 4 = likely additional cost above fixed fee (for 3) to include a historic heritage assessment. The cost of this can vary depending on the scale of what is being proposed.	Removal, replacement, damage, destruction, new structures (historic heritage areas), 1 = prohibited activity = $0.
Opportunity costs are minimised. *Measure:* 1 = no ability to alter, replace or remove heritage feature - extreme opportunity cost. 2 = opportunity to apply to alter, replace or remove heritage feature, but significant weight given to protecting historic heritage –significant opportunity cost. 3 = opportunity to apply to alter, replace or remove heritage feature, with moderate weight given to protecting historic heritage – moderate opportunity cost. 4 = opportunity to apply to alter, replace or remove heritage feature, with minor weight given to protecting historic heritage – minor opportunity cost. 5 = no constraint to alter, replace or remove heritage feature – no opportunity cost.	4 = opportunity to apply to alter, replace or remove heritage feature, with minor weight given to protecting historic heritage – minor opportunity cost.	3 = opportunity to apply to alter, replace or remove heritage feature, with moderate weight given to protecting historic heritage – moderate opportunity cost.	2 = opportunity to apply to alter, replace or remove heritage feature, but significant weight given to protecting historic heritage – significant opportunity cost.	1 = no ability to replace or remove heritage feature or put new structures in historic heritage areas – extreme opportunity cost (alteration is still possible as a non-complying activity and therefore = 3).

Certainty about the evaluation

There is always uncertainty about the potential impacts of management options.

The objectives and measures that we're most confident about the accuracy of are modified status quo (Option A) and maximum protection (Option D). The modified status quo is easier to evaluate because it is based on the approach to date. It is also relatively easy to assess the use of prohibited activity status in the maximum protection scenario as it is an extreme example.

The objectives and measures that we're least confident about the accuracy of are 'moderate' and 'stronger' protection (Options B and C) as these are 'middle of the road' options which are harder to evaluate.

We are however confident that the evaluation is accurate enough to make a decision on the preferred option. We don't think it would be viable and/or worthwhile to get more information to increase the accuracy of our evaluation as it's unlikely to change the relative differences between the options.

Time-frame of the evaluation

The evaluation is made over the life-time of the plan (10-15 years).

The preferred management option

The preferred option is Option C 'stronger protection'. This should result in more protection for historic heritage – the assets will be clearly identified in regional plan maps and there are rules and policy in place to protect them. The use of non-complying activity status rather than the current permitted activity status for removing historic heritage (the activity is currently permitted because historic heritage is essentially treated as any other structure) will mean applicants have to prove why this is the best option. The cost will be higher, for example, a consent will be needed and there may have to be a historic heritage assessment undertaken (although the identification of heritage will include a clear articulation of the values of each site). Opportunity costs may also be higher – there may be additional restrictions placed on development proposals that might otherwise be able to proceed in the absence of stricter rules.

Although this option scores highly for the first objective, it scores less highly for the second and third objectives. More weighting has been applied to the first objective due to the protection of historic heritage being a matter of national importance under Section 6 RMA.

The following options have been discounted:

Modified status quo – the absence of any specific rules would mean that there is a reliance on mapping and policy as the primary driver to protect historic heritage in plans. Rules, for example, around structures in the coastal marine area, would treat historic and non-historic heritage the same. This is likely to result in a lack of consideration of the heritage value of a structure. For example, current rules permit the removal of derelict structures in the coastal marine area. If the structure has historic heritage values, removal is still permitted without considering alternatives. As stated above under 'risks of not acting', it has to be remembered however that there is a degree of protection through other Acts as archaeological sites that pre-date 1900 receive statutory protection under the Heritage New Zealand Pouhere Taonga Act 2014. Further, Heritage NZ also seeks to be consulted on any proposal affecting building on its list (although the presence of a building or structure on the list does not confirm automatic protection – this is the role of plan scheduling).

Moderate protection would make it harder than the modified status quo to remove, replace or demolish historic heritage structures that are mapped in the regional plan. However, the use of discretionary activity status means less weight is given to plan policy than a non-complying activity, where a development proposal must be consistent with plan policy. This does lead to better opportunity costs as more weight is given to the merits of the development proposal but, as stated above, the objective to protect historic heritage has been given the most weighting.

Maximum protection would protect historic heritage from any removal, replacement, relocation or demolition. In some cases however, removal and relocation may be preferable to leaving the site in-situ (for example, because the structure is being eroded by the sea, it is creating a navigational hazard or the setting of the site needs to be modified to accommodate regionally significant infrastructure) however this option forecloses any opportunity to remove and relocate. Overall, it is considered that a prohibited activity status would be too restrictive.

9.4 Outstanding and significant natural areas

9.4.1 Executive summary

This section evaluates the options for managing significant natural heritage in the new Regional Plan. The relevant Regional Plan provisions are:

The relevant provisions are:

- Rule C.1.1.19 Hard protection structures in areas with significant values - non complying activity
- Rule C.1.1.20, Removal, demolition or replacement of a historic heritage site or part of a historic heritage site - non complying activity
- Rule C.1.2.11. Moorings in significant areas - non complying activity
- Rule C.1.1.22 Structures within areas of significant value - non complying activity
- Rule C.1.3.9 Extensions to existing aquaculture in areas with significant values - discretionary activity
- Rule C.1.3.10 Marae-based aquaculture in areas with significant values - discretionary activity
- Rule C.1.3.12 Small scale and short duration aquaculture in areas with significant values - non complying activity
- Rule C.1.3.14 New aquaculture in areas with significant values - prohibited activity
- Rule C.1.5.14 Other dredging, disturbance and disposal activities - non complying activity
- Rule C.1.6.5 New reclamations in areas of significant value - non complying activity
- Rule C.1.8.1 (10, 23), Coastal Works General Conditions
- Rule C.2.1.15 Structures in a significant area - non complying activity
- Rule C.2.1.16 Removal, demolition or replacement of a historic heritage site or part of a historic heritage site - non complying activity.
- Rule C.2.1.17 New flood defence in areas of significant value - non complying activity
- Rule C.2.3 (27) General conditions activities in the beds of lakes and rivers and in wetlands.
- Rule C.3.9 Damming or diversion of water in a significant indigenous wetland or significant area - non complying activity
- Policy D.2.7 Managing adverse effects on indigenous biodiversity.

This section focuses on assessing different options to protect:

- Outstanding and high natural character (mapped as being in coastal and in freshwater areas in the coastal environment); -
- Outstanding natural features (mapped as being in the coastal and in freshwater areas);
- Significant indigenous biodiversity (mapped as being in the coastal marine area).

It is confined to only assessing options to protect the above areas in water bodies. It does not address protection of these areas on land as this is primarily a function of district councils. As such, Outstanding Natural Landscapes (being on land) are not addressed in this chapter however effects on these areas from adjacent water-based activities would be assessed as part of the consenting process for either a discretionary or non-complying activity.

This topic is largely driven by requirements of the New Zealand Coastal Policy Statement 2010 (coastal policy statement) and the provisions of the Regional Policy Statement for Northland (policy statement).

The coastal policy statement reinforces the duties in Section 6 RMA and goes further by requiring that adverse effects on outstanding natural features and landscapes (Policy 15), and outstanding natural character areas (Policy 13) in the coastal environment, are to be avoided. It also provides criteria to be used to identify (map) such areas and requires regional policy

statements and plans to identify where this protection is needed. The effect of the recent *King Salmon* decision means that the plain meaning of 'avoid' is to be read as just that - all effects must be avoided. If this cannot occur then it is inferred from this decision that the activity is inappropriate.

As for outstanding natural features and outstanding natural character, the coastal policy statement (Policy 11a) goes further than the RMA with respect to indigenous biodiversity by requiring the avoidance of adverse effects on specific attributes of significant indigenous biodiversity in the coastal environment. These attributes are listed in the coastal policy statement and include threatened or at risk species and/or habitats. The identification of such areas will, in light of the King Salmon decision, set a very high bar for effects to be avoided.

The five options considered were:

- Option A – modified status quo.
- Option B – light touch.
- Option C – moderate protection.
- Option D – stronger protection.
- Option E – maximum protection.

The preferred option is the 'moderate protection' option. This is a comparatively 'middle of the road' interpretation of the coastal policy statement, with value-specific policy and rules tailored to overlays that enable appropriate activities. Most larger-scale activities would be a non-complying activity. Non-complying activity status exercises a reasonably strong degree of control over activities while retaining some flexibility to interpret legislation. The use of discretionary activity status for structures in significant ecological areas rather than non-complying status recognises the larger and varying extent of these mapped areas and the habitats they encompass (some habitats may be highly sensitive to certain structures, others less so). Significant ecological area habitat also tends to be more sensitive to activities like dredging, disturbance (i.e. vehicles on beaches) and reclamations rather than placement of structures..

The option is laid out in the table below:

Approach to mapping	New structures	Large-scale disturbance	Other activities	Key policy approach
Layers would be displayed separately on planning maps (no one single zone).	Coastal: significant ecological areas = discretionary. outstanding natural character, outstanding natural features = non-complying. Freshwater: outstanding natural features = non-complying.	Coastal: non-complying for all areas. Freshwater: outstanding natural features = non-complying.	Permitted-discretionary	Avoid adverse effects in coastal environment. Avoid significant adverse effects outside coastal environment.

For all options, with the exception of 'maximum protection', it is expected that an assessment of the effects of an activity in the coastal area, which is a discretionary or non-complying activity against any mapped values, will need to take place. This will be needed to satisfy the 'avoid adverse effects' regime of the coastal policy statement.

We are most confident about the accuracy of the modified status quo (Option A) and maximum protection (Option E). The modified status quo is easier to evaluate because it is based on the approach to date. It is also relatively easy to assess the use of prohibited activity status in the maximum protection scenario as it is an extreme example.

The options that we're least confident about the accuracy of are 'light', 'moderate' and 'stronger' protection (Options B, C and D) as these are 'middle of the road' options which are harder to evaluate.

In summary the 'moderate protection' option is the preferred option and this is because:

- the use of a discretionary activity status (for structures in significant ecological areas) and non-complying activity status (for structures in outstanding natural character and outstanding natural features and disturbance in outstanding natural character, outstanding natural features and significant ecological areas) gives flexibility to decision-makers to interpret policy and the potential effects of any consent application on the characteristics and values of each specific area. Under the RMA, decision makers must 'have regard' to policy requiring the avoidance of adverse effects but this is not the same as prohibition.
- that despite this, strong protection policy (both national and regional) means there must be a low tolerance for adverse effects and any decision allowing adverse effects (except those effects that are minor or transitory in nature) are likely to be challenged through the appeals process.
- additionally a high opportunity cost is present for this option - some potential development opportunities are likely to be constrained and therefore Northland may lose the economic benefits that this development would have provided. This is considered to be unavoidable given national direction to 'avoid adverse effects'.
- for activities proposing to take place in mapped outstanding natural features in freshwater, consent costs are higher under this option (than the modified status quo) due to the imposition of new rules requiring a resource consent.

The following options have been discounted:

Modified status quo – this option effectively protects significant values in the coastal marine area although does not distinguish between the values individually. It would have high opportunity costs in the coastal area as development would be either non-complying or prohibited. As a non-complying activity, the activity would have to be consistent with plan policy requiring that adverse effects be avoided. For freshwater values, there would be a moderate level of control on activities in outstanding natural features or outstanding natural landscapes as, although both would be mapped under this option, there would be no rules to specifically protect them for their own sake (this does not mean that activities will be automatically be permitted as other rules in the regional plan on the disturbance of the beds of lakes and rivers will still apply). Policy in the policy statement would still apply to require the 'avoidance of significant effects' however and this requirement would be considered by decision-makers at the resource consent stage.

Light touch – this option has a moderate level of control. It allows greater use of discretionary activity status. The discretionary activity status gives the possibility that development may go ahead as it gives more discretion to decision-makers at the consent stage on whether to 'allow' adverse effects (thus lower opportunity costs). Council control is 'moderate' overall however because any decision can be appealed and a decision made under a rule that is a discretionary activity can be overturned more easily than a rule set as a non-complying activity. Considerations of protection policy in the coastal policy statement would still apply to discretionary activities and therefore must be 'had regard to' by decision-makers. It is quite likely this option would be subject to multiple appeals as a liberal interpretation of protection under the NZCPS.

'Stricter' approach – activities would generally be at least non-complying or prohibited and therefore opportunity costs would still be very high with a much smaller window of discretion for non-complying activities and none at all for prohibited activities. For freshwater values, both resource consent costs and opportunity costs would be higher than the preferred option due to the imposition of rules with a new requirement for a resource consent. For this reason, the moderate protection option is preferred over this option because adequate protection can be achieved with recourse to a prohibited activity status.

Maximum protection – would have comparatively few consent costs as activities would be prohibited but very high opportunity costs as development cannot proceed in any way. It would be an effective tool to protect significant values in fresh and coastal waters.

9.4.2 Relevant provisions

This evaluation supports the following Regional Plan provisions:

- Rule C.1.1.19 Hard protection structures in areas with significant values - non complying activity
- Rule C.1.1.20, Removal, demolition or replacement of a historic heritage site or part of a historic heritage site - non complying activity

- Rule C.1.2.11. Moorings in significant areas - non complying activity
- Rule C.1.1.22 Structures within areas of significant value - non complying activity
- Rule C.1.3.9 Extensions to existing aquaculture in areas with significant values - discretionary activity
- Rule C.1.3.10 Marae-based aquaculture in areas with significant values - discretionary activity
- Rule C.1.3.12 Small scale and short duration aquaculture in areas with significant values - non complying activity
- Rule C.1.3.14 New aquaculture in areas with significant values - prohibited activity
- Rule C.1.5.14 Other dredging, disturbance and disposal activities - non complying activity
- Rule C.1.6.5 New reclamations in areas of significant value - non complying activity
- Rule C.1.8.1 (10, 23), Coastal Works General Conditions
- Rule C.2.1.15 Structures in a significant area - non complying activity
- Rule C.2.1.16 Removal, demolition or replacement of a historic heritage site or part of a historic heritage site - non complying activity.
- Rule C.2.1.17 New flood defence in areas of significant value - non complying activity
- Rule C.2.3 (27) General conditions activities in the beds of lakes and rivers and in wetlands.
- Rule C.3.9 Damming or diversion of water in a significant indigenous wetland or significant area - non complying activity
- Policy D.2.7 Managing adverse effects on indigenous biodiversity.

9.4.3 The problem, opportunity and/or requirement

This resource area includes those matters of national importance covered by Section 6 of the RMA that relate to 'natural values' and include the protection and preservation of:

- Outstanding and high natural character;
- Significant indigenous biodiversity; and
- Outstanding natural landscapes/features.

A shorthand for describing these areas is 'significant natural heritage'.

The focus is on fresh and coastal water, as it is considered that significant natural heritage on land fall primarily within the scope of district planning. The exception is significant indigenous biodiversity that falls within freshwater as this is largely addressed through the water quality work-stream and includes outstanding water bodies and wetlands.

Protection of coastal water values.

The current approach to managing significant natural heritage in the coastal marine area is through the use of Marine 1 (Protection) Management Zones. Currently, 7.9% of the coastal marine area falls within a Marine 1 Management Zone.

Since Marine 1 Management Zones were identified in the mid-1990's, it has become apparent that the use of a broad-brush 'catch-all' zone has been problematic. This is because:

- Typically, the values identified in each Marine 1 Management Zone are fairly generic and repetitive with little detail. A number of Marine 1 Management Zones are also just reflective of existing ecological protection (for example, overlaying marine reserves created by the Marine Reserves Act 1971). In these instances, it is difficult to determine whether other values have been assessed rigorously.

- The rules for Marine 1 Management Zones are particularly strict (for example, a number of activities are prohibited) and large areas are subject to a blanket presumption against development. Where an assessment of effects is required as part of a resource consent application, extra cost may be incurred as the assessment will need to consider effects on all the values within the Marine 1 Management Zones. This is not helped by the fact that values are not well defined or explained within the areas.

- No Marine 1 Management Zone has been identified exclusively on the grounds of natural features/landscapes or natural character values – the primary values identified are ecological. These other values are only considered in consenting through policy (as opposed to being mapped and subject to activity-specific rules).

A big change has been the advent of the New Zealand Coastal Policy Statement 2010 (coastal policy statement). This has brought in a new suite of requirements relating to the identification and protection of natural character, outstanding landscapes and features, and indigenous biodiversity.

The coastal policy statement requirements in more detail include:

- A requirement to map or otherwise identify outstanding natural landscapes and features (Policy 15) in the coastal environment as well as 'outstanding' natural character and 'high' natural character (Policy 13). The direction in the coastal policy statement is that this be undertaken in regional policy statements and plans. The Regional Policy Statement for Northland (regional policy statement) includes mapping layers undertaken at a regional scale of outstanding and high natural character (natural character is restricted to the coastal environment only) as well as outstanding natural landscape and outstanding natural features within and outside the coastal environment. Method 4.5.4(1) in the policy statement requires that the mapping undertaken through the policy statement be included in the relevant regional and district planning maps.

- A requirement to 'avoid adverse effects' on outstanding natural landscapes and features and outstanding' natural character (without the usual options available under the RMA of 'remedy' or 'mitigate') as well as 'avoid significant effects' on high natural character. This strong level of direction implies that we have to be clear about where the protection elements of the coastal policy statement apply and the particular values being protected. What adverse effects are acceptable, and not, is particularly important in the light of change in legal interpretation over how adverse effects can be avoided (Supreme Court 'King Salmon' decision').[2]

- A similar requirement to avoid adverse effects on the values/characteristics of significant indigenous biodiversity is also required by the coastal policy statement (Policy 11a). Criteria on what constitutes significant indigenous biodiversity has been added to the regional policy statement (Appendix 5). Although there is no explicit requirement to identify it in either the coastal policy statement or regional policy statement, the high level of protection afforded to this value again, strongly implies, we need to be clear about where this applies, something that can be achieved through mapping.

The regional policy statement added greater detail than the NZCPS on what 'avoid adverse effects' means in practise. Although it appears that 'avoid adverse effects' means exactly that according to the King Salmon judgement, some consensus has emerged from practitioners about what activities may avoid offending the principle set out in the King Salmon decision. Policy 4.6.1 of the regional policy statement for example recognises that minor or transitory adverse effects may not be an 'adverse effect'.

In a nutshell, the continued use of Marine 1 Management Zones is considered 'too blunt' given the requirement to identify different values and stronger direction afforded in the coastal policy statement and regional policy statement, including the requirement to 'avoid adverse effects'. The 10 year plan review findings suggested that the more information provided up-front and the clearer planning maps can be in indicating where 'avoid adverse effects' applies, the less cost and uncertainty there is likely to be for resource users. The plan review recommended that Marine 1 Management Zones be removed in favour of adopting the layers mapped in the regional policy statement with further mapping (for the regional plan) of:

- additional features that could qualify as outstanding natural features (including those in Appendix 4 of the regional policy statement). This assessment and mapping work was undertaken in 2016.
- significant indigenous biodiversity in marine areas.

The mapping of significant indigenous biodiversity in marine areas was undertaken in 2015/2016 and a number of areas were mapped, summarised as being:

Significant Ecological Areas (including Significant Toheroa Beaches).
Significant ecological areas include areas of habitat in both estuarine and in open coast areas. Examples of habitats in the open coast include rocky reefs and reef edge habitats which cover 202,000ha of the east coast (although not every rocky reef is a significant ecological area). Also important are discrete estuarine areas which function as feeding and breeding grounds for important bird and aquatic mammals and fish. The mapping in this case is designed to drive rules and policy with the aim of satisfying the protection requirements in the coastal policy statement.

Significant Bird Areas and Significant Marine Mammal and Seabird Areas.

2 *Environmental Defence Society Inc versus the New Zealand King Salmon Co Ltd.,2014. NZ Supreme Court 38.*

The values in these areas are more dispersed over large areas of coast and are therefore less susceptible to disruption by human activities. Marine mammals inhabit most of the coastal marine area for example. Seabirds are found up and down Northland's coastline making it difficult to isolate any particular area as important. In this case, the mapping functions as an information layer for resource consent effects assessment.

The table below highlights the area of the coastal marine area that is afforded protection through existing MM1 Protection Zones versus the mapping that was undertaken in the regional policy statement of outstanding/high natural character and outstanding natural features along with the additional mapping that has happened since, through the development of the new regional plan:

	Percentage	Hectares
Total area of coastal marine area	*100%*	*1,743,346*
Outstanding natural features in coastal marine area	0.08%	1,382
Outstanding natural character in coastal marine area	2.68%	47,150
Sigificant ecological areas	30.30%	532,213
Significant bird areas	9.98%	175,204
Significant marine mammal and seabird areas	100%	1,743,346
High natural character in coastal marine area	3.83%	67,238
Existing MM1 Protection Zone	*7.9%*	*137,909*

As can be seen, some of these layers amount to more than the current Marine 1 Management Zones - for example significant ecological areas. There are a number of overlaps between different layers however, with some areas of the coastal marine area having more than one value class (for example, outstanding natural character and significant ecological areas often overlap). Depending on the size, scale and overall vulnerability of the values of the above layers, a mix of different rules and policy will be need to meet the requirements of the regional policy statement and coastal policy statement.

Protection of freshwater values

The coastal policy statement does not apply to freshwater outside of the immediate coastal environment and the regional policy statement (which expands on the coastal policy statement) is silent on protection of natural character values in freshwater (as they have not been mapped - see below). The regional policy statement does however direct that outstanding natural landscapes and features away from the coast are protected from significant adverse effects.

In the current plan, no mapping has been undertaken of outstanding and high natural character or outstanding natural landscapes/features in freshwater. These values therefore default to being addressed on a case-by-case basis at the resource consent stage. The reality is that if they are not mapped, they may get overlooked.

The region-wide mapping undertaken as part of the regional policy statement included large tracts of inland areas as well as freshwater bodies. No natural character was mapped away from the coastal environment on the basis that doing so would be an expensive and complex task. It is also likely that rules to protect the riparian margins of rivers and lakes as well as control changes to their form will serve as a suitable proxy to protect natural character values.

Only a small percentage of freshwater has been mapped with an outstanding natural feature overlay. These features tend to be tightly drawn areas such as waterfalls, natural springs and dune or volcanically-derived lakes.

Outstanding natural landscapes cover large land areas where there are many water bodies likely to be present but in most cases the water body itself does not drive the designation of the area as an outstanding landscape or the effects of any activity in the water are likely to be marginal to the overall integrity of the landscape. It would be inappropriate to include these larger areas in the regional plan as most of the activities that would impact on them are under the control of district planning.

Feedback on the Draft Regional Plan

- 14 submissions were received on the policy for significant indigenous biodiversity. Many of these submitters felt a more flexible or clearer approach was needed with this policy, including more options giving the proponent of the activity the ability to avoid, remedy or mitigate adverse effects. There was also a desire for greater use of biodiversity offsetting and environmental compensation in consenting. Other submitters felt that the policy needs to recognise that short term effects can be damaging on fragile systems. The policy must also manage effects that are not necessarily significant but still damaging (more than minor).
- 8 submissions were received on policy for natural character. Again many of these submitters felt that a more flexible and clearer approach was required with the ability to avoid, remedy or mitigate adverse effects. One submitter felt that the policy needs to better account for effects on natural character that is less than outstanding.
- 8 submissions were received on policy for outstanding natural features. Similar to the above, there was a desire, particularly among infrastructure providers to allow more flexibility to avoid, remedy or mitigate adverse effects. One submitter felt that the policy needs to better account for effects on natural features that are less than outstanding.

9.4.4 Management options

This section summarises the management options for significant natural heritage. The intention is not to identify every different combination of approach as there would be many, but to represent the range of options and highlight key differences in approaches.

The options focus on the protection of natural heritage in the marine and freshwater environment from the adverse effects of use and development. The key differences illustrated between the options are the level of control exercised by council on, in particular, construction or modification to structures and disturbance to areas that are mapped as significant.

All options assume that minor/transitory effects from activities would be allowed (permitted or controlled) as this is directed by the regional policy statement.

Option A: modified status quo

Overview: this option is not pure status quo as the extent of Marine Management 1 Zones would need to be updated to reflect the extent of any new mapping. However, a 'one size fits all' approach could be taken with newly identified significant natural heritage areas bundled into one single zone with a general 'one size fits all' policy. All existing rules would then be 'rolled over'. In freshwater environments, although the new maps would be included, no specific rules would be included (which is the case currently).

Background: this option could be considered to exercise a high degree of control in the coastal marine area as it rolls over existing Marine Management 1 Zone rules, which are relatively restrictive but a low degree of control in freshwater by not including specific rules.

Approach to mapping	New structures	Large scale disturbance	Other activities	Key policy approach
This would not be the pure status quo as Marine Management 1 Zones would need to be updated to reflect the extent of any new mapping. However, a 'one size fits all' approach could be taken with newly identified significant natural heritage areas bundled into one single zone.	Coastal = non-complying activity status (roll over of existing rules).	Coastal = non-complying activity (some prohibited activities).	Most other activities will be permitted - discretionary.	Generic policy: avoid adverse effects in coastal environment.

Approach to mapping	New structures	Large scale disturbance	Other activities	Key policy approach
This is a general 'rule of thumb' approach as the mapping, rules and policy will not take into account each underlying value and the likely effect of the activity on that specific value. With regard to freshwater values, maintaining the status quo would again not be a pure status quo as the mapping of outstanding natural features would be included. No rules would be incorporated however and thus the maps would drive policy (for example, when considering a resource consent).	Freshwater = no specific rules. Likely to be discretionary but may also be a permitted or controlled activity (policy-led where consent is required).	Freshwater = no specific rules. Likely to be a discretionary activity (policy-led where consent is required).		Avoid significant adverse effects outside coastal environment.

Option B: light touch

Overview: a comparatively 'light touch' interpretation of the coastal policy statement, with value specific policy tailored to overlays, enabling activities that are of an appropriate scale and that do not conflict with those identified values. Most larger-scale activities would be a discretionary activity.

*Background:*this option represents a minimal regulatory regime for significant natural areas. The use of a discretionary activity status rather than non-complying or prohibited activity status represents a significant departure from the current regulatory regime for the management of significant areas. It is not an approach used in other regions to give effect to the coastal policy statement.

Approach to mapping	New structures	Large scale disturbance	Other activities	Key policy approach
Layers would be displayed separately on planning maps (no one single zone).	Discretionary (coastal and freshwater).	Discretionary (coastal and freshwater).	Permitted or controlled.	Avoid adverse effects in coastal environment. Avoid significant adverse effects outside coastal environment.

Option C: moderate control

Overview: a comparatively 'middle of the road' interpretation of the coastal policy statement, with value-specific policy and rules tailored to overlays, enabling activities that are of an appropriate scale and that do not conflict with those identified values. Most larger-scale activities would be a non-complying activity.

*Background:*this option represents a moderate regulatory regime over significant natural areas. It is more aligned with the approach in other regions and the intent of the coastal policy statement to avoid adverse effects on significant values. Non-complying activity status exercises a reasonably strong degree of control over activities while retaining some flexibility to interpret legislation. The use of discretionary activity status for structures in ecological areas rather than non-complying status recognises the larger extent of these mapped areas compared with other mapped areas and that the placement of these structures is less likely to adversely effect the values and characteristics of significant ecological areas, compared with large scale disturbance activities.

Approach to mapping	New structures	Large scale disturbance	Other activities	Key policy approach
Layers would be displayed separately on planning maps (no one single zone).	Coastal: new structures in significant ecological areas = discretionary. New structures in outstanding natural character, outstanding natural features = non-complying. Freshwater: new structures in outstanding natural features = non-complying.	Coastal: large-scale disturbance in significant ecological areas = non-complying. Large-scale disturbance in outstanding natural character, outstanding natural features = non-complying. Freshwater: large-scale disturbance in outstanding natural features = non-complying.	Permitted - discretionary.	Avoid adverse effects in coastal environment. Avoid significant adverse effects outside coastal environment.

Option D: strict control

Overview: a strict interpretation of the coastal policy statement, with value-specific policy tailored to overlays, enabling activities that are of an appropriate scale and that do not conflict with those identified values.. Most larger-scale activities would be a non-complying activity or prohibited activity.

*Background:*this option represents a strict regulatory regime over significant natural areas. It is similar to Option A in terms of the strictness of rules (at least in the coastal areas) but is more nuanced in that mapping overlays would be displayed separately and thus value-specific policy will apply. It is stricter than Option A in the approach it takes to freshwater significant areas.

Approach to mapping	New structures	Large scale disturbance	Other activities	Key policy approach
Layers would be displayed separately on planning maps (no one single zone).	Coastal: new structures in significant ecological areas = non-complying. New structures in outstanding natural character, outstanding natural features = non-complying. Freshwater:	Coastal: Large-scale disturbance in significant ecological areas = prohibited. Large-scale disturbance in outstanding natural character, outstanding natural features = prohibited. Freshwater:	Permitted - discretionary.	Avoid adverse effects in coastal environment. Avoid significant adverse effects outside coastal environment.

Approach to mapping	New structures	Large scale disturbance	Other activities	Key policy approach
	new structures in outstanding natural features = non-complying.	large-scale disturbance in outstanding natural features = prohibited.		

Option E: maximum protection

Overview: a strict interpretation of the coastal policy statement. Most larger-scale activities would be prohibited.

Background: this option represents a strict regulatory regime for significant natural areas. It interprets the direction of the coastal policy statement to 'avoid adverse effects' as a direction to 'prohibit' new structures and large-scale disturbance. No regional council has adopted this approach in New Zealand.

Approach to mapping	New structures	Large scale disturbance	Other activities	Key policy approach
Layers would be displayed separately on planning maps (no one single zone).	Coastal: new structures in significant ecological areas = prohibited. New structures in outstanding natural character, outstanding natural features = prohibited. Freshwater: new structures in outstanding natural features = prohibited.	Coastal: large-scale disturbance in significant ecological areas = prohibited. Large-scale disturbance in outstanding natural character, outstanding natural features = prohibited. Freshwater: large-scale disturbance in outstanding natural features = prohibited.	Permitted - non-complying.	Avoid adverse effects in coastal environment. Avoid significant adverse effects outside coastal environment.

9.4.5 High level objectives and measures

Section 32 requires an assessment of "*...the efficiency and effectiveness of the provisions in achieving the objectives...*". Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section Evaluation approach for more details.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. They signal a direction for where we want to head, without stating how far we go – that comes later (they are the beginnings of objectives).

Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against.

Significant natural heritage

The high level objectives included for significant natural heritage are:

- Minimise impacts on significant natural heritage in fresh and coastal waters.

- Minimise costs resource users.
- Opportunity costs are minimised.

These objectives were chosen because they are the most directly relevant to the subject.

Objective	Measure
Minimise impacts on significant natural heritage in fresh and coastal waters.	1 = no level of control over structures, disturbance in significant natural heritage. 2 = minor level of control over structures, disturbance in significant natural heritage. 3 = moderate level of control over structures, disturbance in significant natural heritage. 4 = significant level of control over structures, disturbance in significant natural heritage. 5 = extreme level of control over structures, disturbance in significant natural heritage.
Minimise costs resource users.	Cost/need for a consent triggered by a rule relating to protection of significant natural heritage. The cost is an initial fixed fee. 1 = permitted or prohibited activity = $0. 2 = controlled (typically non-notified) = $839. 3 = discretionary or non-complying (typically limited or fully notified) = $3144. 4 = likely additional cost above fixed fee (for 3) to include an ecological, geological or landscape assessment. The cost of this can vary depending on the scale of what is being proposed. Note: costs do not include those associated with preparing the application or hearing costs.
Opportunity costs are minimised.	This is a measure of the opportunity costs that could occur as a result of restrictions. It is a constructed measure on how benefits of development are considered when compared to adverse impacts on significant natural heritage. 1 = no ability to put structures, undertake disturbance in significant natural heritage – extreme opportunity cost. 2 = opportunity to put structures, undertake disturbance in significant natural heritage but significant weight given to protecting significant natural heritage – significant opportunity cost. 3 = opportunity to put structures, undertake disturbance in significant natural heritage, with moderate weight given to protecting significant natural heritage – moderate opportunity cost. 4 = opportunity to put structures, undertake disturbance in significant natural heritage, with minor weight given to protecting significant natural heritage - minor opportunity cost. 5 = no constraint to put structures, undertake disturbance in significant natural heritage – no opportunity cost.

Section 32 requires an assessment of the impacts on economic growth and employment opportunities (s32(2)(a)). However, the impact of the options on these is imperceivable and/or cannot be determined with any confidence. Therefore economic growth and employment opportunities have not been included as high level objectives. For more information go to the section 1.7 'Assessing impacts on economic growth and employment opportunities' in the introduction section of this s32 report.

Explanation for the high level objectives and measures

Minimise impacts on significant natural heritage values

This objective seeks to meet our statutory obligations to protect significant natural heritage. The objective represents the combined direction of the RMA (Section 6), the coastal policy statement policy 11a, 13(1)a and 15(a), and the Regional Policy Statement for Northland (Policy 4.4.1, 4.6.1). The fact that it seeks to minimise impacts rather than avoid them altogether recognises the distinction between coastal and freshwater significant natural heritage (adverse effects in the coastal environment are to avoided under the coastal policy statement). It is also the case that consent processes are not bound to 'give effect' to avoid the requirement like plans are. It is plausible for consents to be granted that would result in adverse effects occurring (more likely to arise from a discretionary activity than a non-complying activity). The difference in approach between freshwater and coastal areas will be distinguished in the scoring under the 'evaluation' section of this report. (1.6 'Evaluation approach').

The measure for this objective recognises the trade-offs that can occur in meeting this objective running the spectrum between having no control (1) to (5) a very restrictive 'avoid adverse effects' approach. When considering this spectrum, it is important to note that even in the absence of regional plan rules to manage adverse effects on significant natural heritage, Section 12 (RMA) in respect to activities in the coastal marine area and Section 13 (1) in respect to structures in freshwater applies.. This means, in the absence of regional plan rules, under S87B (RMA) the default activity status is a discretionary activity (unless the activity is otherwise permitted or controlled). The bottom line is that it is unlikely any option will score (1) on this measure.

Information for this measure is purely based on staff judgement.

Minimise costs resource users

This objective recognises there is a cost with regulation in terms of 'getting the development over the line'. This might come in the form of having to go through the expense of getting consent in the first instance to extra assessments (for example, ecological, landscape, and cultural) or information requirements. Under the RMA however, most development taking place in the coastal marine area requires a consent (as a discretionary activity unless otherwise permitted, controlled or restricted discretionary through a plan rule) and therefore having no rules would activate the default of a discretionary activity for many activities. This is also true with respect to structures in freshwater under S13B.

Mapping can on the one hand add certainty – applicants and decision-makers can see clearly what values apply and draw a line between this and the effects of the development. Without mapping, a case-by-case assessment of effects on significant values at the resource consent stage might be necessary. Mapping also has the potential to add additional cost as it says quite clearly there is a need to avoid, remedy or mitigate effects on that identified value (as there is less room for manoeuvre to suggest values are not present). Remediation and mitigation often require additional cost to make the development acceptable, especially if the effects are significant. With freshwater significant natural heritage, remediation and mitigation is available although significant effects must still be avoided. In the coastal marine area, however, under the coastal policy statement the only option is to avoid all effects and therefore the major additional cost is likely to arise in the form of an opportunity cost.

Opportunity costs are minimised

The major cost is an opportunity cost and this objective reflects that. That is the cost of losing the next best option when compared to the preferred option. The measure (from 1 to 5) reflects this by recognising that the more restrictions you place on a development, the less likely it is that the benefits (usually economic and social) of that development will be fully realised. As stated above, the requirement to avoid adverse effects in the coastal marine area has the potential to curtail some development in mapped areas. In the coastal marine area, 32.8% or 572,394 hectares are mapped as being significant. Most mapped areas are estuarine, where the majority of development occurs. Some values in the open coast are unmapped as they are considered to be less at risk to development or it is too difficult to confidently identify values (in the case of natural character) however significant ecological areas have been mapped in the open coast. Development such as aquaculture, large structures and capital dredging, would find it hard to meet this test and in some cases the only option is for the activity not to proceed. This measure is a matter of judgement – we may never hear about many activities that would have proceeded to the consent stage had there otherwise been an easier path.

With freshwater significant natural heritage the opportunity cost is less of a factor as only significant effects must be avoided which is a lower test (unless the rules were to actively prohibit an activity).

Objectives that were discounted

An objective to 'enhance significant natural heritage using non-regulatory methods' was discounted because we are not considering the use of non-regulatory methods. Under the RMA, rules by themselves cannot require the enhancement of significant natural heritage.

Note on council costs – these were excluded from consideration as council costs will be largely recoverable (therefore cost neutral) through the resource consent process.

9.4.6 Evaluating the management options

High level objective and measure	Option A: modified status quo	Option B: light touch	Option C: moderate protection	Option D: stronger protection	Option E: maximum protection
Minimise impacts on significant natural heritage in fresh and coastal waters. *Measure:* 1 = no level of control over structures, disturbance in significant natural heritage. 2 = minor level of control over structures, disturbance in significant natural heritage. 3 = moderate level of control over structures, disturbance in significant natural heritage. 4 = significant level of control over structures, disturbance in significant natural heritage. 5 = extreme level of control over structures, disturbance in significant natural heritage.	Coastal: 4 = significant level of control over structures, disturbance in significant natural heritage. (Some prohibited activities which = 5.) Freshwater: 3 = moderate level of control over structures, disturbance in significant natural heritage.	Coastal: 3 = moderate level of control over structures, disturbance in significant natural heritage. Freshwater: 3= moderate level of control over structures, disturbance in significant natural heritage.	Coastal: 4 = significant level of control over structures, disturbance in significant natural heritage. 3 = moderate level of control over structures in significant ecological areas.) Freshwater: 3 = moderate level of control over structures, disturbance in significant natural heritage.	Coastal: 4 = significant level of control over structures, in significant natural heritage. 5 = extreme level of control over disturbance in significant natural heritage. Freshwater: 4 = significant level of control over structures, in significant natural heritage. 5 = extreme level of control over disturbance in significant natural heritage.	Coastal/freshwater: 5 = extreme level of control over structures, disturbance in significant natural heritage.
Minimise costs to resource users. *Measure:* Cost/need for a consent triggered by a rule relating to protection of significant natural heritage. The cost is an initial fixed fee. 1 = permitted or prohibited activity = $0.	Coastal: 4 = likely additional cost above fixed fee (for 3) to include an ecological, geological or landscape assessment. The cost of this can vary depending on the scale of what is being proposed (some prohibited activities which = 1).	Coastal: 4 = likely additional cost above fixed fee (for 3) to include an ecological, geological or landscape assessment. The cost of this can vary depending on the scale of what is being proposed.	Coastal: 4 = likely additional cost above fixed fee (for 3) to include an ecological, geological or landscape assessment. The cost of this can vary depending on the scale of what is being proposed.	Coastal: 4 = likely additional cost above fixed fee (for 3) to include an ecological, geological or landscape assessment. The cost of this can vary depending on the scale of what is being proposed.	Coastal/freshwater: 1 = prohibited activity = $0.

High level objective and measure	Option A: modified status quo	Option B: light touch	Option C: moderate protection	Option D: stronger protection	Option E: maximum protection
2 = controlled (typically non-notified) = $839. 3 = discretionary or non-complying (typically limited or fully notified) = $3144. 4 = likely additional cost above fixed fee (for 3) to include an ecological, geological or landscape assessment. The cost of this can vary depending on the scale of what is being proposed.	Freshwater: 3 = discretionary or non-complying (typically limited or fully notified) = $3144.	Freshwater: 3 = discretionary or non-complying (typically limited or fully notified) = $3144.	Freshwater: 4 = likely additional cost above fixed fee (for 3) to include an ecological, geological or landscape assessment. The cost of this can vary depending on the scale of what is being proposed.	Freshwater: 4 = likely additional cost above fixed fee (for 3) to include an ecological, geological or landscape assessment. The cost of this can vary depending on the scale of what is being proposed.	
Opportunity costs are minimised. *Measure:* 1 = no ability to put structures, undertake disturbance in significant natural heritage - extreme opportunity cost. 2 = opportunity to put structures, undertake disturbance in significant natural heritage but significant weight given to protecting significant natural heritage - significant opportunity cost. 3 = opportunity to put structures, undertake disturbance in significant natural heritage, with moderate weight given to protecting significant natural heritage - moderate opportunity cost. 4 = opportunity to put structures, undertake disturbance in significant natural heritage, with minor weight given to protecting significant natural heritage - minor opportunity cost.	Coastal: 2 = opportunity to place structures, undertake disturbance in significant natural heritage but significant weight given to protecting significant natural heritage - significant opportunity cost (some prohibited activities which = 1). Freshwater: 4 = opportunity to put structures, undertake disturbance in significant natural heritage, with minor weight given to protecting significant natural heritage - minor opportunity cost.	Coastal: 3 = opportunity to put structures, undertake disturbance in significant natural heritage, with moderate weight given to protecting significant natural heritage - moderate opportunity cost. Freshwater: 3 = opportunity to put structures, undertake disturbance in significant natural heritage, with moderate weight given to protecting significant natural heritage - moderate opportunity cost.	Coastal: 2 = opportunity to put structures, undertake disturbance in significant natural heritage but significant weight given to protecting significant natural heritage - significant opportunity cost 3 = opportunity to put structures, in significant ecological areas, with moderate weight given to protecting significant natural heritage - moderate opportunity cost). Freshwater: 3 = opportunity to put structures, undertake disturbance in significant natural heritage, with moderate weight given to protecting significant natural heritage - moderate opportunity cost.	Coastal: 2 = opportunity to put structures in significant natural heritage but significant weight given to protecting significant natural heritage - significant opportunity cost. 1 = no ability to undertake disturbance in significant natural heritage - extreme opportunity cost. Freshwater: 3 = opportunity to put structures in significant natural heritage, with moderate weight given to protecting significant natural heritage - moderate opportunity cost. 1 = no ability to undertake disturbance in significant natural heritage - extreme opportunity cost.	Coastal: 1 = no ability to place structures, undertake disturbance in significant natural heritage - extreme opportunity cost. Freshwater: 1 = no ability to place structures, undertake disturbance in significant natural heritage - extreme opportunity cost.

High level objective and measure	Option A: modified status quo	Option B: light touch	Option C: moderate protection	Option D: stronger protection	Option E: maximum protection
5 = no constraint to put structures, undertake disturbance in significant natural heritage - no opportunity cost.					

Certainty about the evaluation

There is always uncertainty about the potential impacts of management options.

We're confident that evaluation is accurate enough to make a decision on the preferred option. We don't think it would be viable and/or worthwhile to get more information to increase the accuracy of our evaluation as it's unlikely to change the relative differences between the options.

Time-frame of the evaluation

The evaluation is made over the life-time of the plan (10-15 years).

The preferred management option

For all options, with the exception of 'maximum protection', it is expected that an assessment of the effects of an activity in the coastal area, which is a discretionary or non-complying activity against any mapped values, will need to take place. This will be needed to satisfy the 'avoid adverse effects' regime of the coastal policy statement.

We are most confident about the accuracy of the modified status quo (Option A) and maximum protection (Option E). The modified status quo is easier to evaluate because it is based on the approach to date. It is also relatively easy to assess the use of prohibited activity status in the maximum protection scenario as it is an extreme example.

The options that we're least confident about the accuracy of are 'light', 'moderate' and 'stronger' protection (Options B, C and D) as these are 'middle of the road' options which are harder to evaluate.

In summary the 'moderate protection' option is the preferred option and this is because:

- the use of a discretionary activity status (for structures in significant ecological areas) and non-complying activity status (for structures in outstanding natural character and outstanding natural features and disturbance in outstanding natural character, outstanding natural features and significant ecological areas) gives flexibility to decision-makers to interpret policy and the potential effects of any consent application on the characteristics and values of each specific area. Under the RMA, decision makers must 'have regard' to policy requiring the avoidance of adverse effects but this is not the same as prohibition.
- that despite this, strong protection policy (both national and regional) means there must be a low tolerance for adverse effects and any decision allowing adverse effects (except those effects that are minor or transitory in nature) are likely to be challenged through the appeals process.
- additionally a high opportunity cost is present for this option - some potential development opportunities are likely to be constrained and therefore Northland may lose the economic benefits that this development would have provided. This is considered to be unavoidable given national direction to 'avoid adverse effects'.
- for activities proposing to take place in mapped outstanding natural features in freshwater, consent costs are higher under this option (than the modified status quo) due to the imposition of new rules requiring a resource consent.

The following options have been discounted:

Modified status quo – this option effectively protects significant values in the coastal marine area although does not distinguish between the values individually. It would have high opportunity costs in the coastal area as development would be either non-complying or prohibited. As a non-complying activity, the activity would have to be consistent with plan policy requiring that adverse effects be avoided. For freshwater values, there would be a moderate level of control on activities in outstanding natural features or outstanding natural landscapes as, although both would be mapped under this option, there would be

no rules to specifically protect them for their own sake (this does not mean that activities will be automatically be permitted as other rules in the regional plan on the disturbance of the beds of lakes and rivers will still apply). Policy in the policy statement would still apply to require the 'avoidance of significant effects' however and this requirement would be considered by decision-makers at the resource consent stage.

Light touch – this option has a moderate level of control. It allows greater use of discretionary activity status. The discretionary activity status gives the possibility that development may go ahead as it gives more discretion to decision-makers at the consent stage on whether to 'allow' adverse effects (thus lower opportunity costs). Council control is 'moderate' overall however because any decision can be appealed and a decision made under a rule that is a discretionary activity can be overturned more easily than a rule set as a non-complying activity. Considerations of protection policy in the coastal policy statement would still apply to discretionary activities and therefore must be 'had regard to' by decision-makers. It is quite likely this option would be subject to multiple appeals as a liberal interpretation of protection under the NZCPS.

'Stricter' approach – activities would generally be at least non-complying or prohibited and therefore opportunity costs would still be very high with a much smaller window of discretion for non-complying activities and none at all for prohibited activities. For freshwater values, both resource consent costs and opportunity costs would be higher than the preferred option due to the imposition of rules with a new requirement for a resource consent. For this reason, the moderate protection option is preferred over this option because adequate protection can be achieved with recourse to a prohibited activity status.

Maximum protection – would have comparatively few consent costs as activities would be prohibited but very high opportunity costs as development cannot proceed in any way. It would be an effective tool to protect significant values in fresh and coastal waters.

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10 Natural hazards

10.1 Executive summary

Under section 2 of the RMA, the term 'natural hazard' is defined as: *"Any atmospheric or earth or water related occurrence (including earthquake, tsunami, erosion, volcanic and geothermal activity, landslip, subsidence, sedimentation, wind, drought, fire or flooding) the action of which adversely affects or may adversely affect human life, property, or other aspects of the environment".*

The RMA provides a mandate for regional councils to manage natural hazards, climate change impacts and the effects of hazard mitigation measures on the environment. It is the primary statute driving the development of a regional plan and hazards provisions within the proposed regional plan. There are two main parts in the Act that address natural hazards and the resource management-related impacts associated with hazards management. Part 2 – purpose and principles, addresses the adverse impacts that the management of natural hazards can have on the environment and; Part 4 – functions, powers, and duties of central and local government that deals more directly with natural hazards.

The primary natural hazards the regional council is responsible for managing (the impacts of) are flooding and coastal hazards [(1)]. This evaluation report therefore provides an analysis of the appropriateness, costs and benefits of the various 'options' to mange natural hazard risk through the Proposed Regional Plan for Northland. It starts by outlining the statutory regulations that the council must give effect to for the management of natural hazards and the non-regulatory documents that are available to guide the development of provisions and decision-making. The report then identifies and assesses the suite of management options available for managing flood hazard risk and coastal hazard risk in Northland.

It should be noted that the Proposed Regional Plan does not contain a specific natural hazards rules section. This is because as outlined above, natural hazards are essentially natural occurrences that have the potential to adversely affect things – they are not an activity (such as wastewater discharges) regulated by sections 12, 13, 14 or 15 of the RMA in the strictest sense. What we have done therefore is divided the various natural hazard provisions into the relevant activity sections (such as coastal structures or activities in the beds of rivers). This section 32 evaluation report will direct readers to what section of the plan the relevant natural hazard rules can be found.

Flood hazard risk

Flooding provides the highest natural hazard risk to Northland because of the extensive existing development on floodplains and the region's exposure to high intensity rainfall events.

This report looks at activities that are impacted by, or impact on, flood hazard events. This includes:

- Earthworks in floodplains;
- Structures and activities in flood plains (including re-building of materially damaged buildings in high risk flood hazard areas) that divert flood flow;
- Excavation of river beds; and
- Flood protection and minor bank protection structures in river beds.

The report outlines that through new information (such as the Priority Rivers Flood Risk Reduction Project), the regional council now has produced detailed flood hazard maps for priority catchments in the region (available online at www.nrc.govt.nz/priorityrivers. These maps show the likely extent of river flooding during a 10-year or 100-year flood event. A 10-year flood area has a 10% chance of flooding annually, whilst the more extensive 100-year flood area has a 1% chance of flooding annually. Detailed flood mapping allows councils to undertake land use planning with greater certainty than previously because land owners and councils can better understand which parcels of land are likely to be inundated (under a given scenario) and 'targeted' land use planning provisions can be developed to avoid or minimise any increase in flood hazard risk.

With this in mind, the report has evaluated four different 'packages' of options to manage flood hazard risk: rolling over the status quo (existing provisions in the Regional Water and Soil Plan) as well as 'strong', 'medium' and 'light' regulatory approaches.

1 *Section 1.6, the Regional Policy Statement for Northland.*

The medium regulatory approach has come out as the preferred management option. The principle reason is that it best strikes a balance (relative to the other options) between environmental protection, allowing land owners of flood hazard-prone land to provide for their social and economic well-being, and avoid and mitigate any increase in flood hazard risk. The rules for this management option are summarised in the following table:

Earthworks in flood hazard areas	Flood protection structures	Structures and earthworks in floodplains and overland flow paths that divert flood flow	Minor bank protection structures
Permitted up to 100m^3, Controlled up to 1,000m^3 in flood hazard areas. Permitted up to 50m^3 in high risk flood hazard areas (rule in earthworks section).	Discretionary (rule in activities in beds of lakes and rivers section).	Discretionary (rules in earthworks and damming and diversion of water sections).	Permitted if <50m cumulatively over 200m stretch (rule in activities in beds of lakes and rivers section).

The two biggest changes from the existing rules are for re-consenting of materially damaged/destroyed buildings (of which there is no current rule) and earthworks in floodplains. The current permitted threshold for earthworks is 5000m^3 in any 12 month period (outside of the riparian management zone). It is proposed to 'permit' up to 50m^3 of earthworks in high risk flood hazard areas and up to 100m^3 in flood hazard areas. A controlled activity rule is proposed to be introduced that allows up to 1,000m^3 of earthworks, provided that the earthworks do not divert flood flow onto other property. The re-consenting of materially damaged or destroyed building rule allows site specific engineering solutions to be developed to cater for each unique situation, thereby reducing the risk of harm from further hazard events.

Coastal hazard risk

Natural coastal processes (such as erosion and inundation) become coastal hazards when they adversely affect things people value (such as buildings, property, and infrastructure) and threaten lives. Most of the existing and potential coastal hazard problems in Northland arise because of coastal subdivision and/or development being undertaken within close proximity to the coastal marine area boundary.

Our understanding of coastal hazard risk (and how to manage it) is constantly evolving. This is largely driven by the New Zealand Coastal Policy Statement's (coastal policy statement) requirement to identify areas of the coastal environment potentially affected by coastal hazards over at least the next 100 years and subsequent 'mapping' of these hazard prone areas.

The Regional Policy Statement for Northland (policy statement) has given effect to coastal hazard provisions within the coastal policy statement by introducing region-wide policies that require councils to give priority to the use of non-structural measures over the use of hard protection structures when managing coastal hazard risk and through requiring that any new use or development does not increase the risk of harm from coastal hazards. The new regional plan is now required to translate these higher level policies into more detailed, region-wide rules. This guidance, as well as new mapping of coastal hazard areas, means that council is in a better position to determine the appropriateness of activities that may increase coastal hazard risk in Northland.

With this in mind, the report has evaluated four different 'packages' of options to manage coastal hazard risk: rolling over the status quo (existing provisions in the Regional Water and Soil Plan and Regional Coastal Plan) as well as 'strong', 'medium' and 'light' regulatory approaches.

Overall, the medium regulatory approach is the preferred management option. The principle reason is that it best strikes a balance (relative to the other options) between protection and enhancement of natural features that act to 'buffer' the impacts of coastal hazards, avoiding any increase in risk of harm from coastal hazards and allowing land owners of land identified as at risk from coastal hazards to provide for their social and economic well-being and their on-going health and safety. The rules for this management area are summarised in the following table:

Placement of new hard protection structures	Veg clearance within coastal hazard management area	Earthworks within coastal hazard management area	Coastal dune restoration	Re-consenting of materially damaged buildings in high risk coastal hazard areas
Non-complying within mapped significant areas and discretionary elsewhere (rule in coastal structures section).	Permitted up to 200m^2 but discretionary for removal of any native dune vegetation (rule in vegetation clearance section).	Permitted up to 200m2 but no reduction in height of dune crests. (rule in earthworks section).	Permitted subject to conditions (rule in vegetation clearance section).	Restricted discretionary but Non-complying if there is no hazard assessment (rule in rebuilding section of land use and disturbance activities).

10.2 Legal background

Resource Management Act 1991

Under section 2 of the RMA, the term 'natural hazard' is defined as: "*Any atmospheric or earth or water related occurrence (including earthquake, tsunami, erosion, volcanic and geothermal activity, landslip, subsidence, sedimentation, wind, drought, fire or flooding) the action of which adversely affects or may adversely affect human life, property, or other aspects of the environment".*

The RMA provides a mandate for regional councils to manage natural hazards, climate change impacts and the effects of hazard mitigation measures on the environment. It is the primary statute driving the development of a regional plan and hazards provisions within the proposed regional plan. There are two main parts in the Act that address natural hazards and the resource management-related impacts associated with hazards management. Part 2 – purpose and principles, addresses the adverse impacts that the management of natural hazards can have on the environment and; Part 4 – functions, powers, and duties of central and local government that deals more directly with natural hazards.

Part 2 matters of the Act relevant to natural hazards can be found in sections 5 – purpose, 6 - matters of national importance and 7 – other matters, that address the effects that natural hazards can have on a community and the impacts that human activities can have on the natural environment, while attempting to mitigate natural hazards. Section 5(2) states that "*...sustainable management means managing the use, development and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic and cultural well-being and for their health and safety while; (a) sustaining the potential of natural and physical resources to meet the reasonably foreseeable needs of future generations; (b) safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and (c) avoiding, remedying, or mitigating any adverse effects of activities on the environment.*"

An amendment to the RMA in April 2017 resulted in the 'management of significant risks from natural hazards' becoming a Section 6 matter of national importance - s6(h). This change was recommended by the Royal Commission of Inquiry into the Chrishchurch earthquakes.

Section 7 states "*...all persons exercising functions and powers... in relation to managing the use, development, and protection of natural and physical resources, shall have particular regard to; (b) the efficient use and development of natural and physical resources; (g) any finite characteristics of natural and physical resources and; (i) the effects of climate change*". This has relevance to the increasing need to plan for the effects of climate change that can exacerbate natural hazards, particularly sea-level rise.

Under Section 9 (restrictions on land use) no person may use any land in a manner that contravenes a rule in a plan or proposed plan unless expressly allowed through a resource consent or it is an existing use with respect to s.20A of the Act. The word "use" in relation to land in section 9 means: *alter, demolish, erect, extend, place, reconstruct, remove, or use a structure or part of a structure in, on, under, or over land.*

Also under Section 9, no person may use land in a manner that contravenes a district rule unless the use is allowed by section 10 (this section covers existing use rights). Section 10 means that, for example, even if controls on building in hazard prone areas are introduced into district plans, existing use rights generally apply if buildings were 'lawfully established'. However, section 10 restrictions do not apply to land managed by regional councils under s9(2). Essentially, what this means is that regional councils can have rules to control the use of land to avoid or mitigate natural hazards and once operative (in the regional plan), existing use rights would no longer apply to this land.

Section 12 (restrictions on use of coastal marine area) outlines that in the coastal marine area, no person may erect, reconstruct, place, alter, extend, remove, or demolish any structure or any part of a structure that is fixed in, on, under, or over any foreshore or seabed unless expressly allowed by a national environmental standard, a rule in a regional coastal plan or a resource consent – 12(1)(b). This means that in the absence of a rule in a plan stating otherwise, people have to apply to the regional council for consent if they want to place new hard protection structures (such as seawalls) in the coastal marine area.

Section 13 (restriction on certain uses of beds of lakes and rivers) also outlines that in relation to the bed of any river, no person may use, erect, reconstruct, place, alter, extend, remove, or demolish any structure unless expressly allowed by a national environmental standard, a rule in a regional plan or a resource consent – s13(1)(a). This means that in the absence of a rule in a plan stating otherwise, people have to apply to the regional council for consent if they want to place new 'flood protection' structures in rivers and streams.

Section 30(1) (c) states "*every regional council shall have the following functions for the purpose of giving effect to this Act in its region – the control of the use of land for the purpose of:*

- *(iv) the avoidance or mitigation of natural hazards;*
- *(d) in respect of any coastal marine area in the region: (v) any actual or potential effects of the use, development, or protection of land, including the avoidance or mitigation of natural hazards and;*
- *(g) in relation to any bed of a water body, the control of the introduction or planting of any plant in, on, or under that land, for the purpose of (iv) the avoidance or mitigation of natural hazards."*

Section 68*: Regional rules* – under subsection 2(A), rules may be made for the protection of other property (as defined in section 7 of the Building Act 2004) from the effects of surface water, which require persons undertaking building work to achieve performance criteria additional to, or more restrictive than, those specified in the building code as defined in section 7 of the Building Act 2004.

Relevant RMA case law

With regards to planning horizons for managing coastal hazard risk, the courts have accepted that planning for a period of at least 100 years is appropriate, noting that such a time frame is considered sound in planning terms – refer to the *Waihi Beach, Skinner and Fore World Development* cases. The coastal policy statement also refers to 'areas potentially affected by coastal hazards over at least the next 100 years' (see policies 24, 25 and 27). Additionally, case law in which flood risk from rivers is considered in the context of design standards for flood protection measures, refers to planning horizons of a term no shorter than 100 years.

Relationship of rules to Building Act controls: Under s68(2A), a regional council has the power to prohibit or restrict activities such as residential occupation and the erection of buildings on a flood plain, for the purpose of avoiding or mitigating natural hazards (*Canterbury RC v Banks Peninsula DC, 1995*). The High Court in *Building Industry Authority v Christchurch CC*, found that the ability to create rules for the protection of 'other property' enabled regional and territorial authorities respectively to impose their own controls over the physical structure of a building to protect "other property" from the effects of surface water, notwithstanding that the Building Code contains performance criteria covering precisely the same subject-matter. This was necessary because performance criteria specified in the Building Code would otherwise have prevailed by virtue of s7(2). The effects of surface water on "other structures" was seen by Parliament as an exceptional situation where regional and territorial authorities required special powers to impose additional or more stringent controls on the structures/building work in circumstances where those controls might not be related to the use of the building or environmental effects.

Non-RMA legal framework

Effective natural hazard management (and associated risk management) is not undertaken via one single statute. Rather, effective and efficient region-wide management relies on a number of statutes. Key non-RMA statutes are:

- Building Act 2004 – the Building Act addresses building work in the interests of ensuring the safety and integrity of the structure through its construction and subsequent use. This focus is distinct from that of the RMA, which addresses the effects of that structure (or any activity within it) on the environment. The Building Act takes a 2% AEP view, which is a 50 year view with regards to the life of buildings. The definition of natural hazard under the Building Act is more narrowly confined than the RMA definition. Building consent can be refused if the land on which the building work is to be carried out is subject or *likely to be subject to a natural hazard,* unless adequate provision is made to protect the land or restore the damage.
- Soil Conservation and Rivers Control Act 1941 – this Act gives drainage and flood control powers to councils. It is the land owners or occupier's responsibility to maintain watercourses on their property to provide a free flow of water. The regional council can (under this act) require any land owner to do so.
- Land Drainage Act 1908 – this Act provides the regional council with responsibilities for land drainage and river clearance.
- Local Government Official Information and Meetings Act 1987 – information to be included on Land Information Memorandums (LIMs) under section 44A(2)(a) of the Act if things are a "potential natural hazard". This applies to district

councils and not regional councils but district councils have a statutory duty to provide flood and coastal hazard information on LIMs if the information/research can be considered authoritative, that is, if the regional council supplies them with natural hazard information such as maps of hazard prone areas.

- Local Government Act 2002 – the avoidance or mitigation of natural hazards is a 'core service' to be provided by local government under section 11A of the Local Government Act 2002. Section 101A of the Act states that local authorities must prepare long term plans outlining council expenditure over a 10-year period. As part of the long-term plan process, councils must prepare asset management plans for network infrastructure, flood protection and flood control works, outlining what the expected capital expenditure will be in order to maintain existing levels of service. Through the long term plan and asset management planning process, local authorities must make decisions about what level of natural hazard protection their assets are to provide (in the case of flood protection works) or what level of event they are to withstand (in the case of network infrastructure). Hazard management planning, as provided through the regional policy statement and the regional plan, is intimately connected to the long term plan process and its attendant asset and infrastructure management plans. The regional plan can control where development should or should not occur in the coastal marine area and the beds of lakes and rivers and can set the over-arching direction for the scale and pattern of development in areas that may be used for asset and infrastructure development. In this way it can help the development of more resilient infrastructure and has an important role to reduce the risks posed from natural hazards.

10.3 Planning documents

New Zealand Coastal Policy Statement 2010

Under the Resource Management Act 1991 (RMA), the only mandatory national policy statement is the NZ Coastal Policy Statement (coastal policy statement). Its purpose is to state policies in order to achieve the purpose of the RMA in relation to the coastal environment of New Zealand. Councils are required to amend their plans to give effect to coastal policy statement provisions that affect their respective documents as soon as practicable and councils, when considering an application for a resource consent and any submissions received, must have regard to any relevant provisions of the coastal policy statement.

The coastal policy statement contains five policies that are directly relevant to the management of natural hazards. These policies have helped guide the content of the Regional Policy Statement for Northland (policy statement) and have guided the content of the new regional plan with respect to avoiding or mitigating the adverse effects of coastal hazards. The five policies are:

- Policy 3 – *Precautionary approach;*
- Policy 24 – *Identification of coastal hazards;*
- Policy 25 – *Subdivision, use and development in areas of coastal hazard risk;*
- Policy 26 – *Natural defences against natural hazards; and*
- Policy 27 – *Strategies for protecting significant existing development from coastal hazard risk.*

Policy 3 requires (amongst other things) councils to adopt a precautionary approach towards use of coastal resources potentially vulnerable to effects from climate change so that avoidable social and economic loss and harm to communities does not occur and natural adjustments for coastal processes, natural defences and ecosystems are allowed to occur.

Policy 24 lays the foundation for risk-based coastal hazard management. It requires councils to identify areas of the coastal environment potentially affected by coastal hazards, giving priority to the identification of areas at high risk of being affected. Hazard risk assessments are to be undertaken using a planning horizon of at least 100 years (the policy lists eight factors that are required to be considered in the risk assessments), taking into account the latest national guidance on the likely effects of climate change on the region/district.

Policy 25 is the core policy for coastal hazard management. It sets the goal of avoiding increasing the risk of social, environmental and economic harm from coastal hazards over at least the next 100 years. It contains detailed policy relating to redevelopment and changes in land use (which includes new development), and general policy on encouraging infrastructure away from areas of coastal hazard risk, discouraging hard protection structures, and requires councils to consider the potential effects of tsunami.

Policy 26 seeks to protect, restore or enhance natural defences as the preferred way to protect the full range of coastal uses and values from coastal hazards.

Policy 27 deals with areas of significant existing development that are, or may become, affected by coastal hazards. Specific policy direction is required for such areas because, where there is significant existing development, the opportunity to avoid the risks from coastal hazards has already been missed. Policy 27 has an overall goal of identifying strategies that will reduce the risk of social, environmental and economic harm over the long-term in a climate-changed New Zealand.

It requires councils to focus on approaches to risk management that reduce the need for hard protection structures but also acknowledges that these structures might be the only practical means to protect existing regionally significant infrastructure. Additionally, when hard protection structures are necessary to protect private assets they should not be located on public land if there is no significant benefit in doing so.

National guidance documents

A number of guidance manuals published by the Ministry for the Environment address natural hazard management and provide guidance for local authorities in the planning and decision-making process. Many of these provide specific advice and hazard management principles that can be incorporated into the natural hazard provisions for the new regional plan.

Coastal hazard risk

Many land use planning decisions have long-term implications because of the permanency of built infrastructure. While it is a requirement under the RMA to manage the effects of climate change and coastal hazards, it is also good practice to consider climate change and longer term coastal change in coastal planning. Two guidance manuals that are relevant for coastal hazards management are:

- "Coastal Hazards and Climate Change: A Guidance Manual for Local Government in New Zealand, 2nd edition." Ministry for the Environment (2008); and
- "Preparing for Coastal Change: A Guide for Local Government in New Zealand." Ministry for the Environment (2009).

These documents are designed to support local authorities in managing coastal hazards and the increased pressures that climate change will bring to bear on coastal margins. They contain a lot of guidance that is relevant to policy development for regional plans. They contain specific examples about the effects of climate change on coastal hazards and provide best practice guidance to strengthen the integration of coastal hazards into the land use planning and consent decision process. In particular, they outline risk assessment frameworks for incorporating coastal hazards and climate change considerations into the decision-making process and promote the development of long-term adaptation strategies for managing coastal hazard risk.

Flood hazard risk

Flooding is the most costly hazard that the Northland Regional Council must manage and inflicts the greatest cost on the community in terms of direct impacts from flood events and mitigation measures. Climate change is expected to increase the hazards associated with flooding through increased intensity rainfall events.

In 2008, the Ministry for the Environment released a report entitled "Meeting the Challenges of Future Flooding in New Zealand"[(2)]. The report presented a vision for flood risk management in New Zealand to reduce the consequences of flooding. The findings from this report were incorporated into the guidance document:

- "Preparing for Future Flooding: A Guide for Local Government in New Zealand." Ministry for the Environment (2009).

The principles to guide future flood risk management policy can be summarised as:

- Take a precautionary approach to decision-making taking into account the level of risk, residual risk, existing knowledge and accounting for uncertainties.
- Use progressive risk reduction; new developments should not be exposed to, nor increase, flood risk over their intended lifetime. For existing developments the level of risk should be progressively reduced.
- Respect environmental limits and natural processes, including river and catchment processes, and protecting the life-supporting capacity of water, soil and ecosystems.
- Integrate flood risk management with sustainable land management and catchment management policies and decisions that affect the magnitude of flooding and/or the consequences of flooding.
- Consider the consequences of flooding, including the resilience and vulnerability of communities and infrastructure as well as the risk to life and property.
- Take a partnership approach with, and between, central government, local authorities, communities and Māori.
- Take an adaptive management approach that is responsive to change over time and that optimises sustainable structural, non-structural and emergency management solutions.

Climate change

Regional councils are responsible for a range of functions that may be affected by climate change under the RMA, including management of water resources and natural hazards. Two manuals that provide guidance for the inclusion of climate change effects in the regional plan are:

- Climate Change Effects and Impacts Assessment: A Guidance Manual for Local Government in New Zealand, 2nd Edition." Ministry for the Environment (2008); and
- Preparing for Climate Change: A Guide for Local Government in New Zealand." Ministry for the Environment (2008).

2 http://www.mfe.govt.nz/sites/default/files/meeting-challenges-of-future-flooding-in-nz.pdf

These manuals are designed to help councils identify and understand opportunities and hazards that climate change poses for their functions, responsibilities and infrastructure. Specifically, the manuals provide projections of future climate change around New Zealand and compare these projections with present climate extremes and variations. They identify potential effects on local government functions and services and outline methods for assessing the likely magnitude of such effects. They also explain how this information can be applied to assess the risk associated with various climate change impacts and provide guidance on incorporating climate risk assessments into local government regulatory and planning processes.

Currently, the Ministry for the Environment recommends the following projections of future sea level rise are used for planning: for planning and decision time frames out to 2090-2099 use a base value sea level rise of 0.5m relative to the 1980-1999 average, along with an assessment of potential consequences from a range of possible higher sea level rise values. For planning and decision time frames beyond the end of this century, use an additional allowance of 10mm per year.

Regional Policy Statement for Northland

The Regional Policy Statement sets out a framework for managing natural hazard risk in Northland. The objective is to minimise the risks and impacts of natural hazard events on people, communities, property and the regional economy by:

- Increasing our understanding of natural hazards (including the potential influence of climate change on hazard events);
- Not compromising the effectiveness of existing defences (both man-made and natural);
- Enabling appropriate hazard mitigation measures to be created; and
- Promoting long-term strategies to reduce the risk of hazard events impacting on people and communities.

Another key focus of natural hazard management is to avoid inappropriate new development in 10 year and 100 year flood hazard areas and coastal hazard areas. With regards to policies, chapter 7 deals exclusively with natural hazard risk and is divided into 2 sections. 7.1 primarily focusses on new development in hazard prone areas, while 7.2 provides guidance on 'soft' and 'hard' mitigation measures. It seeks to recognise and protect, restore or enhance natural systems and features that contribute to reducing the impacts of natural hazard events; to avoid impediments to accessing established structural mitigation assets (such as flood gates or sea walls); and provides guidance on determining when hard protection structures can be considered an appropriate option for mitigating natural hazard risk.

A key focus of section 7.1 is managing new subdivision and development in 10 year and 100 year flood hazard areas and areas potentially affected by coastal hazards. This section also provides guidance on managing existing development in hazard prone areas, guidance on when regionally significant and critical infrastructure can be considered appropriate within flood and coastal hazard areas and requires climate change to be taken into account when managing use and development in Northland. The Regional Policy Statement has adopted a planning horizon time frame out to 2115 for sea-level rise and is using a baseline of one metre.

The Regional Policy Statement sets out a new approach to managing natural hazard risk in 'high risk' flood hazard areas (10 year flood hazard areas). It proposes that when buildings are materially damaged or destroyed, the regional council (through the relevant regional plan) will require land use consent for the repair or reconstruction of the building. This gets around the issue of existing use rights because they do not apply to regional plans – only district plans (see section 9 of the RMA). When implemented, this will be a shift away from the current approach (as the Regional Water and Soil Plan currently does not contain any similar rule(s)).

District plans

Section 31(1)(b)(i) of the RMA gives district councils the function of controlling any actual or potential effects of the use, development or protection of land for the purpose of 'the avoidance or mitigation of natural hazards'. Practically, this means they are required to include policies and methods (including rules) in district plans to manage land use and subdivision to avoid or mitigate natural hazard risk.

Another 'tool' that district councils are able to use to manage natural hazard risk is section 106 of the RMA. This gives district councils the ability to refuse to grant subdivision consent applications if they consider that the land in respect of which consent is sought, or any structure on the land, is or is likely to be subject to material damage by erosion, falling debris, subsidence, slippage, or inundation from any source. Additionally, they may refuse to grant consent if it is considered that any subsequent use of the land is likely to accelerate, worsen or result in material damage to the land, other land or structure and if sufficient provision has not been made for legal and physical access to each allotment to be created by the subdivision.

District councils must have good information about the potential risks of natural hazards before they invoke measures like section 106 because this has the ability to curtail people's economic and social well-being.

In Northland, it has been agreed (through the operative Regional Policy Statement) that the regional council will concentrate on identifying risks of regional significance – principally coastal erosion and inundation, flooding in major catchments and drought, whereas district councils will focus on more localised erosion, flooding, land instability and fire risk.

Coastal hazard areas have been mapped for locations in the Far North and Whangārei districts – these areas are identified in the respective district plan maps and are subject to various rules restricting development in coastal hazard areas. All district plan maps contain maps of indicative areas susceptible to flooding and district councils usually require applicants to commission site specific assessments from engineers if they want to undertake developments within areas potentially susceptible to flooding.

Iwi and hapū environmental management plans

Specific reference to flood hazard risk does not feature in the Tangata Whenua Issues and Options Report, prepared by Keir Volkerling in February 2015 [3]. This aside, climate change (including its potential to increase hazard risk) is a general issue within this report and is recognised as an issue of significance to iwi in the Proposed Regional Policy Statement for Northland. Climate change is also referenced in several iwi/hapū environmental management plans.

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3 http://http://www.nrc.govt.nz/contentassets/0d3e217aec2346549fdbd0b3e579c501/review-of-the-nrc-regional-plans---tangata-whenua-issues-and-options----final.pdf

10.4 Flood hazard risk

10.4.1 Executive summary

Under section 2 of the RMA, the term 'natural hazard' is defined as: *"Any atmospheric or earth or water related occurrence (including earthquake, tsunami, erosion, volcanic and geothermal activity, landslip, subsidence, sedimentation, wind, drought, fire or flooding) the action of which adversely affects or may adversely affect human life, property, or other aspects of the environment".*

It should be noted that the d Plan does not contain a specific natural hazards rules section. This is because natural hazards are essentially natural occurrences that have the potential to adversely affect things – they are not an activity (such as wastewater discharges) regulated by sections 12, 13, 14 or 15 of the RMA in the strictest sense. What we have done therefore is divided the various natural hazard provisions into the relevant activity sections (such as activities in the beds of rivers). This section 32 evaluation report will direct readers to what section of the Plan the relevant natural hazard rules can be found.

Flooding provides the highest natural hazard risk to Northland because of the extensive existing development on floodplains and the region's exposure to high intensity rainfall events.

This report looks at activities that are impacted by, or impact on, flood hazard events. This includes:

- Earthworks in floodplains;
- Structures in flood plains (including re-consenting of materially damaged buildings in 10 year flood hazard areas) that divert flood flow;
- Excavation of river beds; and
- Flood protection and miner bank protection structures in river beds.

The report outlines that through new information (such as the Priority Rivers Flood Risk Reduction Project), the regional council now has detailed flood hazard maps for priority catchments in the region (available online at www.nrc.govt.nz/priorityrivers. These maps show the likely extent of river flooding during a 10-year or 100-year flood event. A 10-year flood area has a 10% chance of flooding annually, whilst the more extensive 100-year flood area has a 1% chance of flooding annually. Detailed flood mapping allows councils to undertake land use planning with greater certainty than previously because land owners and councils can better understand which parcels of land are likely to be inundated (under a given scenario) and 'targeted' land use planning provisions can be developed to avoid or minimise any increase in flood hazard risk.

With this in mind, the report has evaluated four different 'packages' of options to manage flood hazard risk: rolling over the status quo (existing provisions in the Regional Water and Soil Plan) as well as 'strong', 'medium' and 'light' regulatory approaches.

The medium regulatory approach has come out as the preferred management option. The principle reason is that it best strikes a balance (relative to the other options) between environmental protection, allowing land owners of flood hazard-prone land to provide for their social and economic well-being, and avoid and mitigate any increase in flood hazard risk. The rules for this management option are summarised in the following table:

Earthworks in 1% Annual Exceedance Probability floodplains	Flood protection structures	Structures and earthworks in floodplains and overland flow paths that divert flood flow	Minor bank protection structures
Permitted up to 100m^3 but 50m^3 in mapped 10 year flood hazard areas (rule in earthworks section).	Discretionary (rule in activities in beds of lakes and rivers section).	Discretionary (rules in earthworks and taking, using damming and diversion of water sections).	Permitted if <50m cumulatively over 200m stretch

Earthworks in 1% Annual Exceedance Probability floodplains	Flood protection structures	Structures and earthworks in floodplains and overland flow paths that divert flood flow	Minor bank protection structures
			(rule in activities in beds of lakes and rivers section).

The two biggest changes from the existing rules are for re-consenting of materially damaged/destroyed buildings (of which there is no current rule) and earthworks in floodplains. The current permitted threshold for earthworks is 5000m^3 in any 12 month period (outside of the riparian management zone). It is proposed to 'permit' up to 50m^3 of earthworks in high risk flood hazard areas and up to 100m^3 in flood hazard areas. A controlled activity rule is proposed to be introduced that allows up to 1,000m^3 of earthworks, provided that the earthworks do not divert flood flow onto other property. The re-consenting of materially damaged or destroyed building rule allows site specific engineering solutions to be developed to cater for each unique situation.

10.4.2 Relevant provisions

This evaluation supports the following Regional Plan provisions relating to flood hazard management:

- Policy - D.6.3 Re-building of materially damaged or destroyed buildings in high risk hazard areas
- Policy - D.6.4 Flood hazard management – flood defences
- Policy - D.6.5 Flood hazard management – development within floodplains

The following rules, which are in various sections:

- Earthworks within floodplains - Section C.8.3
- Obstructions that divert water onto other property– Section C.3 Damming and diverting water
- Minor bank protection structures, maintenance of free flow of water in rivers, new flood defences – Section C.2.1 Activities in the beds of lakes and rivers
- Re-building materially damaged or destroyed buildings - Section C.8.6

10.4.3 The problem, opportunity and/or requirement

Flooding is the most frequent natural hazard that affects Northland, threatening human life, disrupting communications and access, damaging property and reducing primary production[(4)]. This is because of extensive existing development on floodplains and the region's exposure to high intensity rainfall events. Modification of the natural environment (such as the drainage of wetlands), has exacerbated the flood hazard risk.

When vulnerable development is located in floodplains (such as residential dwellings), the wider community often experiences the consequences of this risk-taking in terms of social and economic costs (such as general rates being spent on flood mitigation), as people generally underestimate the consequences of hazards. Additionally, there is constant pressure on councils to remove or reduce hazard risk experienced by private development, as well as for development to seek to pass the hazard risk onto someone else (whether that be adjoining landowners or future property owners).

It is difficult to assess the true financial cost of flooding events in Northland. The Insurance Council of New Zealand provides some information on natural disaster claims but these are grouped based on the event and not necessarily region by region[(5)]. Some recent events affecting Northland include the following:

4 *See the natural hazards section of the Northland Regional Council 2012 State of the Environment Report available online at http://www.nrc.govt.nz/resources/?url=%2FResource-Library-Summary%2FEnvironmental-Monitoring%2FState-of-the-Environment-Monitoring%2FOur-place%2FNatural-hazards%2F*

5 *See cost of disaster events in New Zealand http://www.icnz.org.nz/statistics-data/cost-of-disaster-events-in-new-zealand/*

- 2015 (July) flooding and storm – upper North Island: $6.15m;
- 2014 (July) Northland – Coromandel storms: $18.8m;
- 2011(January) storm and flooding – Bay of Plenty to Northland: $19.8m; and
- 2007 (March) storm event – Far North, Northland: 12.5m.

It is fair to say that the cost of direct damage to private property is largely borne by land owners and/or through insurance. However, the cost of natural disasters is also shared by the wider community through increased insurance premiums, which have risen in response to the significant and increasing cost of natural disaster claims. This is likely to increase throughout the century as with climate change, Northland is projected to have more frequent and intense rainfall events and more heavy rainfall will increase the risk of flooding, which could become up to four times as frequent by 2090[(6)].

Other costs of flood hazard events include:

- Direct impacts, caused by exposure to the flood hazard. Examples include drowning in floodwater or risk to those people involved in rescue operations.
- Infrastructure assets, such as roads, railway and utility lines, are impacted during flood events. Route security of Northland's road network is impacted during larger flood events, with local roads and state highways temporarily closed due to inundation or damage to the road that renders it impassable. Impacts on utilities that provide services to the community are not just limited to direct damage to the utility itself, but have wider impacts for those using or relying on the continued functioning of that service. Examples include disruption to electricity networks, which result in impacts for affected communities including loss of refrigerated/frozen food, inability to pump fuel and loss of business.
- Primary productivity is impacted through inundation and loss of stock and damage to pasture. Inundation of flood waters for greater than 72 hours can result in pasture die-off, which has a long-lasting impact on productivity from pastoral farming.
- There is also a significant cost, both tangible (easy to quantify) and intangible (difficult to quantify) associated with flooding. Tangible costs include damage to homes and infrastructure assets. Intangible costs relate to lost productivity due to inability to travel to work, stress, health impacts and environmental damage.

This section looks at activities that are impacted by, or have the potential to exacerbate, flood hazard events. These include:

- Earthworks in one percent annual exceedance probability floodplains. This is defined as any land that has a 1% chance in any year of being inundated due to high river flows. Those catchments where the spatial extent of the 1% AEP floodplain has been mapped by the regional council are referred to as mapped 100 year flood hazard areas;
- Structures in flood plains (including re-consenting of materially damaged buildings in 10-year flood hazard areas);
- Excavation of river beds; and
- Hard protection and miner bank protection structures.

It does not cover stormwater management 4.7 'Stormwater discharges', dam structures Could not finds14445925600986.3 'Dams, diversions, and fresh water structures' and land drainage activities 5.4 'Land drainage and river control activities'. These topics are covered in other sections.

Cumulative effects are a significant issue to deal with in flood hazard management and generally, the Resource Management Act (and our regional plans) do not deal well with cumulative effects that are created by small incremental increases in adverse effects (such as through undertaking earthworks or placing structures on floodplains). When people undertake use and development on floodplains and land that is susceptible to flooding, flood hazard risk can be increased for other activities and infrastructure, located upstream and downstream of the site. For example, earthworks (either in combination or isolation) can alter/divert flood paths and overland flow paths (thereby relocating adverse effects elsewhere), impede drainage and reduce floodplain capacity. Without setting thresholds or trigger points, there is a real risk of cumulative effects occuring.

6 *Ministry for the Environment, Climate change projections for the Northland region* *http://www.mfe.govt.nz/climate-change/how-climate-change-affects-nz/how-might-climate-change-affect-my-region/northland*

Current rules in the Regional Water and Soil Plan do not specifically regulate earthworks within flood plains. Outside the riparian management zone, the 'permitted' threshold for earthworks is 5,000m^3 in any 12 month period. This is a substantial amount to 'permit' on floodplains and this volume has potential to either cumulatively or individually have significant effects on floodplain dynamics and increase the risk of harm from flood hazard events (both upstream and downstream). See the natural hazard section of the 10-year review of the regional plans for more information.[7]

The inappropriate placement of structures on flood plains has the potential to increase the risk of harm from flood hazard events, both by creating a 'new' hazard and exacerbating existing hazard risk by diverting flood waters onto neighbouring properties (such as by placing structures on overland flow paths).

Currently, under the Regional Water and Soil Plan, resource consent is technically required for any damming or diverting of surface water (such as through earthworks or the placement of structures on overland flow paths). However, there is no consistent application of this rule and it is difficult for both members of the public and regional council staff to know when activities trigger a requirement to apply for a resource consent under this rule. Clearer guidance is therefore required.

Under Section 9 of the Resource Management Act, no person may use land in a manner that contravenes a district rule unless the use is allowed by Section 10 (this section covers existing use rights). For example, this means that if controls on building in hazard prone areas are introduced into district plans, existing use rights generally apply if buildings were 'lawfully established', meaning that if the building was destroyed in a flood, applicants could rebuild their dwelling 'as of right', provided it is within the same footprint of the dwelling. However, Section 10 restrictions do not apply to land managed by regional councils under s9(2). Therefore in order to reduce flood hazard risk to existing dwellings in the most susceptible locations, it has been identified[8] that the regional council should control (via a rule) re-building of materially damaged or destroyed buildings in 10 year flood hazard areas. This is a prudent approach to natural hazard risk management because climate change is projected to result in a greater amount of high intensity short duration rain events, which may result in more frequent flooding over the coming years.

The regional councils understanding of risk posed by flood hazards is evolving. Hazard events are infrequent and irregular. Projections as to their occurance (timing and size) and consequences (impacts) generally improves as more events are experienced and recorded.

Through the Priority Rivers Flood Risk Reduction Project (online at www.nrc.govt.nz/priorityrivers), the regional council now has detailed 10 year and 100 year flood hazard maps for the priority catchments in the region. These maps identify which parcels of land will be inundated in a one in 10 year flood and a one in 100 year flood. As the regional council progressively defines and maps areas susceptible to flooding, this information will be passed onto the district councils for incorporation in their respective district plans as well as affected land owners. Detailed flood mapping allows councils to undertake land use planning with greater certainty than previously because land owners and councils can better understand which parcels of land are likely to be inundated under a given scenario and land use planning provisions can be developed to avoid or minimise any increases in flood hazard risk.

Several existing permitted activity provisions relating to natural hazard management in the Regional Water and Soil Plan are considered (by staff) to be working well because they strike a good balance between enabling flood hazard mitigation works to occur without needing consent while avoiding adverse effects. It is suggested that these are 'rolled over' into this Plan. These include:

- The 'permitted' excavation or disturbance of beds of rivers for the purpose of maintaining the free flow of water in the river, including minor channel realignments and clearance of debris blockages – s27.1.3.
- The 'permitted' placement of minor structures in or on the bed of rivers for the purpose of bank protection so long as the length of the protection works is not more than 50m in length cumulatively over any 200m stretch of the river bank – s29.1.8.

7 *Available online at http://www.nrc.govt.nz/contentassets/0d3e217aec2346549fdbd0b3e579c501/regional-plan-review-summary---natural-hazards.pdf*

8 *See section 1.1 of natural hazards section of 10 year review of the regional plans available online at http://www.nrc.govt.nz/contentassets/0d3e217aec2346549fdbd0b3e579c501/regional-plan-review-summary---natural-hazards.pdf*

10.4.4 Management options

This section summarises the management options for managing flood hazard risk. The intention is not to identify every different combination of approach as there would be many, but to represent the range of options and highlight key differences in approaches. Options presented are; rolling over existing Regional Water and Soil Plan Provisions as well as comparatively 'stronger', 'medium' and 'lighter' regulatory approaches.

This Plan does not contain a specific flood hazard section. This is because natural hazards are essentially natural occurrences that have the potential to adversely affect things – they are not an activity (such as wastewater discharges) regulated by sections 12, 13, 14 or 15 of the RMA in the strictest sense. What we have therefore done is divided the various flood hazard related rules into the relevant activity section of the new regional plan (such as activities in the beds of rivers).

The options focus on the different status for the following activities:

- Earthworks within one percent AEP floodplains (rule can be found within the earthworks section);
- Flood protection structures (rule in activities in beds of lakes and rivers section);
- Structures and earthworks within floodplains that divert flood flow onto neighbouring properties (rules in earthworks and taking, using damming and diversion of water sections); and
- Minor bank protection structures (rule in activities in beds of lakes and rivers section).

There are some provisions in the current regional plans that we don't think need changing and are unlikely to be contentious. There are also some new provisions we think are obvious for this Plan. The following is a list of these uncontentious and obvious provisions that will be implemented regardless of the option selected:

- Repair and maintenance of existing flood protection structures in water bodies will be a 'permitted' activity (subject to compliance with conditions, which will include that there is no increase in height or length of the structure and the maintenance does not exacerbate flood hazard risk). The repair of existing structures is currently permitted in the Regional Water and Soil Plan and no reasons have been raised (by staff) as to why this should not continue.

- Existing Regional Water and Soil Plan permitted rule for maintenance of free flow of water in rivers is working well (there have been no complaints about the thresholds of the rule and what it is trying to achieve) and can be rolled over into this Plan.

- The re-building of materially damaged or destroyed buildings in high risk coastal hazard areas will be a restricted-discretionary activity (if the application includes a natural hazard assessment from a suitably qualified professional) and council will limit its discretion to avoiding or mitigating natural hazards. This direction has come out of the new Regional Policy Statement for Northland – Method 7.1.7(8). If there is no natural hazard assessment, the application will be treated as a non-complying activity.

Key terms

The following is an explanation of the key terms used in describing the options:

Flood hazard area

Land that has a 1% chance in any year of being inundated due to high river flows.

High risk flood hazard area

Land where there is at least a 10% chance of river flooding occurring annually.

Overland flow paths

The path taken by surface stormwater crossing a property. They are low points in the terrain (outside of streams and identified water courses), which will accommodate flood flows in a one percent rainfall event.

Flood defence

Means any structure or equipment, including any bund, weir, spillway, floodgate, bank, stopbank, retaining wall, rock or erosion protection structure or groyne, that is designed to have the effect of stopping, diverting, controlling, restricting or otherwise regulating the flow, energy or spread of water, including floodwaters, in or out of a water body or artificial watercourse.

Option A: roll over existing provisions in Regional Water and Soil Plan related to managing flood hazard risk

Overview: small-scale activities are generally permitted but larger scale activities require resource consent, where there is a greater risk of impact from flood hazard events.

Background: this option would involve council 'rolling over' all provisions relating to flood hazard management in the existing Regional Water and Soil Plan. This option would not include specific rules for earthworks on flooodplains.

Earthworks within flood hazard areas	Flood defences	Structures and earthworks in floodplains and overland flow paths that divert flood flow	Minor bank protection structures	Key policy approach
Permitted up to 5000m^3 outside riparian management zone. Permitted up to 50m^3 in riparian management zone. Discretionary – all else.	Discretionary.	Discretionary (no explicit rule).	Permitted up to 50m cumulatively over 200m stretch.	• Encourage land uses on floodplains that do not result in adverse effects or increased risk to people or properties arising from the passage of flood waters across floodplains. • Promote structures/works that are effective at controlling floodwaters and in mitigating the effects of flooding and minimising erosion.

Option B: strong regulatory approach

Overview: includes management of earthworks within one percent AEP floodplains but specifically focusses on placement of earthworks fill[(9)]. This option also explicitly regulates structures in overland flow paths and floodplains that divert flood flows onto neighbouring properties.

Background: this option represents a 'heavy regulatory' approach and would see many non-complying activities. The earthworks example is similar to that in Auckland's Unitary Plan, which has a 'permitted' volume of 10m^3 within 100 year AEP floodplains.

9 *As filling of floodplains leads to a loss of floodplain storage capacity and can lead to flood waters being diverted onto neighbouring properties.*

Earthworks in flood hazard areas	Flood defences	Structures and earthworks in floodplains and overland flow paths that divert flood flow	Minor bank protection structures	Key policy approach
Permitted up to 50m^3 but 10m^3 in high risk flood hazard areas (FHAs).	Non-complying.	Non-complying.	Discretionary.	• Ensure all development in 1% AEP floodplains do not increase adverse effects from flood hazard events. • Promote measures that reduce flood-related effects, including construction of flood protection structures and re-consenting of materially damaged habitable buildings.

Option C: medium regulatory approach

Overview: similar to heavy regulatory approach, in that earthworks and structures within flood hazard areas that divert flood flow onto neighbouring properties will require resource consent as a discretionary activity. However, this includes a controlled activity rule for earthworks in flood hazard areas between 100 and 1000m^3. Minor bank protection rule essentially same as status quo.

Background: this option represents a 'middle of the line approach' between the heavier and lighter regulatory approach, with most structures requiring consent as discretionary activities.

Earthworks in flood hazard areas	Flood defences	Structures and earthworks in floodplains and overland flow paths that divert flood flow	Minor bank protection structures	Key policy approach
Permitted up to 100m^3 but controlled between 100 and 1000m^3. 50m^3 in high risk FHAs otherwise discretionary.	Discretionary	Discretionary	As option A	As option B

Option D: light regulatory approach

Overview: no prohibited or non-complying activities – the most enabling option from the perspective of allowing land owners and developers to 'develop' and 'protect' their land from potential impacts of flood hazard events. Placement of flood protection structures and structures/earthworks that divert flood flows onto neighbouring properties would be a controlled activity, meaning council would have to grant consent to the applicant.

Background: the most enabling of options tested in that all activities are either permitted or controlled activities.

Earthworks in 1% AEP floodplains	Flood defences	Structures and earthworks in floodplains and overland flow paths that divert flood flow	Minor bank protection structures	Key policy approach
Permitted up to 1000m^3 but 100m^3 in high risk FHAs otherwise discretionary.	Controlled.	Controlled.	Permitted >100m cumulatively over 200m stretch.	As option B.

Comparison of options:

Management option	Earthworks in high risk flood hazard areas	Earthworks in flood hazard areas	Flood protection structures (inc spillways and stopbanks)	Structures in overland flow paths that divert flood flow	Minor bank protection structures (outside rivers with outstanding values)
1. Status quo	Permitted less than 5000m^3 outside riparian management zone. Permitted less than 50m^3 in riparian management zones. Discretionary – all else.	Same as high risk FHA.	Discretionary.	No explicit rule but discretionary – Rule 24.3.3.	Permitted >50m cumulatively over 200m stretch.
2. Heavy regulatory	Permitted less than 10m^3. Non-complying greater than 10m^3.	Permitted less than 50m^3. Discretionary greater than 50m^3.	Non-complying.	Non-complying.	Discretionary.
3. Medium regulatory approach	Permitted less than 50m^3. Discretionary greater than 50m^3.	Permitted less than 100m^3 Controlled betwen 100 - 1000m3 Discretionary greater than 1000m^3.	Discretionary.	Discretionary.	As status quo.

Management option	Earthworks in high risk flood hazard areas	Earthworks in flood hazard areas	Flood protection structures (inc spillways and stopbanks)	Structures in overland flow paths that divert flood flow	Minor bank protection structures (outside rivers with outstanding values)
4. Light regulatory approach	Permitted less than $100m^3$. Discretionary greater than $100m^3$.	Permitted less than $1000m^3$. Discretionary greater than $1000m^3$.	Controlled.	Controlled.	Permitted >100m cumulatively over 200m stretch.

10.4.5 High level objectives and measures

Section 32 requires an assessment of "*...the efficiency and effectiveness of the provisions in achieving the objectives...*". Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section 1.6 'Evaluation approach' for more details.

'High level objectives':

- Capture the fundamental things (or values) that matter to people (the key costs and benefits) when determining the best management option;
- Signal a direction for where we want to head, without stating how far we go; and
- Are what the management options are assessed against to determine their efficiency and effectiveness (s32(1)(b)(ii)).

Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against.

High level objective	Measure
New activities within floodplains minimise the risk of harm on other property from flood hazard events.	Constructed measure on likelihood of individual activities increasing risk of harm to other property: 1 = significant increase in risk (compared to 'status quo). 2 = moderate increase in risk. 3 = no increase in risk. 4 = moderate reduction in risk. 5 = significant reduction in risk.
Maximise certainty and minimise regulatory costs to flood protection structure proponents.	Resource consent activity status and cost: 1 = non-complying (typically limited or fully notified) = $3144. 2 = discretionary (typically non-notified) = $839.

High level objective	Measure
	3 = controlled (typically non-notified) = $839. 4 = permitted activity = not applicable ($0). Note: costs do not include those associated with preparing the application or hearing costs.
Minimise adverse effects on the natural environment.	Ability to practicably control adverse effects: 1 = minor control (likely that adverse effects could occur). 2 = moderate control (medium likelihood that adverse effects could occur). 3 = significant control (unlikely that adverse effects could occur). 4 = full control (impossible that adverse effects could occur – structures prohibited).

New activities within floodplains minimise the risk of harm on other property from flood hazard events

This high level objective has been selected because structures and placement of earthworks fill, have the potential to increase the risk of harm to other properties from flood hazard events, particularly when the activities result in flood water being diverted onto neighbouring properties. The constructed measure that has been created assesses the likelihood of individual activities increasing the risk of harm to other properties. The reference point is existing provisions in the operative Regional Water and Soil Plan (status quo) as these have been in place for more than 10 years. This is therefore a fair reference point to determine whether or not the chosen management option will either (theoretically) lead to an increase in flood hazard risk, a reduction in flood hazard risk or no change.

For example, it is anticipated that the suite of rules in the 'strong regulatory approach' option (non-complying activity for new flood defences and only 50m^3 of permitted earthworks in floodplains) would see a reduction in risk because of the requirement to have the effects of activities scrutinised through the resource consent process if they divert flood flow onto neighbouring property. As this measure involves a degree of 'crystal ball gazing', it is too difficult to quantify (through a percentage) what the increase or reduction in hazard risk could theoretically be. It is therefore acknowledged that there will be a degree of judgement in any assessment.

Maximise certainty and minimise regulatory costs to flood protection structure proponents

The high level objective has been chosen because there is generally an expectation from land owners that they will be able to protect their property (through flood protection structures) from the impacts of flood hazard events. Their 'ability' to protect their property is dependent on rule classifications for the activities in the regional plan.

The measure for this objective therefore looks at the cost and activity status for new structures. This ranges from a 'non-complying' activity (which has an application fee of over $3000 and no guarantee of getting resource consent), to a 'permitted' activity (with no cost and hassle factor).

Minimise adverse effects on the natural environment

This objective has been chosen because, depending on factors such as location and size, permitting or granting resource consent to the placement of flood protection structures and other activities has the potential to cause adverse effects on the natural environment. The degree to which adverse effects can practicably be minimised is directly related to the activity status of rules in plans. This objective differs from the first objective because it focuses on how the 'natural' environment may be adversely affected (by activities on floodplains), whereas the first objective focuses on the potential for activities (of individuals) to increase the risk of harm to other property.

We have used a constructed measure to assess whether the management options are likely to practicably control (avoid or mitigate) adverse effects on the environment. The measure ranges from minor control (1), which can be viewed as a permitted or controlled activity, to full control (4), which equates to a prohibited activity. A constructed measure has been used because it is very difficult to quantify the actual and potential adverse effects of any particular management option. This will also be contingent on a judgement of how resource consents would be processed.

Objectives not included

Section 32 requires an assessment of the impacts on economic growth and employment opportunities (s32(2)(a)). However, the impact of the options on these cannot be perceived and/or determined with any confidence. Therefore, economic growth and employment opportunities have not been included as high level objectives. For more information go to the section 1.7 'Assessing impacts on economic growth and employment opportunities' section.

10.4.6 Evaluating the management options

High level objective and measure	Status quo	Option B – stricter regulatory approach	Option C – medium regulatory approach	Option D – lighter regulatory approach
	Evaluation	Evaluation	Evaluation	Evaluation
New activities within floodplains minimise the risk of harm on other property from flood hazard events (compared to status quo). *Measure:* Likelihood of individual activities increasing risk of harm to other property. 1 = significant increase in risk (compared to 'status quo). 2 = moderate increase in risk. 3 = no increase in risk. 4 = moderate reduction in risk. 5 = significant reduction in risk.	3	5	4	3
Maximise certainty and minimise regulatory costs to flood protection structure proponents. *Measure:* Resource consent activity status and cost. 1 = non-complying (typically limited or fully notified) = $3144. 2 = discretionary (typically non-notified) = $839. 3 = controlled (typically non-notified) = $839.	2 for flood defences and 4 for minor protection structures.	1 for flood defences and 2 for minor bank structures.	2 for flood defences and 4 for minor protection structures.	3 for flood defences and 4 for minor protection structures.

High level objective and measure	Status quo	Option B – stricter regulatory approach	Option C – medium regulatory approach	Option D – lighter regulatory approach
	Evaluation	Evaluation	Evaluation	Evaluation
4 = permitted activity = not applicable ($0).				
Minimise adverse effects on the natural environment. *Measure:* Ability to practicably control adverse effects. 1 = minor control (likely that adverse effects could occur). 2 = moderate control (medium likelihood that adverse effects could occur). 3 = significant control (unlikely that adverse effects could occur). 4 = full control (impossible that adverse effects could occur – structures prohibited).	2	3	2	2

Certainty about the evaluation

There is always uncertainty about the potential impacts of management options. We're moderately confident about the accuracy of the evaluation for all the options. We don't think it would be viable and/or worthwhile to get more information to increase the accuracy of our evaluation, the main reason being that it is very unlikely to change the relative differences between the options. Probably the two high level objectives where there is the most uncertainty (but not enough to warrant getting more information) are the first and last. They are a judgement (of whether risk will be increased and the extent of adverse effects) and inherently a judgement of people's responses has a degree of uncertainty.

Time-frame

The evaluation is made over the life-time of the plan (10-15 years).

Preferred management option

The preferred management option is Option C: medium regulatory approach.

Option C (medium regulatory approach) is the preferred management option because overall, it is considered to best address the outcomes. The principle reason is that it best strikes a balance (relative to the other options) over the high level objectives. This option ranked second (behind option B) against the first objective. It is anticipated that it would lead to a moderate reduction in risk of harm to other property because the threshold for permitted earthworks of floodplains is significantly lower than existing rules. It ranked second-equal against the second objective (slightly behind option D) and second-equal against the last objective.

Overall, the 'stricter regulatory' approach (Option B) is not the preferred option. While it ranked first with regards to minimising the risk of new activities increasing risk of harm to other property, this benefit is outweighed by the increased costs to land owners wanting to protect their property from flood hazard events – it ranked the worst against the second objective. Weighing up the objectives, greater weight has been given to the second objective because it is the objective with the most

certainty (meaning there is less 'crystal ball gazing') because the measure directly relates to resource consent activity status. Additionally, the degree to which adverse effects on the environment are minimised and risk of harm to other properties is minimised will come down to individual design and a case-by-case basis.

Option A ('status quo') is not the preferred approach because overall, it is considered that rolling over the current provisions would not sufficiently manage flood hazard risk, such as the risk of earthworks cumulatively increasing flood hazard risk in floodplains. This option scored the worst against the first objective.

The 'softer regulatory' approach (option D) is not the preferred option because although it would be favourable to land owners (because of the permissive activity status of proposed rules), it is considered that it would fail to sufficiently minimise the risk of adverse effects (and harm) from flood hazard events increasing. For example, the placement of flood protection structures within one percent AEP floodplains would be a 'controlled' activity, meaning that council has to grant the resource consents. Additionally, new structures and earthworks fill within floodplains and overland flow paths that diverted flood flows onto neighbouring properties would also be a 'controlled' activity. Council would therefore have to grant consent for activities that potentially increase flooding effects on other property. It is acknowledged that through a 'controlled' activity, council can have control over such things as location, design and scale of activities but the key point is that at the end of the day, resource consents would have to be granted.

10.5 Coastal hazard risk

10.5.1 Executive summary

Under section 2 of the RMA, the term 'natural hazard' is defined as: *"Any atmospheric or earth or water related occurrence (including earthquake, tsunami, erosion, volcanic and geothermal activity, landslip, subsidence, sedimentation, wind, drought, fire or flooding) the action of which adversely affects or may adversely affect human life, property, or other aspects of the environment".*

It should be noted that this Plan does not contain a specific natural hazards rules section. This is because natural hazards are essentially natural occurrences that have the potential to adversely affect things – they are not an activity (such as wastewater discharges) regulated by sections 12, 13, 14 or 15 of the RMA in the strictest sense. What we have done therefore is divided the various natural hazard provisions into the relevant activity sections (such as coastal structures). This section 32 evaluation report will direct readers to what section of the Plan the relevant natural hazard rules can be found.

Coastal hazard risk

Natural coastal processes (such as erosion and inundation) become coastal hazards when they adversely affect things people value (such as buildings, property, and infrastructure) and threaten lives. Most of the existing and potential coastal hazard problems in Northland arise because of coastal subdivision and/or development being undertaken within close proximity to the coastal marine area boundary.

Our understanding of coastal hazard risk (and how to manage it) is constantly evolving. This is largely driven by the New Zealand Coastal Policy Statement's (coastal policy statement) requirement to identify areas of the coastal environment potentially affected by coastal hazards over at least the next 100 years and subsequent 'mapping' of these hazard prone areas.

The Regional Policy Statement for Northland (policy statement) has given effect to coastal hazard provisions within the coastal policy statement by introducing region-wide policies that require councils to give priority to the use of non-structural measures over the use of hard protection structures when managing coastal hazard risk and through requiring that any new use or development does not increase the risk of harm from coastal hazards. This Plan is now required to translate these higher level policies into more detailed, region-wide rules. This guidance, as well as new mapping of coastal hazard areas, means that council is in a better position to determine the appropriateness of activities that may increase coastal hazard risk in Northland.

With this in mind, the report has evaluated four different 'packages' of options to manage coastal hazard risk: rolling over the status quo (existing provisions in the Regional Water and Soil Plan and Regional Coastal Plan) as well as 'strong', 'medium' and 'light' regulatory approaches.

Overall, the medium regulatory approach is the preferred management option. The principle reason is that it best strikes a balance (relative to the other options) between protection and enhancement of natural features that act to 'buffer' the impacts of coastal hazards, avoiding any increase in risk of harm from coastal hazards and allowing land owners of land identified as at risk from coastal hazards to provide for their social and economic well-being and their on-going health and safety. The rules for this management area are summarised in the following table:

Placement of new hard protection structures	Veg clearance within coastal hazard management area	Earthworks within coastal hazard management area	Coastal restoration works	Re-consenting of materially damaged buildings in high risk coastal hazard areas
Non-complying within mapped significant areas and discretionary elsewhere (rule in coastal structures section).	Permitted up to 200m^2 but discretionary for removal of any native dune vegetation (rule in vegetation clearance section).	Permitted up to 200m2 then discretionary (rule in earthworks section).	Permitted subject to conditions (rule in vegetation clearance section).	Restricted discretionary if accompanied by a natural hazard assessment or else non-complying (rule in re-building section of land use and disturbance activities).

10.5.2 Relevant provisions

This evaluation supports the following Regional Plan provisions relating to coastal hazards:

- Policy - D.6.1 Natural hazards – modification or damage to natural defences
- Policy - D.6.2 Appropriateness of hard protection structures
- Policy - D.6.3 Design and location of hard protection structures
- Policy - D.6.4 Re-consenting of materially damaged or destroyed buildings in high risk hazard areas
- Rule C.1.1.8 - Maintenance, repair or removal of hard protection structures - permitted activity
- Rule C.1.1.17 - Hard protection structures - discretionary activity
- Rule C.1.1.18 - Hard protection structures associated with regionally significant infrastructure - discretionary activity
- Rule C.1.1.19 - Hard protection structures in areas with significant values - non-complying activity
- Rule C.2.3.1 - Earthworks within coastal hazard management area – permitted activity
- Rule C.2.4.1 - Vegetation clearance and coastal dune restoration within coastal hazard management area – permitted activity
- Rule C.2.4.4 - Vegetation clearance – discretionary activity
- Rule C.2.7.1 - Re-building of materially damaged or destroyed buildings – restricted-discretionary activity
- Rule C.2.7.2 - Re-building of materially damaged or destroyed buildings – non-complying activity

10.5.3 The problem, opportunity and/or requirement

Natural coastal processes (such as erosion and inundation) become coastal hazards when they adversely affect things people value (such as buildings, property, and infrastructure) and threaten lives. Most of the existing and potential coastal hazard problems in Northland arise because of coastal subdivision and/or development being undertaken within close proximity to the coastal marine area boundary.

Throughout this century, the risk that coastal hazards pose to Northland's communities is likely to be increased by climate change effects. Climate change will not create any new coastal hazards, but in many locations it will exacerbate existing coastal erosion or inundation problems. Impacts on Northland's coastal margins due to sea-level rise and possible climate change impacts on other physical drivers that shape the coast will likely include:

- Increased coastal erosion;
- More extensive coastal inundation;

- Higher storm surge flooding; and
- Increased drainage problems in adjacent low-lying areas.

Even though coastal hazards tend to cause most damage on land (such as by eroding or inundating land adjacent to the coast), our existing Regional Water and Soil Plan does not actively manage coastal hazard risk. For example, it does not regulate the placement of hard coastal protection structures such as seawalls.

Although hard protection structures have traditionally been the 'go to' option to manage coastal erosion risk, the New Zealand Coastal Policy Statement 2010 (coastal policy statement) has brought in a stricter regime to manage coastal hazards than the previous coastal policy statement (1994). The 'new' coastal policy statement now requires councils to discourage hard protection structures and to promote the use of alternatives to them, including natural defences. It also requires councils to 'avoid' increasing the risk of harm from coastal hazards in areas potentially affected over at least the next 100 years and to encourage redevelopment or change in land use that would reduce the risk of adverse effects from coastal hazards.

Our understanding of coastal hazard risk (and how to manage it) is constantly evolving – largely driven by the coastal policy statement's requirement to identify areas of the coastal environment potentially affected by coastal hazards over at least the next 100 years and subsequent hazard 'mapping' of these area. For example, coastal erosion hazard risk was assessed for 29 priority sites during 2014, with the final reports received in October 2014. This assessment has resulted in two coastal hazard zones for each site, based on 50 year and 100 year planning horizons. These are known as coastal erosion hazard 1 and coastal erosion hazard 2 areas.

Additionally, the regional council initiated a coastal inundation hazard project in 2015. The project covers 61 coastal areas, including all areas of LiDAR (LIght Detection And Ranging) survey adjoining the open coast, harbour and estuarine areas. Most of the 29 sites covered under the coastal erosion hazard assessment are also included, which will assess future storm surge risk in 50 and 100 years time (2065 and 2115 respectively). The assessment covers the major centres of Whangarei, and Dargaville, as well as expansive low lying rural areas which have not previously been assessed for coastal inundation risk, such as Ruawai, the Lower Wairoa, and the Lower Awanui. Draft maps were released to affected land owners for feedback in June 2016 and the maps are expected to be finalised in late 2017.

The Regional Water and Soil Plan (water and soil plan) currently regulates land use above the mean high water springs through a coastal riparian management zone. This zone was created as a placeholder to regulate land disturbance activities (primarily earthworks and vegetation clearance) at the land-sea interface until specific provisions were developed (none have yet been developed).

The coastal riparian management zone has limited regard to the spatial and temporal variability of coastal landforms and processes in Northland and in many locations, the landward extent of this zone is insufficient to manage coastal hazard risk. A coastal riparian management zone exists in locations where:

- A foredune exists (such as Matapouri and Tauranga Bay) – this riparian management zone occurs between mean high water springs and the toe of the foredune on the landward facing slope. This applies to vegetated or unvegetated sand dunes).
- At the top of a bank sloping landward from the coastal marine area boundary – this riparian management zone occurs between mean high water springs and the distance (up to 20m) from the top of the first landward bank dependent on the dominant slope as used for the riparian management zone.

This definition captures rocky coastlines, estuarine coasts and sand beaches with a modified foredune. In locations where there is no dominant slope (where land adjacent to the coastal marine area is flat), there is no coastal riparian management zone. This means that earthworks and vegetation clearance are currently permitted within the reach of wave run-up, as effects on coastal processes are not controlled through the section 32 environmental standards in the water and soil plan – they primarily exist to manage soil conservation and water quality.

Coastal hazard risk can be reduced by protecting/restoring natural landforms and features (such as dunes and riparian vegetation) that help reduce the impacts of coastal hazard events on existing settlements and thereby lessening the risks posed to people and property. These natural landforms often have high natural character and amenity values, meaning that their preservation/protection can serve multiple purposes.

With regards to coastal hard protection structures, the existing coastal plan contains rules to manage these but the water and soil plan does not. This means that under regional rules, people can currently construct hard protection structures above the coastal marine area without any consideration of alternative options and the impacts (for example, on adjacent beach,

access to the beach and erosion effects on neighbouring properties). District councils regulate structures above mean high water springs but not all councils specifically regulate 'hard' protection structures, meaning that a consent is not always required for the placement of 'protection' works above mean high water springs.

The Regional Policy Statement for Northland (policy statement) has given effect to coastal hazard provisions within the NZ Coastal Policy Statement by introducing region-wide policies that require councils to give priority to the use of non-structural measures over the use of hard protection structures when managing coastal hazard risk and through requiring that any new use or development does not increase the risk of harm from coastal hazards. This Plan is now required to translate these higher level policies into more detailed, region-wide rules. This guidance, as well as new mapped coastal hazard areas, means that council is in a better position to determine the appropriateness of activities that may increase coastal hazard risk in Northland.

10.5.4 Management options

This section summarises the options for managing coastal hazard risk. The intention is not to identify every different combination of approach as there would be many, but to represent the range of options and highlight key differences in approaches.

The Proposed Regional Plan does not contain a specific coastal hazard section. This is because coastal hazards are essentially natural occurrences that have the potential to adversely affect things (such as people, land and buildings) – they are not an activity (such as wastewater discharges) regulated by sections 12, 13, 14 or 15 of the RMA in the strictest sense. What we have therefore done is divided the various coastal hazard related rules into the relevant activity sections of this Plan.

The options below focus on the different status for the following activities:

- Hard protection structures (rule in coastal structures section).
- Vegetation clearance within the coastal hazard management area (rule in vegetation clearance section).
- Earthworks within the coastal hazard management area (rule in earthworks section).
- Coastal dune restoration works (rule in vegetation clearance section).

Four options are presented: rolling over the status quo provisions in existing regional plans and then a comparatively 'strong', 'medium' and 'light' regulatory approach.

The strong and medium regulatory approaches include a 'coastal hazard management area', which would specifically apply to managing earthworks and vegetation clearance. This 'zone' would be similar to the coastal riparian management zone in the operative Regional Water and Soil Plan. The light regulatory approach does not have a coastal hazard management area and would rely on other land disturbance rules within the new plan.

All of the options except for the status quo include a 'coastal dune restoration' rule. The parameters of this work will be defined in the plan and would essentially enable councils, community groups etc to undertake restoration work that restores or enhances natural defences against coastal hazards.

There are some provisions in the current regional plans that we don't think need changing and are unlikely to be contentious. Also, there are some new provisions we think are obvious for this Plan. The following is a list of these uncontentious and obvious provisions that will be implemented regardless of the option selected:

- As required by higher level policy guidance (that is, coastal policy statement Policy 27 and Policy 7.2.2 of proposed policy statement), preference will be given to non-structural measures (including natural defences) when managing coastal hazard risk. Policy guidance will be drafted to assist in determining when and where hard protection structures can be considered 'appropriate' to manage coastal hazard risk

- Maintenance of existing authorised hard protection structures will be a 'permitted' activity subject to compliance with conditions. This is because it is currently permitted and staff have not raised any issues with the rule.

- Extensions or additions to existing authorised hard protection structures will be a 'discretionary' activity. This is the current activity status and it is considered appropriate as any potential adverse effects associated with extending/expanding the structure need to be assessed.

- The re-consenting of materially damaged or destroyed buildings in high risk coastal hazard areas will be a restricted-discretionary activity if accompanied by a natural hazard assessment (non-complying if not) and council will limit its discretion to avoiding or mitigating natural hazards. This direction has come out of the Regional Policy Statement for Northland – Method 7.1.7(8).

Key terms

An explanation of the key terms used in describing the options:

Significant marine areas

These are the areas described in policies 11(a) (biodiversity), 13(1)(a) (natural character),15(a) (natural features and landscapes) and 16 (surf breaks) of the New Zealand Coastal Policy Statement 2010. These policies direct that adverse effects on the prescribed outstanding/significant values must be avoided. Maps of these areas have been included in this Plan.

Coastal dune restoration

A programme designed to return or restore a coastal environment to a more natural state, with the aim of allowing the active beach and dune system to better function as a natural system. Coastal dune restoration can involve all or some of the following activities: removal of exotic flora and fauna, removal of fill/spoil, rock, rubble or other introduced materials, dune recontouring to achieve a more natural substrate and/or shape and/or the planting of appropriate native plant species. It does not include works involving hard protection structures.

Coastal hazard management area

This zone is:

1) Any land within a horizontal distance of 10m landward from the coastal marine area; and
2) The land between the coastal marine area and the bottom of the landward side of the foredune, where the land adjacent to the coastal marine area is vegetated or unvegetated sand dunes.

Option A: roll over existing Regional Water and Soil Plan and Regional Coastal Provisions

Overview: Management of hard protection structures in the coastal marine area only (not on land). No specific rule for dune restoration. This sits around the middle of the spectrum of options.

Background: this option would involve council 'rolling over' all provisions relating to coastal hazard risk management within the existing regional plans into the new regional plan.

Placement of new hard protection structures	Vegetation clearance within riparian management zone	Earthworks within riparian management zone	Coastal dune restoration	Key policy approach
Non-complying in significant areas and discretionary elsewhere in coastal marine area. No control above line of mean high water springs.	Permitted up to 200m^2.	Permitted up to 200m2 and 50m^3	No rules in the coastal marine area so discretionary activity. Vegetation clearance and earthworks rules in coastal riparian management zone apply on land but no	No specific policies in Water and Soil Plan. Coastal Plan seeks to promote a consistent approach to natural hazard management, protect natural systems which are a defence against erosion and inundation, ensure that protection works are the best practicable option and provide for the maintenance of existing authorised protection works.

Placement of new hard protection structures	Vegetation clearance within riparian management zone	Earthworks within riparian management zone	Coastal dune restoration	Key policy approach
			specific rule promoting dune restoration.	

Option B: strong regulatory approach

Overview: includes management of hard protection structures above and below line of mean high water springs and strong policy direction to avoid placement of new hard protection structures.

Background: this option provides an example of a more restrictive management regime. No activities would be 'permitted'.

Placement of new hard protection structures	Vegetation clearance within coastal hazard management area	Earthworks within coastal hazard management area	Coastal dune restoration	Key policy approach
Non-complying everywhere.	Discretionary.	Discretionary.	Discretionary.	Strong policy approach towards avoiding hard protection structures.

Option C: medium regulatory approach

Overview: includes managing hard protection structures above and below line of mean high water springs. Introduces a new consenting requirement for the removal of any native dune vegetation within the coastal hazard management area. Earthworks within the coastal hazard management area must not reduce the height of a dune crest.

Background: this option represents a 'middle of the line approach'. The options here are similar to Auckland Council's approach in its Unitary Plan.

Placement of new hard protection structures	Vegetation clearance within coastal hazard management area	Earthworks within coastal hazard management area	Coastal dune restoration	Key policy approach
Non-complying within significant natural areas and discretionary elsewhere.	Permitted up to 200m^2 but discretionary for removal of any native dune vegetation.	Permitted up to 200m^2 (includes no reduction in height of dune crest) otherwise discretionary.	Permitted subject to conditions including no lowering of dune crest and removal of native dune vegetation.	Guidance on when hard protection structures are appropriate and how they should be designed.

Option D: light regulatory approach

Overview: no prohibited or non-complying activities – the most enabling option from the perspective of allowing land owners and developers to 'develop' and 'protect' their land from potential impacts of coastal hazard events.

Background:the most enabling of options tested. Represents a very 'permissive' approach.

Placement of new hard protection structures	Vegetation clearancewithin coastal hazard management area	Earthworks within coastal hazard management area	Coastal dune restoration	Key policy approach
Discretionary.	Same as general vegetation clearance provisions.	Same as general earthworks provisions	As option C above.	Similar to option C above.

10.5.5 High level objectives and measures

Section 32 requires an assessment of "*...the efficiency and effectiveness of the provisions in achieving the objectives...*". Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section 1.6 'Evaluation approach' for more details.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. They also signal a direction for where we want to head, without stating how far we go – that comes later (they are the beginnings of objectives).

Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against.

High level objective	Measure
New hard protection structures and land disturbance activities minimise the potential for any increase in risk of harm on other property from coastal hazard events.	Extent that individual activities may increase risk of harm to adjoining properties (constructed measure): 1 = significant increase in risk (compared to existing provisions). 2 = moderate increase in risk. 3 = no increase in risk. 4 = moderate reduction in risk. 5 = significant reduction in risk.

High level objective	Measure
Reduce red tape for restoration and enhancement of natural features (particularly sand dunes) that provide protection against coastal hazards.	Extent to which rules enable coastal restoration works by reducing need for resource consents: 1 = discretionary activity – consent required (no guarantee). 2 = controlled activity – consent required (must be granted). 3 = permitted – no consent required.

New hard protection structures and land disturbance activities minimise the potential for any increase in risk of harm on other property from coastal hazard events

This high level objective has been selected because both inappropriately designed and located hard protection structures and land disturbance activities (such as vegetation clearance and earthworks) have the potential to increase the risk of harm from coastal hazard events. The constructed measure that has been created for this outcome assesses the extent to which individual activities may increase the risk of harm (compared to the reference point, which is existing coastal hazard provisions in the regional plans).

Depending on the management option assessed, there should either be a reduction in risk, an increase in risk or no increase in risk. For example, it is anticipated that the suite of rules in the 'strong regulatory approach' option (non-complying activity for new hard protection structures and discretionary activity for any earthworks or vegetation clearance) would see a reduction in risk because of the requirement to have the effects of all activities (above and below the line of mean high water springs) scrutinised through the resource consent process.

Reduce red tape for restoration and enhancement of natural features (particularly sand dunes) that provide protection against coastal hazards

This outcome has been included because the New Zealand Coastal Policy Statement explicitly (through the objectives and policies) seeks to protect or restore natural defences against coastal hazards and seeks to promote the restoration or rehabilitation of the natural character of the coastal environment. It also requires councils to provide rules in plans directed at restoration and rehabilitation, including the rehabilitation of dunes and other natural coastal features (see objective 5 and policies 14 and 26)[10]. The new regional policy statement implements this national direction by promoting the restoration and enhancement of natural features that contribute towards reducing the impacts of natural hazard events. It also requires that priority be given to the use of non-structural measures over the use/construction of hard protection structures when managing natural hazard risk.

The measure looks at the extent to which proposed rules would enable coastal restoration works (for example, what the resource consent consent activity would be). This ranges from a 'discretionary' activity, which requires a resource consent and theoretically could be declined, to a 'permitted' activity, which does not require a resource consent.

Objectives not included

Section 32 requires an assessment of the impacts on economic growth and employment opportunities (s32(2)(a)). However, the impact of the options on these cannot be perceived and/or determined with any confidence. Therefore, economic growth and employment opportunities have not been included as high level objectives. For more information go to the section 1.7 'Assessing impacts on economic growth and employment opportunities'.

An objective related to avoiding adverse effects on values of 'significant natural areas' (mapped significant marine biodiversity areas, outstanding natural character areas and outstanding natural landscapes and features) was considered but not pursued because most demand for hard protection structures is going to come in built-up/developed locations (not 'significant' areas with little or no development). There is also the New Zealand Coastal Policy Statement and Regional Policy Statement requirement to 'avoid' adverse effects on the values and characteristics of the significant areas, which will 'kick in' at the

10 http://www.doc.govt.nz/about-us/science-publications/conservation-publications/marine-and-coastal/new-zealand-coastal-policy-statement/new-zealand-coastal-policy-statement-2010/

resource consent stage – when considering a resource consent application under s104, the council must have regard to any actual and potential effects on the environment of allowing the activity – s104(1)(a). The placement of new hard protection structures will not be a controlled or permitted activity and therefore potential impacts of the activity on the 'significant areas' can be weighed up during the consent application.

Additionally, objectives relating to 'maximising the ability of land owners to protect their property and assets from impacts of coastal hazard events' and 'minimising the effect of new hard protection structures on public access to and along the coastal marine area' were considered but disregarded for the following reasons:

1) Both potential objectives related directly to the placement of new hard protection structures.
2) Under all management options, the most permissive activity status for new hard protection structures is a 'discretionary' activity, which means that consent can be declined if the adverse effects are deemed to be too high and the application is contrary to policy direction.
3) There is no 'prohibited' activity status under any option, which means that applications can be applied for anywhere.
4) The constructed measure for both potential options would relate back to the proposed activity status (for each of the management options) and therefore it would be too difficult to determine any meaningful difference between the different management options (because there would be no permitted, controlled or prohibited activity status).
5) As mentioned above, this therefore means that each resource consent application would be treated on its merits on a case-by-case basis with ability and discretion to approve or decline.

10.5.6 Evaluating the management options

High level objective	Status quo	Option B – strong regulatory approach	Option C – medium regulatory approach	Option D – light regulatory approach
	Evaluation	Evaluation	Evaluation	Evaluation
New hard protection structures and land disturbance activities minimise the potential for any increase in risk of harm on other property from coastal hazard events. *Measure:*	3	5	4	2
Reduce red tape for restoration and enhancement of natural features (particularly sand dunes) that provide protection against coastal hazards. *Measure:* *1 = discretionary activity – consent required (no guarantee).* *2 = controlled activity – consent required (must be granted).* *3 = permitted – no consent required.*	1	1	3	3

Certainty about the evaluation

There is always uncertainty about the potential impacts of management options. We're moderately to highly confident about the accuracy of the evaluation for both objectives. We don't think it would be viable and/or worthwhile to get more information to increase the accuracy of our evaluation. The main reason being that it is very unlikely to change the relative differences between the options. The objective where there is the most uncertainty (but not enough to warrant getting more information)

is the first one because the extent to which individual activities *may* increase the risk of harm is a judgement and inherently a judgement of people's responses has a degree of uncertainty. The second objective relates directly to resource consent activity status and therefore is certain.

Time-frame

The evaluation is made over the life-time of the plan (10-15 years).

The preferred management option

Option C (medium regulatory approach) is the preferred management option because overall, it is considered to best address the two high level objectives. The principle reason is that it best strikes a balance (relative to the other options) between restoration and enhancement of natural features that provide 'protection' from the impacts of coastal hazard events and minimising any increase in risk of harm. It ranked second against the first objective (behind option B) but includes requirements that no native dune vegetation be removed and that there shall be no reduction in height of dune crests (for land disturbance activities). This is considered to go some way in ensuring that activities will not increase the risk of harm for adjoining properties (as dunes can provide protection for landward property from the effects of coastal hazard events). It ranked first equal with option D against the second objective.

Overall, option B (strong regulatory approach) has come out as the second best option, slightly behind the medium regulatory option. It scored best against the first objective but the worst equal against the second objective. Overall, it is considered that a non-complying activity status for any new hard protection structure and a discretionary activity status for any vegetation clearance, earthworks or coastal restoration work is too restrictive/prohibitive, which is why this option is not recommended.

Rolling over the 'status quo' (option A) is not the preferred approach because overall, it ranked the worst of the four options tested. The New Zealand Coastal Policy Statement promotes the restoration and enhancement of natural defences against coastal hazards (such as sand dunes) but the status quo scored badly against this measure because the operative coastal plan does not permit this. The operative Regional Water and Soil Plan does not control the placement of hard protection structures currently, which is why this option has scored the lowest against the first objective. It is considered that under this option, there is a higher chance (relative to the other options) of an *increase* in the risk of harm from coastal hazard events.

The light regulatory approach (option D) is not the preferred option because it is considered that there is a greater chance that individual land disturbance activities may increase the risk of harm (from coastal hazard events) to adjoining properties, which is the main reason why this option is not recommended. There is no coastal hazard management zone under this option and therefore land disturbance activities would default back to 'general' earthworks and vegetation clearance thresholds.

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11 Hazardous substances, contaminated land and solid waste

11.1 Legal background

Resource Management Act 1991

The Resource Management Act 1991 (RMA) provides the basis for the management of contaminated land in New Zealand. It is the primary statute for the development of the proposed Regional Plan provisions for contaminated land, hazardous substances and solid waste.

Section 5 requires the sustainable management of natural and physical resources to be managed in a way that enables people and communities to provide for their social, economic and cultural well-being and their health and safety. Contaminated land (this includes open and closed landfills) can directly impact people's health and safety especially where sites may be particularly toxic from a discharge into air, or where people live or have contact with the land. Section 5 also requires that the life-supporting capacity of the soil, air and water and ecosystems is safeguarded. Having contaminated land in the region reduces the life-supporting capacity of that land. All of the effects from contaminated land will need to be managed over time to reduce the long-term effects on the environment, to enable the land to be useful for current and future generations.

Section 6 requires regional plans to recognise and provide for matters of national importance. Contaminated land, the discharge of solid waste and the discharge of hazardous substances are related to the matters mentioned in section 6, as these discharges can affect the natural character of freshwater bodies and the coastal marine area, and significant indigenous flora and fauna.

Section 7 requires for the management of natural and physical resources that particular regard is made to various matters. In relation to contaminated land, section 7(f) (the maintenance and enhancement of the quality of the environment), and section 7(g) (any finite characteristics of natural and physical resources) are the most relevant. By its very nature contaminated land in the region reduces the quality of the environment. In most cases the land cannot be used for the intended purpose if it is highly contaminated.

By managing contaminated land through the regional plan process, this allows for future uses. The environment is also generally improved through this management process. Since the total land area in the region is finite, contaminated land reduces the area of land available for use. For example, if certain parts of the region contain large areas of contaminated land then future land uses are limited and the remaining area of suitable land may command a high cost for development. The management of the land through the regional plan can, over time, reduce the area of land that is contaminated in certain parts of the region.

Section 9 controls the use of land in district and regional plans. Regional rules can place controls on the use of land for the purposes specified in section 30. Many land-use controls are placed by district plans. Subdivision of contaminated land is regulated by a national environmental standard (see below) and by rules in district and regional plans. The environmental standard supersedes rules in district plans although district plans may have specific requirements for contaminated land outside the standard.

Section 15 is relevant to contaminated land, solid waste and hazardous substances. Regional plans control discharges into or onto land and water. The RMA is restrictive for discharges from any industrial and trade premises and non-restrictive for all other premises. The discharge from contaminated land in or to the environment is solely controlled by provisions in regional plans.

Section 30(c)(v) and section 30(ca) relate to contaminated land and hazardous substances. Part (v) requires that regional plans control the use of land to prevent and mitigate any adverse effect from the storage, use, disposal or transport of hazardous substances. Section 30(c)(ii-iiia) sets out councils' responsibilities in relation to water quality and the health of ecosystems in water bodies. These functions are relevant for solid waste, hazardous substances and contaminated land.

Hazardous Substances and New Organisms Act 1996

The Hazardous Substances and New Organisms Act 1996 has the main purpose to protect the environment, and the health and safety of people and communities, by preventing or managing the adverse effects of hazardous substances and new organisms.

The Act was passed in June 1996 and represented one of the most significant reforms of environmental legislation since the Resource Management Act. It came into force in two stages. Provisions relating to new organisms took effect in July 1998. The provisions relating to hazardous substances came into force on 2 July 2001.

The Act established the Environmental Risk Management Authority (ERMA) to assess and decide on applications to introduce hazardous substances or new organisms into New Zealand. This includes genetic modification of plants, animals and other living things in New Zealand. In July 2011, ERMA became the Environmental Protection Authority (EPA).

As discussed above there is a relationship between the two acts as the RMA requires regional and district councils to control the use, storage, disposal and transport of hazardous substances. The regional policy statement delegates land-use controls for hazardous substances on land to city and district councils and land-use controls in the coastal marine area and the beds of lakes and rivers to the regional council.

11.2 Planning documents

National policy statements

National policy statements are instruments issued under section 52(2) of the RMA. The national policy statements state the objectives and policies for matters of national significance. The national policy statement must be given effect to in regional plans and regional policy statements.

There are four operative national policy statements in place:

- National Policy Statement on Electricity Transmission 2008;
- National Policy Statement for Renewable Electricity Generation 2011;
- New Zealand Coastal Policy Statement 2010; and
- The National Policy Statement for Freshwater Management 2014.

The National Policy Statement for Freshwater Management 2014 (freshwater policy statement) requires regional councils to recognise the national significance of freshwater for all people in the region and Te Mana o te Wai (the mana of water).

There is a list of direct requirements for regional councils in the freshwater policy statement, including safeguarding freshwater's life-supporting capacity, ecosystem process, people's health, protection of the significant values of wetlands and outstanding water bodies, the efficient use of water and over-allocation of water takes and the input of contaminants, and to phase out over-allocation.

More importantly, the freshwater policy statement requires the setting of freshwater objectives to meet community values and tangata whenua values which include ecosystem health, and human health for recreation. Regional councils have to set limits which allow freshwater objectives to be met under a specified set of water quality measures to set the objectives. The freshwater policy statement also requires measures to account for the source of contaminants.

Where contaminated land and hazardous substances provisions relate to the freshwater policy statement is in the location of contaminated land within a catchment, and the overall cumulative effect of discharges from these areas to the total catchment contaminant load.

New Zealand Coastal Policy Statement

The New Zealand Coastal Policy Statement 2010 (coastal policy statement) is the only mandatory national policy statement under the RMA. The purpose of the coastal policy statement is to state policies to achieve the purpose of the RMA, in order to promote the sustainable management of natural and physical resources in relation to New Zealand's coastal environment (RMA section 56).

The coastal policy statement has objectives and policies that regional plans must give effect to, for the management of the coastal marine area. Policy 23(5)(a) and (b) is the most relevant to contaminated land and the discharges of hazardous substances. This policy requires that particular regard is given to managing discharges in general, in relation to the receiving environment, human sewage, and the discharges from ports and other marine facilities.

National environmental standards

National environmental standards (environmental standards) are regulations issued under section 43 of the RMA and apply nationally. The national environmental standards are for maintaining a clean, healthy environment. The government sets standards where appropriate so that everyone in New Zealand has clear air to breathe, clean water to drink, and clean land to live on. They prescribe technical standards, methods or other requirements for environmental matters. Each regional, city or district council must enforce the same standard and in certain circumstances, councils can impose stricter standards. The following national standards are in effect:

- National Environmental Standards for Air Quality 2004;
- National Environmental Standard for Sources of Human Drinking Water 2008;
- National Environmental Standards for Telecommunication Facilities 2008;

- National Environmental Standards for Electricity Transmission Activities 2009; and
- National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health 2012.

National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health

The National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (contaminants standard) came into effect 1 January 2012 and prescribes technical standards, methods and other requirements for the regulation of contaminated land.

The contaminant standard places controls on certain activities or industries on land that are:

- Described in the Hazardous Activities and Industries List (HAIL); and
- If an activity that has been on HAIL land; and
- If it more than likely an activity or industry described in the HAIL is being or has been undertaken.

The activities controlled by the contaminant standard are:

- Replacing a fuel storage system;
- Sampling a piece of land to determine whether or not it is contaminated, and if it is, the amount of contamination; and
- Subdividing a piece of land and changing a piece of land, which means changing its use is likely to harm human health.

The standard does not affect existing land uses. It classifies as permitted activities (meaning no resource consent required if stated requirements are met):

- Removal or replacement of fuel storage systems and associated soil, and associated subsurface soil sampling;
- Small-scale (no greater than 25 cubic metres per 500 square metres of affected land) and temporary (two months duration) soil disturbance activities; and
- Subdividing land or changing land use where a preliminary investigation shows it is highly unlikely the proposed new use will pose a risk to human health.

Activities requiring a resource consent under the standard include:

- The development of contaminated land where the risk to human health from soil contamination does not exceed the applicable soil contaminant value (classified as a controlled activity, meaning resource consent must be granted);
- The development of contaminated land where the risk to human health from soil contamination exceeds the applicable soil contaminant value (classified as a restricted discretionary activity); and
- The development of land where the activity does not meet the requirements to be a restricted discretionary, controlled or permitted activity (classified as a discretionary activity).
- Territorial authorities and unitary authorities enforce the standard. Councils cannot impose stricter rules in their regions. The role of the regional council is to manage the effects on the environment from contaminated land.

National guidelines

There are a number of national guideline documents to support the management of contaminated land and hazardous substances in New Zealand. Most of these guideline documents can be viewed on the government websites for the Ministry for the Environment and the Environmental Protection Authority (EPA).

Below is a list of the common guidelines used in the management of contaminated land. These guidelines have been developed by the Ministry for the Environment in partnership with regional councils and unitary authorities:

- Contaminated Land Management Guidelines No. 1 – Reporting on Contaminated Sites in New Zealand (Revised 2011); details the type and amount of information required in a contaminated site report.
- Contaminated Land Management Guidelines No. 2 – Hierarchy and Application in New Zealand of Environmental Guideline Values (Revised 2011); ensures the consistent selection and application of environmental guideline values.

- Contaminated Land Management Guidelines No. 3 – Risk Screening System; describes the risk screening system which provides a nationally consistent way to rank sites that are, or are suspected of being, contaminated. The purpose of ranking a site is usually so it may be prioritised for further investigation.
- Contaminated Land Management Guidelines No. 4 – Classification and Information Management Protocols; suggests a nationally consistent way to classify, manage and release contaminated site information held on council registers or databases.
- Contaminated Land Management Guidelines No. 5 – Site Investigation and Analysis of Soils (Revised 2011); provides best practice for sampling and analysing soils on sites where hazardous substances are present or suspected and guidance on the principles for interpreting the data obtained.

The EPA website (www.epa.govt.nz) has links to various sources of information for the registration, use, and disposal of hazardous substances. The hazardous substances Act also has regulations pertaining to the use of certain hazardous substances in New Zealand.

The Minstry for the Environment has also endorsed several guidelines on the management of solid waste. These guideline are:

- Technical Guidelines for Disposal to Land, 2016 - these guidelines were produced by the Waste Management Institute New Zealand. The guidelines seeks to establish "good practice requirements" for the various types of landfill facilities based on waste acceptance criteria.
- A Guide to the Management of Cleanfills
- A Guide to the Management of Closing and Closed Landfills in New Zealand (2001)
- A Guide to Landfill Consent Conditions (2001);
- Landfill Full Cost Accounting Guide for New Zealand (2004)

11.3 Solid waste

11.3.1 Executive summary

This section evaluates the options for managing solid waste activities in the new Regional Plan. The relevant Regional Plan provision are:

- Rules C.6.7.1 - C.6.7.7- Solid waste
- Policy D.4.1.1 - Discharges from landfills
- Policy D.4.12 - Application of bio-solids to land

The RMA provides a mandate for regional councils to manage discharges to land where contaminants may enter water [1]. This report looks at solid waste activities, the opportunities or problems that arise as a result of these activities taking place and the options for managing these problems. For the purposes of this plan solid waste activities are:

- Cleanfill;
- Compost;
- On-site waste disposal (on farms and other non-industrial sites);
- Bio-solids;
- Waste transfer stations; and
- Land fill.

Disposal of solid waste to land is currently managed by the regional council through the Regional Water and Soil Plan (water and soil plan) and the Regional Coastal Plan (coastal plan) to fulfil its functions under section15(1) of the Resource Management Act 1991. In general terms, the solid waste provisions in the water and soil plan and coastal plan have been working well [2]. While some changes are suggested to improve environmental performance and make the plan more user-friendly, it is recommended that large portions of these provisions are carried through to the new regional plan.

Clean fill

The key issues for the management of clean fill are the management of sediment discharges and land stability. These issues are very similar to the issues for earthworks. The key question this report asks and tries to answer in relation to clean fill management is should clean fill be managed as a stand-alone activity, as it is in the water and soil plan or should it be managed as part of the earth works provisions.

The report concludes that clean fill and earthworks should be managed as separate activities with well aligned provisions for sediment control and land stability.

Small scale	Large scale
Permitted - up to 5000 square metres	Discretionary -More than 5000 square metres

Bio-solids

Bio-solids refers to solid waste from wastewater treatment plants. Bio-solids are sewerage sludges or sewerage sludges mixed with other materials that have been treated and/or stabilised. They can have have significant fertilising and soil conditioning properties as a result of the nutrients and organic materials they contain. Some bio-solids may also contain toxic, persistent and bio-accumulative heavy metals and trace organic compounds with the potential to accumulate in animals, and ultimately humans, via the food chain.

1 *Section 15 Resource Management Act 1991.*

2 *Regional Plan Review – topic summary Hazardous Substances.*

This report looks at two options for managing the discharge of bio-solids to land. Option A requires resource consent to be granted for any bio-solid discharge. Option B provides for highly treated (grade Aa) bio-solids to be discharged to land as a permitted activity and requires resource consent to discharge bio-solids of a lesser standard.

The report concludes that Option A is the preferred method to manage the discharge of bio-solids.

Aa grade	Other
Discretionary	Discretionary

On-site waste disposal

On-site waste disposal is currently a permitted activity and as such it is not actively monitored. As a result, council has little knowledge of the effectiveness of the current planning regime or the environmental effects current rural waste practises are having. With that being said council only receives a very small number of complaints about on-site waste disposal. These complaints generally relate to a breach of the permitted activity standards.

This report looks at an array options for managing on-site waste disposal from retaining the current permitted activity (option A) status through to requiring resource consent as a controlled activity (option B) or a discretionary activity (option C) for all on-site waste disposal.

The preferred option is to roll over the permitted activity status. This option manages environmental effects by controlling the location of the disposal site and the volume of waste that can be disposed.

Option	Activity Status
Option A	Permitted

Compost

Composting reduces the volume of waste being sent to landfill, extends the life of our existing landfills and reduces the amount of leachate they produce. Furthermore, compost can complement the use of fertilisers and enhance productivity, and soil conditioners and mulches also help to improve soil properties.

While composting has a number or benefits, there are negative effects such as dust, odour, leachate and stormwater run-off. The potential for negative effects increases with the scale of the operation [(3)].

Two options are considered. The first being to have no specific rules for the management of compost activities. This is the approach taken in the water and soil plan, where domestic composting is a permitted activity and commercial composting is a discretionary activity. Option 2 makes commercial and domestic composting a permitted activity. This option is tiered based on scale. More stringent permitted activity standards are in place for large-scale composting to recognise the increased environmental risk.

Option 2 is the preferred approach because it encourages composting while managing the environmental risks.

Small Scale	Large Scale
Permitted	Permitted

3 *Waste Management Institute of New Zealand, Consenting Guide for Composting Operations in New Zealand , 2009.*

Waste transfer stations

Waste transfer stations are facilities for the temporary storage and sorting of municipal waste, materials for recycling and green waste. Three options were assessed ranging from making the the activity permitted to making it a discretionary activity. The preferred option is Option B – middle of the road approach. It is recognised that waste transfer stations provide a public service which has important economic, social and environmental benefits. It is also recognised that there is potential for environmental damage to occur if contaminants from these sites enter water. Option B strikes a balance. Council must grant resource consent for waste transfer stations under option B but it enables council to assess the environmental risks and put conditions in place to manage them.

Option	Activity Status	Key Policy Approach
Option B: middle of the road approach.	Controlled.	• Recognise waste transfer stations provide an essential public service but that discharges to the environment are likely. Assess the risks and management options through the resource consent process. • Avoid significant adverse effects on water quality

11.3.2 Relevant provisions

This section is the evaluation supporting the following Regional Plan provisions:

- Policy D.4.9 – Discharges from landfills
- Rules C.4.6 .1 - C.4.6.7– Solid waste activities
- Rules in C.4.7 - Biosolids

11.3.3 The problem, opportunity and/or requirement

Northland produces around 65,500 tonnes (excluding Kaipara district) of municipal solid waste and an unknown quantity of rural waste each year. All this waste needs to be dealt with in one way or another, whether it be re-used, recycled or disposed of in other ways.

If waste is not disposed of properly it can have serious, lasting effects on people and the environment. The impacts of poor waste management are known to degrade surface and groundwater as well as contaminating land. Flow on effects of these discharges have the potential to degrade ecological values of adjoining water bodies, impact down stream water users and reduce the options for future uses of the dump site.

The regional council is responsible for managing discharges to the environment [4] including discharges to water from solid waste activities and discharges of solid waste to land where a discharge may enter water.

In this report the term solid waste is used to refer collectively to landfill, bio-solid, clean fill, managed fill, waste transfer and composting activities. Each activity has its own opportunities and issues, which are described below.

Landfill

The existing discretionary status for landfills (municipal, trade and industrial) is working well [5].

Note: The feedback council has received to date indicates that the landfill rules should be retained in the new regional plan. Therefore it is proposed that the rules for closed landfills as well as rules for existing and new landfills are carried through to the new regional plan. A detailed assessment of alternatives is not necessary.

4 *Sections 15 and 30 Resource Management Act 1991.*

5 *Regional Plan Review – topic summary Hazardous Substances.*

While no changes are proposed to the landfill provisions the policies and standards for discharges of contaminants (including discharges from landfills) to water are likely to change between the Operative Water and Soil Plan for Northland 2004 ('the water and soil plan') and the New Regional Plan. The revised water quality policies and standards are discussed in the 4 'Water quality' section of this report.

Bio-solids

Bio-solids refers to solid waste from wastewater treatment plants. Bio-solids are sewerage sludges or sewerage sludges mixed with other materials that have been treated and/or stabilised.

The application of biosolids to land presents an opportunity and risks. They can have significant fertilising and soil conditioning properties as a result of the nutrients and organic materials they contain. Some bio-solids may also contain toxic, persistent and bio-accumulative heavy metals and trace organic compounds with the potential to accumulate in animals, and ultimately humans, via the food chain [6]. Bio-solids present both an environmental/human health risk and an opportunity. The risk is dependent on the level of treatment. Highly treated Aa grade bio-solids present very little risk[7].

The key to managing risk from biosolids is ensuring that the biosolids are consistently treated / processed to minimise the risk of pathogens and environmental contaminants. The *Guidelines for the safe application of biosolids to land in New Zealand, 2003* a quality mark and auditing system that could be applied nation wide. Unfortunately this system did not take hold and there is no national system to ensure the quality of biosolids.

In our view, the quality of biosolids and the ability to consistently achieve that quality is the most important consideration when allocating an activity status for the discharge of biosolids in the new regional plan. Given that there is no nationally recognised system for assessing and reporting on the quality of biosolids we are unable to state with any confidence that biosolids can be applied to land without having adverse effects on peoples health or the environment. *For that reason it is recommended that the application of biosolids are assessed on a case by case basis through the resource consent process.*

Clean fill

Small-scale clean fill (less than 1000m^3) is a permitted activity in the water and soil plan with larger-scale clean fill operations requiring resource consent as a discretionary activity. The general consensus of stakeholder discussions and discussions within council during the review of the water and soil plan[8] was that clean fill provisions should be included in the new plan, that they should be as permissive as possible and reflect the low risk that this type of waste poses to the environment. A number of issues were also identified with the current approach:

1) There is a need to manage sediment on clean fill sites to avoid discharges of sediment to water bodies, however, the requirement to do this in the operative water and soil plan is unclear.
2) The volume-based thresholds, for example, 1000m^3, can be difficult to measure. This is an issue for the site operator and for council monitoring staff.
3) Site stability – location (slope, soil type and the presence of surface or ground water) of clean fill dumps is one factor contributing to instability. Monitoring of clean fill sites has also identified the presence of vegetation and woody material as a cause of clean fill instability. In a number of cases rotting vegetation has caused subsidence of clean fills several years after they have been closed. Instability presents a water quality issue as it can result in the discharge of sediment to waterways.
4) There has been some confusion around when clean fill rules apply and when earthworks rules apply. In many respects clean fill and earthworks are very similar. They have similar issues and require many of the same controls to safeguard the environment. In the operative water and soil plan they have different permitted activity thresholds and different performance standards. This has caused some confusion for staff and applicants.

At the stakeholder meetings held in 2015 the proportion of vegetation permitted in clean fill was identified as an important issue. The current threshold is zero, that is, no vegetation. This is consistent with the ministry's clean fill guidance. However, in practise a zero threshold is very difficult to achieve, especially when dealing with slip material. Slip material in Northland

6 *Guidelines for the safe application of biosolids to land in New Zealand, 2003*
7 *Guidelines for the safe application of biosolids to land in New Zealand, 2003.*
8 *Regional Plan Review – topic summary Hazardous Substances*

contains up to 15% vegetation[9] , which tends to be mixed throughout. While the bigger pieces of vegetation can be removed easily smaller pieces are more difficult, time consuming and costly. The benefit of removing all vegetation was questioned by stakeholders.

There are two main issues with vegetation in fill. Firstly, it can cause slipping and slumping and subsequent sediment discharges as branches, trunks and stumps decompose. Secondly, vegetation that decomposes when it is buried in fill can generate leachate. This is normally only an issue when large amounts of vegetation are buried.

Managed fill, mono-fill, construction and demolition waste

Discussion with stakeholders suggested that council could be more business friendly. One of the ways stakeholders suggested we could do this is by providing a range of landfill options so businesses have an alternative to disposing of waste at municipal landfills, which is a relatively expensive way to dispose of waste. Managed fill, mono-fill and construction and demolition landfills can cater for waste that poses less risk to the environment. Because the environmental risk is lower, fewer environmental controls are required and theoretically they should be more cost effective when compared to a municipal landfill.

However, we are not aware of any of these landfills operating in Northland.

Transfer stations

The limited monitoring data council has on stormwater quality from waste transfer stations indicates that contaminants in storm water run-off are at concentrations that may have an effect on ecosystem health. The data collected to date shows elevated levels of zinc, copper and lead in stormwater from waste transfer stations. This data was sourced from the one site that Northland Regional Council Monitors. Data collected from one site is not sufficient to draw conclusions that can be applied to transfer stations region wide.

The lack of data on the environmental impact of this activity has a strong link the its permitted activity status in the operative Water and Soil Plan. Northland Regional Council has generally not invested in regular monitoring of permitted activities. This is in part due to the understanding that permitted activities generally present a low risk to the environment and the in ability for council to recover costs for monitoring permitted activities.

Data was sought from other regional councils in an attempt to fill the information gap. Only Bay of Plenty Regional Council was able to provide data. This data is consistent with monitoring undertaken in Northland.

Work in this area has indicated two key issues;

1) A lack of data on the impact of this activity on water quality, and

2) That waste transfer stations have greater potential for adverse effects on the environment than previously thought.

Rural waste

In Northland and in most other regions of New Zealand, rural waste is disposed of on-site as a permitted activity. Recent research undertaken in the Waikato, Bay of Plenty[10] and Canterbury [11] regions indicates that common rural waste practises do not comply with the permitted activity rules in their respective regional plans.

Subsequent phases of the project identify environmental risks and possible interventions. The key environmental effects of current waste management practices on farms are;

- bioaccumulation/build up of contaminants in the ecosystem;
- leaching of soil contamination into groundwater and nearby waterways;
- quantities of wastes produced, particularly chemical wastes in dairy and horticultural activities; and
- the release of toxic gases from burning of wastes.

9 *Broad spectrum Dargaville, 2015*

10 *Rural waste surveys data analysis - Waikato and Bay of Plenty.*

11 *Non-natural rural wastes - site survey data analysis: Summary Report.*

A lack of waste minimisation options was also identified as a major barrier to improving waste minimisation in rural areas. The major outcomes from this piece of work is to trial several non-regulatory waste recovery projects. These interventions aim to work with farmers to redirect rural waste rather than changing rules or focusing on enforcement.

On-site waste disposal is currently a permitted activity and as such it is not actively monitored.This is in part due to the understanding that permitted activities generally present a low risk to the environment and the in-ability for council to recover costs for monitoring permitted activities. As a result, council has little knowledge of the effectiveness of the current planning regime or the environmental effects current rural waste practises are having. If the rural waste practises observed in other regions are occurring in Northland, which appears to be a reasonable assumption, then the existing permitted activity standards are not likely being met in a large number of cases.

Compost

Composting reduces the volume of waste being sent to landfill, extends the life of our existing landfills and reduces the amount of leachate they produce. Furthermore, compost can complement the use of fertilisers and enhance productivity, and soil conditioners and mulches also help to improve soil properties.

While composting has a number or benefits, there are negative effects such as dust, odour, leachate and stormwater run-off. The potential for negative effects increases with the scale of the operation [(12)].

If the new regional plan does not contain rules permitting (or otherwise controlling) composting, all composting activities will be captured under section 15(1) of the RMA and therefore requires resource consent (discretionary activity).

11.3.4 Management options

This section summarises the management options for solid waste management. The intention is not to identify every different combination of approach as there would be many, but to represent the range of options and highlight key differences in approaches.

There are some provisions in the current Regional Water and Soil Plan that we don't think need changing and are unlikely to be contentious. Also, there are some new provisions we think are obvious for the new Regional Plan. The following is a list of these uncontentious and obvious provisions that will be implemented regardless of the option selected:

- Landfill; and
- Closed landfill.

Landfill and closed landfill provisions (discretionary and permitted activities respectively, provided performance standards are complied with) in the water and soil plan have been working well [(13)]. It is proposed to carry these through to the new regional plan.

On-site waste disposal is currently a permitted activity and as such it is not actively monitored. As a result, council has little knowledge of the effectiveness of the current planning regime or the environmental effects current rural waste practices are having.

Clean fill

Option A: status quo

Overview: this option encourages small-scale clean filling through a permitted activity status with minimal environmental controls. Larger-scale clean filling activities are more tightly controlled, requiring resource consent as a discretionary activity. This allows councils to assess the risks of proposed large-scale clean fill activities and put conditions in place to manage any environmental effects.

Background:this option is drawn from the operative Regional Water and Soil Plan.

12 *Waste Management Institute of New Zealand, Consenting Guide for Composting Operations in New Zealand , 2009.*

13 *Regional Plan Review – topic summary Hazardous Substances.*

Small-scale	Large-scale
Permitted – less than 1000m^3 per year.	Discretionary – above 1000m^3 per year.

Option B: manage clean fill as a subset of earthworks

Overview: there are a number of similarities between clean fill and earthworks. This option seeks to package clean fill activities within earthworks. Under this option the permitted activity threshold would increase to 5000m^3 per year unless the activity is taking place within a flood plain or other sensitive area. In addition to the amount of waste that can be deposited, this option restricts they type of waste that can be disposed of an requires operators to have sediment controls in place at all times.

*Background:*this option has been suggested by staff to reduce the overlap between earthworks and clean fill rules.

Small-scale	Large-scale
Permitted – up to 5000 m^3.	Discretionary – above 5000m^3 per year.

Bio-solids

Option A: status quo

Overview: this option manages all classes of bio-solids through the resource consent process. It recognises that some classes of bio-solid can have negative human health and environmental impacts.

Background: this option is drawn from the operative Regional Water and Soil Plan.

Aa grade bio-solids	Other bio-solids
Discretionary.	Discretionary

Option B: tiered approach

Overview: this option recognises that bio-solids present different environmental and human health risks depending on how they are processed. It differentiates between Aa grade bio-solids, which have been treated to a very high level, and other levels of bio-solid. Where the risk is low this option encourages the use of bio-solids as a soil conditioner by applying a permitted activity status. Where there is some risk this option takes a more cautious approach and uses the resource consent process to assess and manage these risks.

Aa grade of bio-solids presents a low risk to the environment because they are certified as having a low heavy metal content and have been treated to kill human pathogens.

Other grades of treatment can also be applied to land, however the risks are higher.

*Background:*this approach is used in the Auckland Unitary Plan and the Proposed Wellington Natural Resources Plan.

Aa grade bio-solids	Other bio-solids
Aa class – permitted.	Discretionary

Compost

Option A: status quo

Overview: this option permits small-scale (home and farm) composting in recognition of the activities' limited environmental risk. Larger-scale composting requires resource consent as a discretionary activity because risks to the environment from composting increase as the scale of the operation increases.

*Background:*the option has been taken from the operative Regional Water and Soil Plan for Northland

Small-scale	Large-scale
Permitted.	Discretionary.

Option B: tiered approach

Overview: this option encourages composting in Northland by applying a permitted activity status to both home-scale and industrial-scale composting. While they are both permitted activities, more stringent performance standards apply to industrial/large-scale composting in recognition that environmental risk increases and the scale of the operation increases.

Background: this option has been proposed by Greater Wellington Regional Council in its Proposed Natural Resources plan.

Small-scale	Large-scale
Permitted.	Permitted.

Waste transfer stations

Option A: status quo

Overview: the rules in the operative water and soil plan treat waste transfer stations as a permitted activity provided there is no direct discharge of contaminants to water. If a discharge to water occurs then resource consent is required.

Background: this option is drawn from the operative Regional Water and Soil Plan.

New transfer stations	Re-consenting existing transfer stations	Policy approach
Permitted.	Permitted	Take a permissive approach unless contaminants are discharges to water.

Option B: middle of the road

Overview: this option requires resource consent for all waste transfer stations. It recognises that these activities have potential to cause discharges of contaminants to surface and ground water. The resource consent process is used to ensure that environmental effects are assessed and methods are put in place to manage those effects. Resource consent must be granted in this scenario but conditions can be put in place to manage environmental effects and council can monitor the sites (monitoring costs are recoverable).

*Background:*this option was suggested by staff.

New transfer stations	Re-consenting existing transfer stations	Policy approach
Controlled.	Permitted	Recognise waste transfer stations provide an essential public service but that discharges to the environment are likely. Assess the risks and management options through the resource consent process.

Option C: hardline

Overview: like option B, this option requires resource consent for all waste transfer and green dump activities. Unlike option B this option allows council to decline the resource consent. Council may wish to do this if the site is unsuitable or if the environmental effects are otherwise considered to be unacceptable. Once a trancefer station is established replacing a resource consent will be a controlled activity.

Background: this option was suggested by staff.

New transfer stations	Re-consenting existing transfer stations	Key policy approach
Discretionary	Discretionary.	Policy approach would be similar to option B but council would have the ability to decline resource consent applications.

Note: non-complying and prohibited activity statuses have not been assessed because staff do not believe that level of control is consistent with the public benefit provided by waste transfer stations or the level of risk they present to the environment.

On-site / farm landfills

Option A: Permissive

Overview: This option is based on the operative Regional Water and Soil Plan. Under this option new and existing farm landfills would be permitted activities provided that conditions around maximum volume, setbacks from waterways and conditions to control nuisance effects such as wind blown refuse. Where conditions are not able to be met resource consent is required, as a discretionary activity to asses environmental effects.

Background: This option was taken from the Operative Regional Plan with minor changes to some of the permitted activity conditions.

Landfills meeting conditions	landfills unable to meet conditions
Permitted	Discretionary

Option B: Middle of the road

Overview: This option gives council greater control over the establishment of new farm landfills and the re-consenting of existing farm landfills. While council would have to grant resource consent it allows council to impose conditions to manage environmental effects. It would also allow council to record the location of the landfill and recoup costs for monitoring.

Background: This option was suggested by staff as one way to address councils lack of information on farm landfills.

Landfills meeting conditions	landfills unable to meet conditions
Controlled	Discretionary

Option C: Highly regulated

Overview: This is the most heavily regulated option council considered. Council requires resource consent, as a discretionary activity for all new and re-consented farm landfills. This activity status allows council a wide scope to consider effects and impose conditions to manage those effects. It also provides the opportunity for council to decline resource consents.

Background: This option is taken from submitters on the draft regional plan that seek tight control of farm landfills and want council to encourage farm waste to be taken to municipal landfills.

Landfills meeting conditions	landfills unable to meet conditions
Discretionary	Discretionary

11.3.5 High level objectives and measures

Section 32 requires an assessment of "*...the efficiency and effectiveness of the provisions in achieving the objectives...*". Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section Evaluation approach for more details.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. They signal a direction for where we want to head, without stating how far we go – that comes later (they are the beginnings of objectives).

Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against.

High level objective	Measure
Minimise adverse effects on water quality.	Likelihood of discharges affecting water quality: 1 = high risk of contaminants entering water. 2 = moderate risk – controls in place but there is some residual risk. 3 = low risk. 4 = very low risk of contaminants entering water.
Minimise regulatory costs for applicants.	Costs for an applicant to provide information to council and meet performance standards: 1 = very high costs. 2 = high costs. 3 = moderate costs. 4 = low costs.
Minimise enforcement and compliance costs for council.	Staff time responding to non-cost recoverable solid waste related incidents: 1 = very high costs. 2 = high costs.

High level objective	Measure
	3 = moderate costs. 4 = low costs.

Minimise adverse effects on water quality

The first objective is to minimise adverse effects associated with discharging contaminants from solid waste activities to water and the consequential effects on aquatic ecosystems and other water users.

The health of aquatic ecosystems and the health of other users of water, for example, human or stock drinking or recreating in water, can be reduced by contaminants. Effects vary depending on the contaminant, the quantities and the sensitivity of the receiving environment/user. Contaminants vary depending on the type of activity taking place and the mitigation measures in place. Typically the main contaminant we see from clean fill is sediment, while discharges from solid waste activities that deal with municipal waste are more likely to contain heavy metals, have a high biological oxygen demand and may also contain sediment.

We have used a constructed measure to assess whether the management options are likely to practicably control (avoid or mitigate) adverse effects in terms of over-allocation and impacts on other water users. A constructed measure has been used because it is very difficult to quantify the actual and potential adverse effects of any particular management option. This assessment is based on the likelihood of interventions being in place to manage or avoid discharges to water through resource consent conditions or permitted activity standards.

Minimise regulatory costs for applicants

This objective has been chosen because solid waste activities have the potential to provide significant benefits (primarily social and economic) to the region. The objective therefore looks to minimise costs for those carrying out the prospective activity. The objective recognises that there is a cost in terms of application fees and cost of preparing information to support an application. This will also reflect ongoing monitoring costs where a resource consent is required.

The scale of the measure therefore looks at the extent that costs are minimised. The scores range from 1 – significant cost, which could be viewed as a 'non-complying activity that is subject to full public notification, to 4 –low cost, where there are no resource consent costs but there may be some minor costs to meet permitted activity standards.

Minimise enforcement and compliance costs for council

This objective seeks to measure the financial burden an option places on council. It includes unrecoverable costs of staff time to undertake monitoring and takes any legal costs into account if an option is likely to be challenged. Where these costs are included, an option will score poorly, particularly where a rule is likely to be challenged legally because legal costs can be very high when compared to other monitoring costs. Conversely, where costs are recoverable an option will score well.

High level objectives not included

Section 32 requires an assessment of the impacts on economic growth and employment opportunities (s32(2)(a)). However, the impact of the management options on economic growth and employment opportunities cannot be perceived and/or determined with any confidence. Therefore, economic growth and employment opportunities have not been included as high level objectives. For more information go to the section *'1.7 'Assessing impacts on economic growth and employment opportunities' (which is in the introduction to this section 32 analysis).*

11.3.6 Evaluating the management options

Cleanfill

High level objective	Option A (status quo)	Option B manage as a subset of earthworks
Minimise adverse effects on water quality. *Measure* Likelihood of discharges affecting water quality: 1 = high risk of contaminants entering water 2 = moderate risk – controls in place but there is some residual risk 3 = low risk 4 = very low risk of contaminants entering water	2	3.5
Minimise regulatory costs for applicants. *Measure* Costs for an applicant to provide information to council and meet performance standards: 1 = very high costs 2 = high costs 3 = moderate costs 4 = low costs	3	3*
Minimise enforcement and compliance costs for council. *Measure* Staff time responding to non-cost recoverable solid waste related incidents: 1 = very high costs 2 = high costs 3 = moderate costs 4 = low costs	2	2

* While the resource consent costs for applicants will be lower because more fill can be placed before resource consent is required, more rigorous environmental controls are required. Overall, the costs for each of the two options will be similar.

A number of assumptions were made in this assessment of options A and B above:

1) That provisions will require;

a) clean fill to be placed above the winter groundwater table and be setback from water bodies;

b) clean fill operations to meet Ministry for the Environment waste acceptance criteria for clean fill[(14)] with the exception of criteria around the volume of vegetation;

c) the surface of clean fill be rehabilitated when no longer used;

d) clean fill will not be deposited in a floodplain; and

e) sediment controls will be in place.

2) The major discharge issue from clean fill operations is sediment entering water bodies.

3) The generation/discharge of leachate is secondary to the discharge of sediment and can be managed through waste acceptance criteria.

4) That discharges of any landfill, managed fill, clean fill or Bio-solid directly into water is not an acceptable practice.

Certainty about the evaluation

We're confident that evaluation is accurate enough to make a decision on the preferred option. We don't think it would be viable and/or worthwhile to get more information to increase the accuracy of our evaluation as it's unlikely to change the relative differences between the options.

Time-frame of the evaluation

The evaluation is made over the life-time of the plan (10-15 years).

The preferred management option

The preferred management option for the proposed Regional Plan is Option B:

In many cases there is little to no difference between clean fill operations and earthworks in terms of the activity and the environmental effects. This has caused some confusion in the past around when to apply the clean fill provisions and when to apply the earthworks controls. Each set of provisions has different permitted activity thresholds and different standards to manage environmental effects.

The key decision that needs to be made in respect to the management of clean fill is whether it can be adequately managed as part of the general earthworks rules and whether this will be more user friendly for people that use the regional plan.

Discussions with staff indicate that the preference is for clean fill to be packaged with the Solid Waste activities, but to ensure there is alignment with the earthworks rules and cross referencing to reduce confusion.

This approach balances an increased permitted activity volume with increased sediment controls. Overall, it is expected that this will result in better environmental outcomes than the status quo. There is a risk of non-clean fill material being disposed of as clean fill. Therefore it is recommended that the waste acceptance criteria are put in place and methods are in place to allow for auditing or monitoring dump sites. It is worth noting that this is a risk for both clean fill and earthworks.

The preferred option also includes an allowance for some vegetation to be mixed in with clean fill material. There are several Regional plans in other regions and the proposed National Environmental Standards for Plantation Forestry have thresholds of between 2%-10%. Staff believe that a threshold of 5% would be a more practical threshold for Northland that balances the risks and practicalities. It is envisaged that this would require trees, stumps and larger branches to be removed from fill but other vegetation could be disposed of as fill.

Waste transfer stations

High level objective	Option A	Option B	Option C
Minimise adverse effects on water quality. *Measure*	2	2-3	3

14 *Technical guidelines for the disposal to land of residual waste and other material (draft for consultation), 2012.*

High level objective	Option A	Option B	Option C
Likelihood of discharges affecting water quality: 1 = high risk of contaminants entering water 2 = moderate risk – controls in place but there is some residual risk 3 = low risk 4 = very low risk of contaminants entering water			
Minimise regulatory costs for applicants. *Measure* Costs for an applicant to provide information to council and meet performance standards: 1 = very high costs 2 = high costs 3 = moderate costs 4 = low costs	4	3	2
Minimise enforcement and compliance costs for council. *Measure* *Responding to complaints and monitoring compliance* 1 = very high costs 2 = high costs 3 = moderate costs 4 = low costs	4*	4	4

*Compliance costs are low because this permitted activity is not monitored unless complaints are received. If these sites were regularly monitored the costs to council would be much higher.

Certainty about the evaluation

There is always uncertainty about the potential impacts of management options.

The objectives and measures that we're least confident about the accuracy of are the environmental measures. This is because the monitoring data used to assess option one is based on limited data. In option two the measures taken to manage environmental effects will vary depending on the site. This assessment is based on staff experience rather than data and therefore only has a moderate level of certainty.

The information we have at this time provides an indication that some improvements in environmental performance may be required. While it would be helpful to get more information on this issue funding for this research is not available at this time. Therefore, we have made a recommendation based on the information we have available.

Time-frame of the evaluation

The evaluation is made over the life-time of the plan (10-15 years).

The preferred management option

The preferred option is option 2 – middle of the road approach. It is recognised that waste transfer stations provide a public service, which has important economic, social and environmental benefits. It is also recognised that there is potential for environmental damage to occur if contaminants from these sites enter water. Option 2 strikes a balance. Council must grant resource consent for waste transfer stations under option 2 but it enables council to assess the environmental risks and put conditions in place to manage them.

Options 1 and 3 could have been used however option seems to strike a better balance between causing inconvenience and regulatory cost to transfer station operators and the protection of water quality. Option one has low costs and low certainty around environmental protection. Option three has high regulatory costs and moderate to high likelihood of protecting water quality. However, the negligible increase in environmental protection does not justify the increase level of regulation and reduced certainty to transfer station operators.

Bio-solids

High level objective	Option A	Option B
Minimise adverse effects on water quality. *Measure* Likelihood of discharges affecting water quality: 1 = high risk of contaminants entering water 2 = moderate risk – controls in place but there is some residual risk 3 = low risk 4 = very low risk of contaminants entering water	3	3
Minimise regulatory costs for applicants. *Measure* Costs for an applicant to provide information to council and meet performance standards: 1 = very high costs 2 = high costs 3 = moderate costs 4 = low costs	3	4
Minimise enforcement and compliance costs for council. *Measure* *Responding to complaints and monitoring compliance*	4	3

High level objective	Option A	Option B
1 = very high costs 2 = high costs 3 = moderate costs 4 = low costs		

Certainty about the evaluation

There is always uncertainty about the potential impacts of management options however we are confident that evaluation is accurate enough to make a decision on the preferred option. We don't think it would be viable and/or worthwhile to get more information to increase the accuracy of our evaluation as it's unlikely to change the relative differences between the options.

Time-frame of the evaluation

The evaluation is made over the life-time of the plan (10-15 years).

The preferred management option

The preferred management option for managing bio-solid discharges to land to Option 1. Both the options scored very closely against the measures. However, the lack of certainty under option two in respect to operators consistently meeting the Aa grade means that council is inclined to take a precautionary approach by requiring resource consent for this activity. for that reason option 1 is preferred.

Compost

High level objective	Option A	Option B
Minimise adverse effects on water quality. *Measure* Likelihood of discharges affecting water quality: 1 = high risk of contaminants entering water 2 = moderate risk – controls in place but there is some residual risk 3 = low risk 4 = very low risk of contaminants entering water	4	4
Minimise regulatory costs for applicants. *Measure* Costs for an applicant to provide information to council and meet performance standards: 1 = very high costs 2 = high costs 3 = moderate costs 4 = low costs	3	4

High level objective	Option A	Option B
Minimise enforcement and compliance costs for council. *Measure* *Responding to complaints and monitoring compliance* 1 = very high costs 2 = high costs 3 = moderate costs 4 = low costs	4	3

Certainty about the evaluation

We're confident that evaluation is accurate enough to make a decision on the preferred option. We don't think it would be viable and/or worthwhile to get more information to increase the accuracy of our evaluation as it's unlikely to change the relative differences between the options.

Time-frame of the evaluation

The evaluation is made over the life-time of the plan (10-15 years).

The preferred management option

Option 2 is the preferred approach because it encourages composting while managing the environmental risks. One of the costs of implementing the preferred option is that costs to regional council for monitoring compliance with the permitted activities (as shown in option 2) is higher than where resource consent is required (option 1) because resource consent monitoring costs are recoverable.

On-site / farm landfills

High level objective	Option A	Option B	Option C
Minimise adverse effects on water quality. Measure Likelihood of discharges affecting water quality: 1 = high risk of contaminants entering water 2 = moderate risk – controls in place but there is some residual risk 3 = low risk 4 = very low risk of contaminants entering water	2	2.5	2.5
Minimise regulatory costs for applicants. *Measure* Costs for an applicant to provide information to council and meet performance standards:	4	3	3

High level objective	Option A	Option B	Option C
1 = very high costs 2 = high costs 3 = moderate costs 4 = low costs			
Minimise enforcement and compliance costs for council. *Measure* *Responding to complaints and monitoring compliance* 1 = very high costs 2 = high costs 3 = moderate costs 4 = low costs	3.5	4	4

Certainty about the evaluation

There is always uncertainty about the potential impacts of management options.

The objectives and measures that we're most confident about the accuracy of are enforcement and regulatory costs for applicants. As a permitted activity we know that the regulatory costs for the applicant are low. We also know that enforcement and compliance costs for council tend to be higher for permitted activities because the cost of staff time can not be recovered. Monitoring and enforcement of permitted activities tends to be triggered by complaints. In this case there have only been a handful of complaints about farm landfills so we know council's costs are relatively low.

The objectives and measures that we're least confident about the accuracy of are the environmental effects. Because the sites are not regularly monitored we do not know if these landfills are appropriately sited, managed or if they are having environmental effects. Assumptions have been made in this assessment that unmonitored sites are likely to have more non-compliance than monitored sites and that council will monitor more regularly if monitoring costs are recoverable as they are where resource consents are in place.

Time-frame of the evaluation

The evaluation is made over the life-time of the plan (10-15 years).

The preferred management option

The evaluation of management options revealed very little difference between the total scores. Option A (status quo) scored slightly lower as there is a slightly greater risk to the water quality and slightly more costs incurred by council. While the conditions in place to manage effects on water quality will be similar across the options there is a greater risk of non-compliance where activities are undertaken as a permitted activity when compared to activities that are consented. The score is slightly lower to reflect this.

At first glance it would be reasonable to expect a more marked difference between the options in respect to the measure for minimising councils because under options B and C all costs are recoverable and under option A costs are not recoverable. The small change in score reflects the small number of incidents / complaints council receives on an average year.

Given there no clear differences in costs between the options our preference is to carry through the status quo to the new regional plan. Retaining a permitted activity is consistent with other largely rural regions such as Canterbury, Waikato and Bay of Plenty.

11.4 Hazardous substances and contaminated land

11.4.1 Executive summary

This section evaluates the options for managing hazardous substances in the new Regional Plan.

The activities considered in this section include the discharge of hazardous substances to land or water and the management of land contaminated by hazardous substances. The management of vertebrate control chemicals, is also included within this report. Vertebrate control chemicals have been treated as a separate package because of the specific opportunities and issues their use presents.

Agrichemical discharges have been assessed in the 7.4 'Spray' section of the Air Quality section 32 analysis and therefore have not been considered in this report.

Contaminated land

The Resource Management Act 1991 (RMA) provides the basis for the management of contaminated land in New Zealand. It is the primary statute for the development of the proposed Regional Plan provisions for contaminated land and hazardous substances.

Land can become contaminated when hazardous substances are used, stored or disposed of in an unsafe manner. Contamination is not always limited to a specific site. Hazardous substances may seep through the soil into groundwater, or be carried to nearby land and waterways, in rainwater or as dust. Gasses emitted from contaminated land may also cross property boundaries and may pollute air. The past use of hazardous substances in industry, agriculture and horticulture has left a legacy of soil contamination in Northland. This contamination has been mainly caused by past practices in which chemicals were used, stored and disposed of in a way that is not considered safe by today's standards.

Three options were considered for the management of contaminated land ranging from a hard-line option that would require all contaminated land to be remediated to an option that expressly provides for contamination to stay in the ground in some circumstances. Option 3 is the preferred package to manage contaminated land in Northland. It provides a balance between environmental risk and the cost of remediation while encouraging investigation into potentially contaminated sites.

Site investigation	Allow contamination to stay in the ground	Remediation	Policy approach
• Permit - site investigation • Control - bore construction	• permitted– provided a site investigation is provided to council and contamination is not mobile. • Discretionary – if contamination is mobile or has more than minor off site effects.	• permit - Small scale 'dig and dump' remediation • Discretionary - Other remediation	• No contaminated land specific policy • Policy guidance provided through policies on water quality. • Guidance on remediation and site management provided through national guidelines

Hazardous substance

Hazardous substances are controlled under the Hazardous Substance and New Organisms Act 1996 and the Resource Management Act 1991. The Hazardous Substance and New Organisms Act is the primary legislation designed to manage hazardous substances across their life cycle (that is, import/manufacture, transport, storage, use and disposal).

The controls under the hazardous substances act are substance-specific and are based on the particular hazardous properties of the substance. The controls apply anywhere, any time to a given substance classified as hazardous under the Act.

Controls under the Resource Management Act may also be appropriate to manage environmental risks, particularly where hazardous substances will be used around sensitive receiving environments.

This report includes options to manage risks from the discharge of hazardous substances to water or to land where it may enter water.

Two options were considered to manage hazardous substance discharges. The key differences between the options is that option 1 requires consent of all hazardous substances that are not managed by another rule in the regional plan e.g agrichemicals and dust suppressants. Option 2 provides for the discharge all hazardous substances not managed by other rules in the regional plan provided the conditions imposed by the Environmental Protection Authority are adhered to.

The preferred management option is option 1 because it strikes a balance between environmental protection and costs to applicants and land owners.

Discharge to land	Discharge directly to freshwater	Discharge to the Coastal Marine Area	Key policy approach
• Discretionary - other hazardous substances not managed through a permitted, controlled or restricted discretionary rule in the plan.	• Discretionary - other hazardous substances not managed through a permitted, controlled or restricted discretionary rule in the plan.	• Discretionary - other hazardous substances not managed through a permitted, controlled or restricted discretionary rule in the plan.	• Best practice is used to avoid accidental discharges. • Avoid significant adverse effects on; 1) Human health; 2) Drinking water for human and stock; and 3) Water quality.

Vertebrate Toxic Agents

Vertebrate control chemicals are used to control animal pest species. While 1080 is the most high profile vertebrate control chemical used in Northland, the controls in the operative plans and the new regional plan apply to a variety of pesticides.

On 1 April 2017 the government released new regulations governing Vertebrate toxic agents. The regulations provide that three vertebrate toxic agents (VTAs)–sodium fluoroacetate (1080), brodifacoum, and rotenone –plus any associated pre-feed or repellent are exempt from s15. Fora discharge to be exempt from s15, it must comply with certain limits, and the operator responsible for the discharge must provide certain information to regional councils.

Given the regulations control the use of –sodium fluoroacetate (1080), brodifacoum, and rotenone. This report and the resulting regional plan provisions focus on the use of other vertebrate toxic agents and the use of –sodium fluoroacetate (1080), brodifacoum, and rotenone where the controls specified in the Resource Management (Exemption) Regulations 2017 can not be met.

The existing rules differentiate between ground-based and aerial application of vertebrate control chemicals, with fewer controls being applied to ground-based methods. Feedback received to date indicates that this approach is working well and should be carried through into the new regional plan. The key reason cited by stakeholders for retaining this approach is that ground-based application allows for accurate placement of the substance and there is less risk of it getting into water.

The operative Regional Water and Soil Plan for Northland exercises more control for aerial application of vertebrate control chemicals. This is because aerial applications are generally of a greater scale than ground-based application and there is an increased risk to the substance entering water.

All the options considered include controls for aerial and ground-based application methods. Given the positive feedback council has received in relation to the current ground-based application rules, the key differences illustrated between the options are the level of control placed on aerial application of vertebrate control chemicals. In particular, how we deal with incidental discharges to water.

Option 3 is the preferred package to manage contaminated land in Northland. It provides a balance between enabling aerial pest control in Northland, managing the environmental effects of the discharge and recognising that there is some community concern around aerial application.

Discharges to land	Discharges to Water	Key Policy Approach
• Permitted – ground-based. • Controlled – aerial applications to land.	• Discretionary	• Provide for uses of hazardous substances where its use is unlikely to have significant environmental effects including contaminating land. • Encourage best practice for use and storage of hazardous substances in the coastal marine area.

11.4.2 Relevant provisions

This section is the evaluation supporting the following Regional Plan provisions:

- Rules C.6.5.3 - C.6.5.5 - Vertebrate Toxic Agents
- C.6.8.1 - C.6.8.4 - Contaminated Land
- Rules C.6.9.1 - Discharge of dust suppressants
- Rules C.6.9.7 - Other discharges
- Policy - D.4.10 – Discharge of hazardous substances to land or water.

11.4.3 The problem, opportunity and/or requirement

Contaminated land is defined under the Resource Management Act 1991 (RMA) to mean land with hazardous substances in or on it that are reasonably likely to have significant adverse effects on the environment, including human health.

A 'contaminant' is defined in section 2 of the Hazardous Substances and New Organisms Act 1996 as a hazardous substance.

Contaminated land

Land can become contaminated when hazardous substances are used, stored or disposed of in an unsafe manner. Contamination is not always limited to a specific site. Hazardous substances may seep through the soil into groundwater, or be carried to nearby land and waterways in rainwater or as dust. Hazardous gases can also pollute the air. The past use of hazardous substances in industry, agriculture and horticulture has left a legacy of soil contamination in Northland. This contamination has been mainly caused by past practises in which chemicals were used, stored and disposed of in a way that is not considered safe by today's standards.

Contaminated sites are commonly associated with past activities such as:

- Use of pesticides – these activities may have resulted in contamination at locations where pesticides were/are used.
- Production, storage and use of petroleum products – contamination has occurred from leaking fuel storage facilities at tank farms and service stations.
- Timber treatment – pentachlorophenol (PCP) was one of a number of chemical formulations used routinely at most sawmills and timber treatment plants from the 1950s until 1988, when its use ceased.
- Sheep dipping – from use of DDT, dieldrin, arsenic and other chemicals to treat parasites on sheep. Old sheep dips can be located on farms with a history of sheep farming, as well as on public land used at the time as stockyards and railway sidings. Many of these activities – for example, the use of dieldrin in sheep dips and to kill insects in the 1940s to the 1960s – were not considered to be hazardous at the time.

People, animals and the environment can be exposed to hazardous substances on contaminated land by:

- Direct contact with, including through ingestion of, contaminated soil;
- Swallowing food or water from contaminated environment; and
- Breathing vapours or contaminated dust.

As well as endangering health, these substances can:

- Limit the use of land;
- Cause corrosion that may threaten building structures; and
- Reduce land value.

As land is developed, it is important to know where contaminated land is located so that people are not exposed to contaminants that may affect their health. To assist with identifying potentially contaminated land, the Ministry for the Environment has compiled a list of activities and industries commonly associated with contaminated land. This list is called the Hazardous Activities and Industries List (HAIL). The Northland Regional Council uses the HAIL to identify potentially contaminated sites. Further investigation of an individual site is required to determine whether the site is contaminated.

Hazardous substances

Hazardous substances are substances which present a danger to people and the environment due to their chemically reactive, explosive, flammable, corrosive, toxic, eco-toxic or disease-causing nature. A variety of substances fall into this category including fuels, pesticides, metallic products (for example, copper used in timber treatment) and liquid waste produced in landfills (leachate).

While hazardous substances are defined in Part 2 of the Hazardous Substances and New Organisms Act 1996 (this definition is also referred to in the Resource Management Act), the thresholds for determining whether a substance has hazardous properties are set out in the Hazardous Substances (Minimum Degrees of Hazard) Regulations 2001. The regulations closely follow the United Nations Globally Harmonised System of Classification and Labelling (GHS). The GHS is an internationally agreed upon system created by the United Nations. (Note that any one substance can trigger more than one hazardous property threshold.)

Hazardous substances are commonly used throughout Northland and are an important contributor to our economic and social well-being. Hazardous substances can be found in most homes and businesses. Things like household cleaners, paints, solvents and petrol are hazardous substances. Generally speaking, small volumes of hazardous substances like those that you find at home present a low risk to the environment. However, as the volumes increase the environmental risk becomes more significant and greater controls may be necessary to manage these risks.

This evaluation assess the management options for:

- The discharge of hazardous substances land and water;
- The storage of hazardous substances in the coastal marine area; and
- Management of land contaminated by historic activities.

This evaluation does not include:

- Subdivision or change of use on contaminated land (addressed by district plans);
- The use, storage, and transport of hazardous substances on land (functions repealed by the Resource Legislation Amendment Act 2017; and
- Burning hazardous substances (covered by the 7.5 'Smoke' section 32).

The Regional Water and Soil Plan has rules requiring resource consent for all discharges of hazardous substances to land or water (new and historic). Feedback from council staff and other stakeholders indicates that these rules work well where discharges are intentional, particularly where the discharge is part of day-to-day operation of a business [15]. The existing regime is seen as an appropriate mechanism to discourage hazardous substance discharges while providing an opportunity to discharge where environmental effects can be managed to an acceptable level.

15 *Regional plans review – topic summary | Hazardous substances.*

However, a 2014 review of the Regional Water and Soil Plan highlighted that the rules do not work as well for historic and passive discharges[16]. The plan is not clear if the provisions are only intended to apply to the initial discharge of hazardous substances to land or if it also applies to discharges of hazardous substances from contaminated land, that is, to water or across property boundaries.

This uncertainty has led to inconsistent application of the rules. This is an issue in terms of equity for applicants and increases the risk of negative environmental effects and legal implications for council.

Waste oil discharges to manage road dust

Over the past few years there has been a lot of discussion about managing the effects of road dust on the region's unsealed roads. Spreading waste oil on unsealed roads is often suggested as a cost-effective solution. This report does not consider the merits or costs of using waste oil as a dust suppressant because the practise is banned by the Environmental Protection Authority. The practise is know to have significant environmental and human health effects.

The discharge of vertebrate control chemicals

Vertebrate control chemicals are used to control animal pest species. While 1080 is the most high profile of the vertebrate control chemicals used in Northland, the controls in the operative plans and the new regional plan apply to a variety of pesticides.

The use of vertebrate control chemicals can be a controversial topic. The use of 1080 in particular has been the subject of a lot of debate in recent years and continues to evoke strong feelings by those that support its use and those that oppose it.

The existing rules differentiate between ground-based and aerial application of vertebrate control chemicals, with less control being applied to ground-based methods. Feedback received to date indicates that this approach is working well and should be carried through into the new regional plan. The key reason cited by stakeholders for retaining this approach is that ground-based application allows for accurate placement of the substance and there is less risk of it getting into water.

The operative Regional Water and Soil Plan for Northland exercises more control for aerial application of vertebrate control chemicals. This is because aerial applications are generally of a greater scale than ground-based application and there is an increased risk to the substance entering water. Aerial application of vertebrate control chemicals to land is a controlled activity however discharges of vertebrate control chemicals to water is a discretionary activity. Given the steep topography of the area that vertebrate control chemicals are applied to in Northland, and the number of small streams in those areas, resource consents for the discharge of vertebrate control chemicals tend be treated as discretionary activities.

In April 2017 the Resource Management (exemption) Regulations, 2017 came into force.These regulations are made under section 360(1)(h) of the Resource Management Act 1991 (RMA), which enables regulations that exempt contaminants from the requirements of s15of the RMA. Section 15 provides that no person may discharge a contaminant into the environment unless the discharge is expressly allowed by:□a national environmental standard or other regulations;□a rule in a regional plan; or□a resource consentThe regulations provide that three vertebrate toxic agents (VTAs)–sodium fluoroacetate (1080), brodifacoum, and rotenone –plus any associated pre-feed or repellentare exempt from s15. For a discharge to be exempt from s15, it must comply with certain limits, and the operator responsible for the discharge must provide certain information to regional councils.

In respect to including rules within the new regional plan around the use of VTA's the regulations mean that council can not include rules that relate to the use of odium fluoroacetate (1080), brodifacoum, and rotenone except where the controls of the regulations can not be met.

11.4.4 Management options

This section summarises the management options for managing the discharge of hazardous substances and contaminated land. The intention is not to identify every different combination of approach as there would be many, but to represent the range of options and highlight key differences in approaches.

16 *Regional plans review – topic summary | Hazardous substances.*

There are some provisions in the current Regional Water and Soil Plan that we don't think need changing and are unlikely to be contentious. Also, there are some new provisions we think are obvious for the new Regional Plan. The following is a list of these uncontentious and obvious provisions that will be implemented regardless of the option selected:

- Discharge of vertebrate control chemicals to the coastal marine area is a discretionary activity.
- That ground-based application to vertebrate control chemicals to land is permitted because of the low risk of it entering water and if it did enter water the low volume would present low risk to aquatic ecosystems;
- Sodium fluoroacetate (1080), brodifacoum, and rotenone are not considered below because they are regulated under Resource Management (Exemption) Regulations 2017

Vertebrate control chemical discharges

The options focus on use of vertebrate control chemicals to manage pests through aerial and ground-based methods. The key differences illustrated between the options are the level of control placed on aerial application where there is a risk of incidental discharge to water.

Option 1 – Status quo

Overview: this option places a low level of control where the vertebrate control chemical is unlikely to enter water and increases the level of control as the risk of the substance entering water increases.

Background: This approach is in place now in the operative Regional Water and Soil Plan. It was developed in the mid-1990s and became operative in 2004.

Discharge to land	Discharges water	Key policy approach
• Permitted – ground-based application to land. • Controlled – aerial applications to land. • Discretionary – aerial application to land where it may enter water.	• Discretionary.	• No direct policy guidance.

Option 2

Overview: Like Option 1, the level of control increases as the risk of vertebrate control chemicals entering water increases. The key differences being that council's control is restricted to imposing conditions to manage the risk. There is no option to decline applications to discharge vertebrate control chemicals to land. Policy encourages the use of best practice to reduce the environmental risks.

Background: This option is based on the Proposed Natural Resources Plan for Wellington.

Discharge to land	Discharge to freshwater	Key policy approaches
• Permitted - ground based • Controlled – aerial applications to land. Including incidental discharges to water.	• Discretionary.	• Provide for uses of hazardous substances where its use is unlikely to have significant environmental effects including contaminating land. • Encourage best practice for use and storage of hazardous substances in the coastal marine area.

Option 3

Overview: This option allows for the discharge of vertebrate control chemicals to land via aerial application as of right. Conditions are in place to manage this activity.

*Background:*This option is based on the West Coast Regional Land and Water Plan 2014.

Discharge to land	Discharge to freshwater	Key policy approaches
• Permitted – applications to land, both ground based and aerially, where it may enter water.	• Discretionary – application to water.	• Same as option 2.

Management of contaminated land

The options focus on the management of contaminated land. The key differences illustrated between the options are whether or not contamination can stay in the ground. Options 1 and 3 provide for contamination to stay in the ground in some circumstances but option 2 requires contamination to be remediated.

Option 1 – Status quo

Overview: Option 1 is the current approach, where the discharge, or proposed discharge, of hazardous substances to the environment (other than agrichemicals and vertebrete toxic agents) requires a resource consent . If hazardous substances are discharged to land or water without resource consent approval the rule is breached, which triggers enforcement which may involve remedial action.

*Background:*This option has been taken from the operative Regional Water and Soil Plan.

Site investigation	Allow contamination to stay in soil	Remediation	Key policy approach
• Site investigation – permitted • Bore hole construction on a contaminated site – Permitted	• Discretionary (no specific rule).	• Discretionary (no specific rule).	• Not applicable.

Option 2 – Conservative approach

Overview: This option enables monitoring and sampling to determine if land or water is contaminated. It also recognises that the construction of bore holes for testing contamination in groundwater can cause groundwater contamination if it is not managed properly.

Where contamination is present in soil this option requires the site to be remediated.

Background: This option is based on discussions with council technical staff.

Site investigation	Allow contamination to stay in soil	Remediation	Key policy approach
• Investigation excluding the construction of bore holes = permitted. • Bore hole construction on a contaminated site = restricted discretionary.	• Non-complying.	• Controlled.	• Encourage investigation of potentially contaminated sites. • Require remediation of all contaminated sites.

Option 3 – Middle of the road

Overview: This option enables testing of land to determine if soil is contaminated. It also recognises that the construction of bore holes for testing contamination in groundwater can cause groundwater contamination if it is not managed properly.

Where contamination is found in soil, this option provides for that contamination to remain in the soil provided it is not having significant effects beyond the site boundary.

*Background:*This option is based on the proposed Natural Resources Plan for Wellington and the decisions version of the Canterbury Land and Water plan, as well as feedback from council staff.

Site investigation	Allow contamination to stay in soil	Remediation	Key policy approach
• Permitted –investigation excluding the construction of bore holes. • Controlled – bore hole construction on a contaminated site.	• permitted– provided a site investigation is provided to council and contamination is not mobile. • Discretionary – if contamination is mobile or has more than minor off site effects.	• permit - Small scale 'dig and dump' remediation • permit - natural attenuation (see *allow contamination to stay in soil*) • Discretionary - Other remediation.	• No policy specifically on contaminated land. • Policy guidance provided through policies on water quality. • Guidance on remediation and site management provided through national guidelines

Discharge of hazardous substances other than vertebrate control chemicals and agrichemicals

The options focus on hazardous substance discharges that don't fit into the agrichemical or vertebrate control chemical classifications. The key differences illustrated between the options are the level of control applied by council. Another key difference between options 2 and 3 and the status quo (option 1) is that they are centred around a substance being approved by the Environmental Protection Authority.

Option 1 – Status quo

Overview: This option retains a high level of control over the discharge of hazardous substances to land and to water that are not regulated under other rules in the regional plan. Where discharges are to land, policy requires the use of best management practices to avoid accidental discharges and to avoid signficant adverse effects on human health, drinking water and water quality.

Background: This option is the approach is based on the operative water and soil plan and operative coastal plan.

Discharge to land	Discharge to fresh water	Discharges to the coastal marine area	Key policy approach
• Discretionary.	• Discretionary.	• Discretionary.	• Best practice is used to avoid accidental discharges. • Avoid significant adverse effects on; 1) Human health; 2) Drinking water for human and stock; and 3) Water quality.

Option 2 – permissive approach

Overview: This option used a low level of control for commonly used hazardous substances in recognition that controls are imposed on the use of hazardous substances as part of HSNO approval.

Background: Based on the decisions version of the Canterbury Land and Water Regional Plan 2013.

Discharge to land	Discharge to fresh water	Discharge to the coastal marine area	Key policy approach
• Permitted – The discharge of substances with HSNO Act approval to discharge to land.	• Permitted – The discharge of substances with HSNO Act approval to discharge fresh water.	• Permitted – The discharge of substances with HSNO Act approval to discharge to the coastal marine area.	• Best practice is used to avoid accidental discharges. • Avoid significant adverse effects on; 1) Human health; 2) Drinking water for human and stock; and 3) Water quality.

11.4.5 Screening the management options

Spreading used oil on land

In the past, used oil [17] has been spread on land to suppress dust. Although the current Regional Water and Soil Plan for Northland prohibits this activity because of its potential effects on human and environmental health, spreading of used oil regularly arises in discussions around managing road dust. Primarily because used oil is seen to be a cheap and effective dust suppressant.

The Hazardous Substances and New Organisms Act 1996 is the primary legislation for managing the import, use and disposal of hazardous substances in New Zealand. HSNO prohibits the import or manufacture of a hazardous substance unless it is done in accordance with an approval, which sets controls for the substance throughout its life cycle, such as requirements for storage, identification, emergency management and disposal.

In the case of used oil there are a number of avenues available to dispose of the substance including, exporting it as a waste, treating it so it is no longer hazardous, combustion in a managed incineration facility or depositing it in a land fill. Depositing/spreading used oil on land (including roads) is not an approved disposal method. Doing so would contravene the conditions of the approval and expose the spreader to enforcement action under HSNO. *Therefore the use of waste oil has not been considered as an option to reduce dust in the new regional plan.*

11.4.6 High level objectives and measures

Section 32 requires an assessment of "*...the efficiency and effectiveness of the provisions in achieving the objectives...*". Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section 1.6 'Evaluation approach' for more details.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. They signal a direction for where we want to head, without stating how far we go – that comes later (they are the beginnings of objectives).

Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against.

17 *The Hazardous Substances and New Organisms Act (HSNO) defines used oil as any oil that has been refined from crude oil, or any synthetic hydrocarbon oil, that has been used, and as a result of such use, has become unsuitable for its original purpose due to the presence of impurities or contaminants or the loss of original properties.*

High level objective	Measure
Minimise hazardous substances entering water in circumstances where they are likely to impact ecosystem or human health.	Risk of hazardous substances entering ground or surface water: 1 = very high risk. 2 = high risk. 3 = moderate risk. 4 = small risk. 5 = no risk.
Minimise costs to council (compliance and enforcement costs).	Cost to council to prove compliance: 1 = provisions are not easily enforceable, cost of monitoring falls on council. 2 = provisions are easily enforceable, costs of monitoring fall on council. 3 = provisions are clear and enforceable, council time and monitoring costs are recoverable.
Minimise costs to applicants (additional cost above HSNO and district council standards).	Cost of applying for resource consent and remediation: *these measures are informed by contaminated land consultants based on real life examples.* 1) very high ($500 000 +). 2) high 2 ($200 000-$500 000). 3) high1 ($100 000-$200 000). 4) medium 3 ($80 000-$100 000). 5) medium 2 ($50 000-$80 000). 6) medium 1 ($30 000-$50 000). 7) low 3 ($10 000-$20 000). 8) low 2 ($5000-$10 000). 9) low 1 (less than $5000). 10) no cost.
Protect adjoining property owners from the effects of hazardous substance discharges or contaminated land.	Contaminated land – risk of contamination or the effects of contamination migrating across property boundaries: 1 = high risk, limited ability to gather information on contamination and site conditions. Limited ability to intervene / require action to protect adjoining properties. 2 = some risk that contamination will migrate across property boundaries. 3 = very limited risk, certainty over the direction and speed contamination is migrating and controls can be put in place to protect adjoining properties. Discharges of hazardous substances – risk of the substance being discharged onto adjoining property, entering water abstracted for human or stock drinking or the substance being ingested by neighbour's animals: 1 = high risk of the substance being discharged across property boundaries or entering water used for drinking by humans or stock. Limited ability to require methods to protect adjoining properties.

High level objective	Measure
	2 = some risk that the substance will migrate or be discharged across property boundaries. Some controls are in place to manage the risk. 3 = very limited risk, certainty over the location where the substance will be deposited and controls can be put in place to protect water abstracted for human or stock drinking and non target species.

Minimise hazardous substances entering water

The high level objective is intended to assess the effectiveness of options against section 6(c) and sections 7(b) and (f) of the Resource Management Act 1991. It recognises that many hazardous substances have the potential to effect the health of ecosystems and people. A constructed scale has been created to show the risk of hazardous substances entering water.

Minimise costs to council (compliance and enforcement costs)

The high level object captures the cost that council incurs when monitoring compliance with rules. Variations in council's costs may occur for a number or reasons but commonly include council's ability to charge for monitoring (whether or not the activity requires resource consent), the clarity of the rules and the ease of demonstrating compliance with the rules, that is, measurability.

If rules are unclear or are not easy to measure the chance of council's decisions (resource consent or enforcement action) being challenged in court are higher. The cost of decisions being challenged in court are significantly higher than decisions being made without court intervention. Narrative measures have been used to assess this objective.

Minimise costs to applicants (additional cost above HSNO Act and district council standards)

The objective recognises that complying with regulation often comes at a cost to applicants. This measure is intended to demonstrate the cost to people seeking to use hazardous substances. It includes the cost of applying for resource consent and complying with conditions of a resource consent or permitted activity.

A scale constructed by council staff has been used to assess this objective. The values within the scale have been informed by discussions with Council staff and contaminated land consultants.

Protect adjoining property owners from the effects of contaminated land

The high level objective recognises that under the right conditions hazardous substances or contamination can migrate from one site to another. This can result in significant costs to property owners to clean up land or obtain the necessary resource consents. Other costs that may arise from cross boundary contamination could include no longer being able to abstract groundwater for drinking or irrigation or potential health costs from exposure to hazardous substances. while these costs are real they are difficult to quantify and have not been assessed.

The assessment of this objective is based on a narrative scale created by council staff.

11.4.7 Evaluating the management options

Objectives and options for the discharge of hazardous substances other than vertebrate control chemicals and agrichemicals.

High level objective for hazardous substance discharges	Option 1 status quo	Option 2 permissive approach
Minimise hazardous substances entering water in circumstances where they are likely to impact ecosystem or human health. Risk of hazardous substances entering ground or surface water:	2	3

High level objective for hazardous substance discharges	Option 1 status quo	Option 2 permissive approach
1 = very high risk. 2 = high risk. 3 = moderate risk. 4 = small risk. 5 = no risk.		
Minimise costs to council (compliance and enforcement costs). Cost to council to prove compliance: 1 = provisions are not easily enforceable, cost of monitoring falls on council. 2 = provisions are easily enforceable, costs of monitoring fall on council. 3 = provisions are clear and enforceable, council time and monitoring costs are recoverable	3	*3*
Minimise costs to applicants/land owners (additional cost above HSNO and district council standards). Cost of applying for resource consent and remediation: 1) very high ($500 000 +). 2) high 2 ($200 000-$500 000). 3) high1 ($100 000-$200 000). 4) medium 3 ($80 000-$100 000). 5) medium 2 ($50 000-$80 000). 6) medium 1 ($30 000-$50 000). 7) low 3 ($10 000-$20 000). 8) low 2 ($5000-$10 000). 9) low 1 (less than $5000). 10) no cost.	Consenting costs - 8 Remediation - 10 *Remediation should not be required under this option due to assessment of potential effects and monitoring.*	Consenting costs - 9-10 *some minor costs to meet permitted activity standards* Cost if a contaminated site is created and remediation is required1-2.
Protect adjoining property owners from the effects of hazardous substance discharges or contaminated land. 1 = high risk of the substance being discharged across property boundaries or entering water used for drinking by humans or stock. Limited ability to require methods to protect adjoining properties. 2 = some risk that the substance will migrate or be discharged across property boundaries. Some controls are in place to manage the risk. 3 = very limited risk, certainty over the location where the substance will be deposited and controls can be put in place to protect water abstracted for human or stock drinking and non target species.	3	1-2

Certainty about the evaluation

We're confident that the evaluation is accurate enough to make a decision on the preferred option. We don't think it would be viable and/or worthwhile to get more information to increase the accuracy of our evaluation as it's unlikely to change the relative differences between the options.

Time-frame of the evaluation

The evaluation is made over the life-time of the plan (10-15 years).

The preferred management option

The preferred management option is option 1.

Options 1 retains control over the discharge of hazardous substances that are not covered by rules on agrichemicals and vertebrate control chemicals. This provides the greatest level of control over the discharge and is likely to provide greater environmental protection, through site assessments and site specific conditions. The trade off is that resource consent will be required and there will be a cost imposed on dischargers to prepare and lodge an application for resource consent. This is mitigated to some extent by rules on agrichemicals and vertebrate control chemicals which account for the majority of hazardous substance discharges in Northland.

Option 2 is the most permissive and least preferred option. While the costs for discharges is low because there is no need to obtain resource consent, there is an increased risk of creating contaminated land and an increased risk of hazardous substances entering water. This option does not provide for site specific assessments to identify environmental risks at the discharge site. Rather it relies on generic conditions under HSNO (conditions are specific to the product but to the site it is being discharged into). Staff consider the risk of contaminating land to be higher where activities are undertaken as a permitted activity because there is less council oversight. On balance it was considered that the savings made by avoiding the resource consent process are outweighed by the risks to the environment. It is worth noting that environmental risk has been considered in the context of substances needing approval under the Hazardous Substances and New Organisms Act as well as any of the options being assess in this report.

Objectives and options for managing contaminated land.

High level objectives for managing contaminated land	*Option 1 – status quo*	*Option 2 – conservative approach*	*Option 3 – middle of the road*
Minimise hazardous substances entering water in circumstances where they are likely to impact ecosystem or human health. Risk of hazardous substances entering ground or surface water: 1 = very high risk. 2 = high risk. 3 = moderate risk. 4 = small risk. 5 = no risk.	2	3	4
Minimise costs to council (compliance and enforcement costs). Cost to council to prove compliance: 1 = provisions are not easily enforceable, cost of monitoring falls on council. 2 = provisions are easily enforceable, costs of monitoring fall on council.	2	3	3

High level objectives for managing contaminated land	*Option 1 – status quo*	*Option 2 – conservative approach*	*Option 3 – middle of the road*
3 = provisions are clear and enforceable, council time and monitoring costs are recoverable			
Minimise costs to applicants/land owners (additional cost above hazardous substances Act and district council standards). Cost of applying for resource consent and remediation: 1) very high ($500 000 +). 2) high ($200 000-$500 000). 3) high ($100 000-$200 000). 4) medium 3 ($80 000-$100 000). 5) medium 2 ($50 000-$80 000). 6) medium 1 ($30 000-$50 000). 7) low 3 ($10 000-$20 000). 8) low 2 ($5000-$10 000). 9) low 1 (less than $5000). 10) no cost.	Resource consent or enforcement – 3. Remediation – 1- 2.	Resource consent – 1. Remediation – 2.	Resource consent (including monitoring for 5 years) – 3.
Protect adjoining property owners from the effects of hazardous substance discharges or contaminated land. 1 = high risk, limited ability to gather information on contamination and site conditions. Limited ability to intervene / require action to protect adjoining properties. 2 = some risk that contamination will migrate across property boundaries. 3 = very limited risk, certainty over the direction and speed contamination is migrating and controls can be put in place to protect adjoining properties.	2	3	2-3

Certainty about the evaluation

There is always uncertainty about the potential impacts of management options.

The objectives and measures that we're least confident about the accuracy of are related to the costs incurred to test and remediate contaminated land because they are hugely variable depending on the contaminant and the site conditions. In this assessment it was assumed that the the site was contaminated with hydrocarbons and relatively normal site conditions were encountered. Costs are based on estimated averages from consultants working in the contaminated land field.

We're confident that evaluation is accurate enough to make a decision on the preferred option. We don't think it would be viable and/or worthwhile to get more information to increase the accuracy of our evaluation as it's unlikely to change the relative differences between the options.

Time-frame of the evaluation

The evaluation is made over the life-time of the plan (10-15 years).

The preferred management option

The preferred management option is option 3 because it strikes a balance between environmental protection and costs to applicants and land owners. This option recognises that contamination in land can have environmental impact and where contamination is likely to have adverse effects on the environment beyond the site these effects need to be managed. It also recognises that the cost of managing environmental effects and the cost of remediating contaminated land can be significant. In some cases where the risk of environmental damage is low (beyond the site boundary) contamination can remain in situ.

Option 2 is the second best option for the management of contaminated land. This option takes a strong stance toward remeditating contaminated land. This option would provide the most certainty around protecting the environment from contamination in land but could also place the significant cost of remediation on land owners. In some cases the cost of remediation does not reflect the risk to the environment. For that reason this option was discounted.

Option 1 is the least preferred option. This option focuses on managing the discharge of hazardous substances and deals with contamination through enforcement action or retrospective consents. Given that this package is focused on historical contamination a rule centred on the initial discharge of hazardous substances can be confusing. This option is not clear about how contaminated land should be managed and it requires council to test land for contamination and to prove a discharge has occurred at some time in the past.

Objectives and options for managing the discharge of vertebrate control chemicals.

High level objectives for managing contaminated land	*Option 1 Status Quo*	*Option 2*	*Option 3*
Minimise hazardous substances entering water in circumstances where they are likely to impact ecosystem or human health or reduce water quality. Risk of hazardous substances entering ground or surface water: 1 = very high risk. 2 = high risk. 3 = moderate risk. 4 = small risk. 5 = no risk.	4	4	3-4
Minimise costs to council (compliance and enforcement costs). Cost to council to prove compliance: 1 = provisions are not easily enforceable, cost of monitoring falls on council. 2 = provisions are easily enforceable, costs of monitoring fall on council. 3 = provisions are clear and enforceable, council time and monitoring costs are recoverable	3	3	2
Minimise costs to applicants (additional cost above hazardous substance Act and district council standards). Cost of applying for resource consent and remediation: 1) very high ($500 000 +). 2) high 2 ($200 000-$500 000). 3) high1 ($100 000-$200 000). 4) medium 3 ($80 000-$100 000).	8	8.5	9

High level objectives for managing contaminated land	*Option 1 Status Quo*	*Option 2*	*Option 3*
5) medium 2 ($50 000-$80 000). 6) medium 1 ($30 000-$50 000). 7) low 3 ($10 000-$20 000). 8) low 2 ($5000-$10 000). 9) low 1 (less than $5000). 10) no cost.			
Protect adjoining property owners from the effects of hazardous substance discharges or contaminated land. 1 = high risk of the substance being discharged across property boundaries or entering water used for drinking by humans or stock. Limited ability to require methods to protect adjoining properties. 2 = some risk that the substance will migrate or be discharged across property boundaries. Some controls are in place to manage the risk. 3 = very limited risk, certainty over the location where the substance will be deposited and controls can be put in place to protect water abstracted for human or stock drinking and non target species.	3	3	2

Certainty about the evaluation

We're confident that the evaluation is accurate enough to make a decision on the preferred option. We don't think it would be viable and/or worthwhile to get more information to increase the accuracy of our evaluation as it's unlikely to change the relative differences between the options.

Time-frame of the evaluation

The evaluation is made in the context of one discharge event and three months following the discharge.

The preferred management option

Option 2 is the preferred package to manage the discharge of vertebrate toxic agent(VTA) in Northland. It provides a balance between enabling the management of pest species for the protection of native flora and fauna while also recognising that there is a degree of community concern around the use of these substances. This option allows conditions to be put in place to manage environmental risk, particularly the risk of VTA's entering water.

Option 1 is the second best option. While it scores very well the cost to applicants is likely to be higher than option 2. Although options 1 and 2 both have controlled activity status's for aerial application, there is no allowance for small quantities of the VTA to enter water. Given the steep terrain and numerous small streams in the areas where aerial application will occur aerial application will nearly always be treated as a discretionary activity .

Option 3 is the least preferred option as it provides the least protection to adjoining land owners and places the highest costs on council. Even though Option 3 provides for the activity to be undertaken as a permitted activity costs will still be incurred to meet performance standards, for example Including notifying neighbours.

12 Catchment areas

12.1 Pastoral hill-country erosion in priority catchments

12.1.1 Executive summary

Section 30(1) of the Resource Management Act 1991 enables regional plan rules to control the use of land for the purposes of soil conservation and the maintenance or enhancement of the quality of fresh and coastal waters. Policy 22 of the New Zealand Coastal Policy Statement applies specific direction to reduce sediment, as does the Regional Policy Statement for Northland (Objective 3.2). At a local level the impacts of sediment on fresh and coastal waters has been identified as a significant issue in catchment plans developed for the Doubtless Bay, Waitangi, Mangere and Whangarei Harbour catchments.

This section evaluates options for managing sediment arising from hill-slope erosion in these catchments. It does not include options for the management of streambank erosion or erosion from forested land, instead the focus is on managing erosion processes on pastoral land that are estimated to deliver a high proportion of total sediment arising from hillslope erosion (gully, landslide and earthflow erosion processes).

12.1.2 Relevant provisions

The relevant Regional Plan provisions are:

E.0.1 Erosion control plans in the Doubtless Bay catchment - controlled activity

E.0.6 Erosion control plans in the Waitangi catchment - controlled activity

E.0.8 Erosion control plans in the Mangere catchment - controlled activity

E.0.10 Erosion control plans in the Whangārei Harbour catchment - controlled activity

12.1.3 The problem, opportunity and/or requirement

In Northland the use of erosion prone hill-country land for pastoral production can increase the rates of erosion (gully, landslide and earthflow) above already naturally high levels. Soil erosion on hill-country land can reduce pastoral production temporarily (landslide and earthflow erosion) or permanently (gully erosion). It can also damage farm infrastructure including fences, tracks and water reticulation. Soil erosion can also result in sediment yield. Sediment yield is often confused with soil erosion. However, soil erosion is the first part of the sedimentation process which involves erosion, sediment yield, transportation and deposition. Sediment yield from gully erosion is high as it is caused by channeled rainfall run-off and transported directly to water ways. Sediment yield from mass-movement erosion (landslides and earthflows) is typically lower but can be high where the erosion is in close proximity to a watercourse – i.e. into a gully or stream. Landslides are caused by high-magnitude storm events that occur at low frequency (decadal return periods). Earthflow erosion is caused by long wet periods and sites of erosion may remain stable for long periods of time (decades to centuries). The most effective long term method for controlling erosion and subsequent sediment yield from pastoral land is through afforestation (closely planted trees), which achieves an estimated 90% reduction – the scenario presented below is based on intermediate tree spacing (poplar/willow at 8-10 metre spacing) which is estimated to achieve a 70% reduction.

The transportation and deposition of sediment can alter water quality and bed substrates. Increases in the rate of sediment transportation and deposition can reduce habitat for sediment sensitive species and increase habitat for sediment tolerant species. It can also alter the availability of recreational, cultural, and commercial activities in waterbodies. However, quantifying the extent of the impacts of sediment on these uses & values is difficult.

The regional plan aims to improve water quality by reducing sedimentation from land disturbance activity (such as earthworks and vegetation clearance). However, it does not contain any specific provisions to address erosion / sediment yield from land in pasture. In many cases erosion from pastoral land is not a priority for landowners as effects are typically manifested downstream/off-site –measures to address sediment can also be cost-neutral or very marginal for landowners (I.e. the benefits of sediment reduction arise in downstream environments rather than significantly benefiting the landowner). Therefore incentives are often an effective form of intervention to address sediment from such areas. While such measures (E.g. council

providing free expertise / assistance to identify sources and sediment mitigation measures and provision of subsidised resources such as poplars and fencing), can be effective it relies on working with the willing and it can be difficult to target to problem areas.

Four of the five Waiora Northland Water priority catchment groups have identified sediment as a concern and have established objectives to reduce impacts of sediment on fresh and coastal waters and recommended a regulatory approach to address hillslope erosion in their respective catchment plans – these are Doubtless Bay, Waitangi, Mangere and Whangarei Harbour catchments. A similar rule is proposed across all four catchment plans and would require that an Erosion Control Plan be developed for land mapped as having high sediment yield. The catchments plans have identified high sediment yielding land to be targeted based on scenarios developed using the SEDNET model. These are outlined in the Table below:

Catchment	High sediment yielding land to be targeted	% of catchment	Area (ha)	Estimated total Hill-slope sediment (excludes surficial & streambank)	Estimated reduction in hill slope sediment (Gully, earthflow & landslip erosion) if plans fully implemented (assumes 70% reduction)	Number of Erosion Control Plans
Doubtless Bay	>500 tonnes / km2 /yr	8%	469	136,801 tonnes/yr	50%	179
Waitangi	>250 tonnes / km2 /yr	2.8%	853	15,119 tonnes/yr	27%	80
Mangere	>250 tonnes / km2 /yr	3.73%	302	6756 tonnes/yr	22%	69
Whangarei Harbour	>250 tonnes / km2 /yr	4.04%	1185	20,389 tonnes/yr	23.3%	250 (Note: approximately 156 of these are <10ha so less cost per plan)

12.1.4 Management options

This section looks at options to manage sediment yield from hill-country land. Method 4.2.2(1)(f) of the Regional Policy Statement for Northland directs the regional council to address water quality issues by: "incentivising and where necessary requiring other good management practices to prevent and control diffuse source contaminants entering water bodies". The options set out below are based on this direction. Three options have been considered to reduce sediment yield. These include no regulatory intervention and two regulatory intervention options.

We have not assessed other options to manage sediment yield such as:

- A range of high sediment yielding land scenarios for each catchment. The catchment groups have considered the options and selected the most appropriate after considering likely costs and sediment reduction. There are also a significant number of permutations which adds complexity.
- Requiring afforestation (a change of land use) of erosion prone land – while this can address sediment yield and provide a financial return to landholders, this has not been considered as there are other options available to manage effects and landowners should be able to have a choice as to how they manage land.
- Requiring remediation through wetland creation or excavation of sediment (because these actions are difficult to 'allocate' and expensive.

Option A: No regulatory intervention

This option would mean no regulatory action: I.e. no rules would be applied to target sediment yield from hill-country land in pasture and council would be limited to working with the willing (effectively the status quo). While council currently assists and supports voluntary actions by landowners to reduce erosion / sediment (through Farm Water Quality Improvement Plan and Erosion Control Plans) this is on a voluntary basis and is not driven by regional plan rules.

Option B: Require resource consent for pastoral use of high sediment yielding land

This option would require resource consent for pastoral use of mapped areas of high sediment yielding land (as a controlled activity). The resource consent process would identify areas of erosion and require the landholder to mitigate (reduce) sediment yield from sites of erosion. Sites of erosion that would be targeted would be gully erosion and landslides/earthflows connected to watercourses that can have high ongoing sediment yield. This option would mean the landowner bears the cost of applying for consent, developing an erosion control plan and the implementation costs.

Option C: Require Erosion Control Plans for pastoral use of high sediment yielding land (by 2025)

This option would require an approved 'Erosion Control Plan' for pastoral land use on areas mapped as high sediment yielding land after 1 January 2025 – if no Erosion Control Plan has been developed for the land by then, resource consent for pastoral use of the land would be required. The rule would allow landowners to choose a range of options to achieve compliance - either develop an Erosion Control Plan, afforest areas of gully, earthflow landslip erosion or obtain a resource consent. The 2025 date is to enable landowners time to achieve compliance. An Erosion Control Plan would address the same matters as resource consent required in option B above. However, development of the plan would be at council cost (in the form of assistance/advice and drafting from the council's Land Management Officers). Landholders with an Erosion Control Plan would also be able to apply for subsidised poplars, willow or fencing from the Regional Council to implement those plans. However the rule would not require the erosion control plans be implemented – this is because the costs to implement each erosion control plan are unknown and likely to vary widely - landowners would therefore have no ability to assess the financial implications of the rule. The primary intent of the rule is to compel landowners to get advice and identify measures to reduce sediment / erosion at a property scale.

12.1.5 High level objectives and measures

Section 32 of the RMA requires the council to assess the efficiency and effectiveness of proposed provisions. We have done this by assessing the costs and benefits of management options against a set of high level objectives and measures.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. Measures make the high level objectives specific and they are a metric for testing and comparing management options. The following table sets out the high level objective and associated measures used in this evaluation.

High level objective	Measure
Minimise costs to land owners. Catchment Plan objectives: • *Minimise the loss of productive soils through erosion*	Costs incurred: • consenting costs (controlled activity consent fees =$839) • Implementation costs (based on $640 per ha over 50% of the mapped area)
Minimise cost to the council	The non-regulatory costs Council incurs on behalf of the community to assist landowners to develop / implement erosion control plans • Approximately $3000 per erosion control plan
Minimise adverse effects on aquatic species and recreational water quality: Catchment Plan objectives:	The ability of the council to change behaviour at critical source areas to reduce sediment / erosion: • Minor (unlikely to be able to target / change behaviour);

High level objective	Measure
• Reduce the amount of sediment in fresh and coastal waters from high yield areas	• Moderate (likely to be marked behaviour change by 2025); • Significant (change / action will occur by 2025);

Explanation for the high level objectives and measures

Minimise costs to land owners

The first high level objective is to minimise costs to land owners of controlling sediment yield from sites of erosion.

We have used the cost of consenting and the cost of developing erosion control plans on a typical farm. We have estimated that the cost of erosion control plan implementation would be $640/ha (80 poplar poles / ha @ $8 pole). Consent fees / costs for a controlled activity are around $839 (typically non-notified).We assume that information required to support a resource consent application would be a similar cost to development of an erosion control plan (consultants with sufficient expertise, resource consent preparation and lodgement).

Minimise costs to the council

The costs included are only non-regulatory costs as regulatory costs (consent fees) can be recovered from landholders. The non-regulatory costs are the cost council incurs to assist landowners develop erosion control plans. Erosion control plan development costs are on average $3000 each. It should be noted that this is likely to be conservative as for example the Whangarei Harbour catchment has a prevalence of small lifestyle blocks less than 10ha (156 properties) where plan development costs are lower (estimated at $1000 per plan). We have however assumed 25% coverage by existing farm plans where costs are limited to updating existing content and therefore costs have been excluded.

It should be noted that actual costs to council / landowners will depend on the uptake by landowners - subsidies are available for implementation but this is difficult to predict as it depends on uptake by landowners - also the cost of subsidised poplar poles (the most effective remedy for erosion control) are projected to be cost neutral to council once nursery production is maximised. It is also assumed that post 1 January 2025 council assistance / costs will cease given the controlled activity rule will then apply.

Minimise adverse effects of sediment yield on aquatic species and recreational water quality

The transportation and deposition of sediment is known to change water quality and bed substrates. There are a wide variety of activities which contribute to increased sedimentation such as drainage of wetlands, flood works grazing of stream bank. However, sediment yield from hill-slope erosion is also a significant contributor. The amount of actual reduction in sediment yield is difficult to estimate. Instead we have used a constructed measure: the ability to target sediment reduction and the timeframe within which these will be developed.

High level objectives not included

Section 32(2)(a) of the RMA requires an assessment of the impacts on economic growth and employment opportunities. However, the impact of the management options on these matters is likely to be significant and/or cannot be determined with any confidence. Therefore, economic growth and employment opportunities have not been included as high level objectives. For more information go to the section Assessing impacts on economic growth and employment opportunities.

12.1.6 Evaluating the management options

High level objective	Measure	Option A	Option B	Option C
Minimise costs to land owners	Landholders Costs	$0 Voluntary only	Consent fee ($839 x number of total plans required: 578 = $484,942	$0 (costs of developing Erosion Control Plans would be borne by council)

High level objective	Measure	Option A	Option B	Option C
			Total erosion control plan implementation (all four catchments) $2.296 million Plan development costs $1,300,500 ($3000 average plan cost x 578 plans – less 25% existing coverage) (all costs fall to landowner – excludes fencing/lost production)	Total erosion control plan implementation (all 4 catchments - $640/ha over 50% mapped area): Whangarei Harbour: $379,000 Waitangi: $320,000 Doubtless Bay: $1.5million Mangere: $96,600
Minimise Council costs	Costs of developing Erosion Control Plans	Likely to be similar to current spend in each	$0 (all costs fall to landowner)	$1,300,500 ($3000 average plan cost x 578 plans – less 25%) excludes cost of subsidies
Reduce adverse effects of sediment from erosion prone land on aquatic species and recreational water quality	Effectiveness of intervention: Low: little ability to target sediment reduction measures and no certainty over timeframes Moderate: targeted with some certainty over timeframe High: strongly targeted and very certain timeframes.	Low: no ability to target and little certainty over timeframe (working with the willing only – no regulatory compulsion)	High: strongly targeted and high degree of certainty (resource consent required for pastoral use of mapped areas of erosion prone land within specified timeframe)	Moderate: targeted and timeframe specified (regulatory approach applies post 1 January 2025)

Certainty about the evaluation

Controlling sediment yield is widely recognised as a good practice. The methods to reduce sediment yield and the costs of sediment management in terms of dollars per hectare are also generally well understood. While this is so, this evaluation (like most others) is characterised by uncertainties, particularly in relation to:

- The costs to control sediment yield – in most cases some form of afforestation of channelised erosion will need to occur;
- The costs to council associated with subsidies - this depends on the level of commitment and resourcing provided;
- Quantitative relationships between reductions in sediment yield and improvements for aquatic species and recreational, cultural and commercial activities

Time-frame of the evaluation

Sediment yield occurs over large timescales – decades to centuries. Costs on the other hand are immediate. This evaluation looks at the costs of reducing sediment yield up to 2025. It provides an estimate of the cost of implementing erosion control plans based on the thresholds for high sediment yielding land recommended in the four catchment plans.

The preferred management option

Option C is the preferred option and is recommend by the four catchment plans. This would mean addressing sediment from pastoral land use on mapped areas of high sediment yielding land would be voluntary until 1 January 2025 at which time resource consent as a controlled activity (non-notified) would be required (if an Erosion Control Plan has not been developed for the land). A controlled activity provides certainty for landowners that consent will be granted (council cannot decline an application for a controlled activity) but allows council to apply conditions of consent to address sediment yield from erosion processes. Matters of control would be limited to managing sediment yield from active sites of gully erosion or landslide or earthflow erosion connected to the waterway network (gullies or streams). Option C is considered to provide the most appropriate level of regulatory compulsion and cost allocation (across both exacerbator / beneficiary) while providing the ability to target high sediment yielding land.

It is expected that the Council will target existing or future subsidies towards areas in the catchment mapped as high sediment yielding land. No costs are expected for landholders in developing erosion control plans under Option C however, this is based on the assumption that Council will fully fund erosion control plans in the catchments until 2025 (when the controlled activity rule would apply). This option would provide a more proactive and targeted approach to sediment reduction from high sediment yielding land than the regional plan approach. It should be noted that Option C (and associated rule) would not require that erosion control plans be implemented – this is because it is unreasonable to impose such a requirement when costs for individual landowners are not yet known.

Option A (the status quo/regional plan approach), is the least preferred given it does not effectively target areas of concern and applies no regulatory compulsion. While Option B was more effective and certain (in terms of targeting, implementation and timeframes), it was considered that requiring landowners to bear all costs (resource consent, erosion control plan development and implementation costs) was unduly onerous. It is also considered appropriate that the beneficiaries of reduced sediment yield (I.e. ratepayer / regional community) contribute to costs.

12.2 Water takes from lake Waiporohita (Doubtless Bay)

12.2.1 Executive summary

This report should be read in conjunction with the Section 32 report for Freshwater Objectives and Limits and the Taking and use of Freshwater.

This report provides an assessment of the costs and benefits of the recommended approach to managing the effects of water extraction from Lake Waiporohita in the Doubtless Bay catchment. It recommends an alternative approach to that adopted in the regional plan for managing extraction of water from lakes. While two of the high level objectives and measures used in the comparable regional section 32 report are applied to Lake Waiporohita, the relevant objectives set out in the Doubtless Bay Catchment Plan are also considered. The alternative approach recommended for Lake Waiporohita is proposed on the basis that more specific objectives have been developed by the catchment group process and there are particular issues with Lake Waiporohita that have not been considered at the regional scale.

12.2.2 Relevant provisions

The relevant Regional Plan provision is E.0.2 Water takes from Lake Waiporohita - discretionary activity

12.2.3 The problem, opportunity and/or requirement

Aquatic ecosystems in small, shallow lakes are more vulnerable to the effects of water extraction than those of larger lakes – these effects include impacts on littoral habitats due to changes in natural water levels/fluctuations, increased likelihood of algal blooms as a result of higher water temperature / nutrient concentrations and increased susceptibility to aquatic pests.

Lake Waiporohita is a small dune lake (5.6ha) classified as an outstanding freshwater body located near Tokerau Beach on the Karikari Peninsula. This shallow lake (maximum depth of 3.5m) is located in a pastoral dominated catchment. Lake Waiporohita fluctuated between eutrophic and hypertrophic states between 2005 and 2015 which means it is fertile and saturated in phosphorus and nitrogen, with very high likelihood of algae growth and blooms during calm sunny periods. Despite its impacted water quality, Lake Waiporohita is considered an outstanding freshwater body as it supports nationally endangered plants and birds with indigenous submerged plant communities.

The regional plan does not restrict the taking of water from lakes for reasonable stock drinking and domestic use (section 14(3)(b) RMA takes). It also allows for other minor takes of up to $10m^3$ per day as a permitted activity (with an allowance for an additional 200 litres per hectare up to a maximum of $20m^3$ per day per property). For the purposes of the following evaluation, these are collectively termed 'permitted takes'.

Given the above, there is a risk that even small takes (such as those permitted takes outlined above) could significantly impact on the ecological condition of Lake Waiporohita. The Doubtless Bay Catchment Group identified several objectives relating to Lake Waiporohita (both high level and specific). These include:

- Improve fresh and coastal habitats for native aquatic species.
- Adopt a precautionary approach to protect Lake Waiporohita from the potential impacts of water extraction.
- Reduce nutrient inputs into Lake Waiporohita and maintain its outstanding ecological status.

12.2.4 Management options

The regional plan does not restrict the taking of water from lakes for reasonable stock drinking and domestic use (s14(3)(b) takes). It also allows for other minor takes of up to $10m^3$ per day as a permitted activity. For the purposes of the following evaluation, these are collectively termed 'permitted takes'.

Three options are listed below for the future management of water takes from Lake Waiporohita.

Option A: retain current rules for water takes from Lake Waiporohita (the status quo)

The first option is to retain the current rules in the operative Water and Soil Plan that:

- Are silent on section 14(3)(b) takes – therefore takes from Lake Waiporohita for reasonable stock drinking and domestic use are permitted
- Specify the taking and use of water for other purposes from specified lakes is a non-complying activity (the operative Water and Soil Plan currently applies this approach to Lake Waiporohita).

Option B: provide for stock drinking, domestic use and other minor takes (up to $10m^3$) as a permitted activity (the regional plan approach)

This option involves allowing takes for reasonable stock drinking and domestic use from Lake Waiporohita as a permitted activity and allowing other minor takes of up to $10m^3$ as a permitted activity. The main changes to the status quo are:

- Explicitly allowing water takes for stock drinking and domestic use from Lake Waiporohita as a permitted activity (subject to conditions);
- Allow other minor takes of up to $10m^3$ per day as a permitted activity

Option C: require all takes to be authorised by resource consent

This option involves requiring all takes from Lake Waiporohita to obtain resource consent as a discretionary activity (including section 14(3)(b) takes for stock drinking and domestic use).

12.2.5 High level objectives an measures

Section 32 of the RMA requires an assessment of "*...the efficiency and effectiveness of the provisions in achieving the objectives...*". Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section Evaluation approach for more details.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. They signal a direction for where we want to head, without stating how far we go – that comes later (they are the beginnings of objectives). Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against.

High level objective	measure
Minimise administrative costs to water users.	Primary costs of applying for resource consent, and monitoring and metering requirements.
Minimise adverse effects on aquatic ecosystems and other water quantity related values.	The ability to control the activity so that adverse effects are avoided, remedied, or mitigated: • Minor control (likely that significant adverse effects could occur). • Moderate control (medium likelihood that significant adverse effects could occur). • Significant control (unlikely that significant adverse effects could occur). • Full control (impossible that significant adverse effects could occur).
Doubtless Bay catchment objective - Adopt a precautionary approach to protect Lake Waiporohita from the potential impacts of water extraction.	Level of precaution: Low (significant risk) = 1 Moderate (some risk) = 2

High level objective	measure
	High (very low risk) = 3

Explanation for the high level objectives and measures

Minimise administrative costs to water users

The first objective is to minimise administrative costs associated with accessing water from lakes pursuant to rules and water permits (that is, the costs of applying for water permits and/or complying with conditions of rules and permits). They also include the costs associated with transferring water permits between water users.

Costs are typically proportionate to the level of rigour needed in the preparation and consideration of an environmental impact assessment and the nature of ongoing monitoring and reporting requirements.

Minimise adverse effects on aquatic ecosystems and other water quantity dependent values

The second objective is to minimise adverse effects associated with the taking and using of water on aquatic ecosystems and other water quantity related values. The health of aquatic ecosystems, natural character, amenity and recreational values can be affected by changes to water levels. While water quantity limits (that is, minimum flows/levels and allocation limits) are set to define maximum tolerable adverse effects, a case-by-case assessment of actual and potential adverse effects are often still needed to consider site-specific values that may not be adequately protected by default interim water quality limits, particularly where theses values are known to be high as is the case with Lake Waiporohita.

We have used a constructed measure to assess whether the management options are likely to control (avoid or mitigate) significant adverse effects on aquatic ecosystems and impacts on other values. A constructed measure has been used because it is very difficult to quantify the actual and potential adverse effects of any particular management option.

Doubtless Bay Catchment Plan Objectives

We have included the relevant objective from the Doubtless Bay Catchment Plan, which seeks to adopt a precautionary approach to water takes from Lake Waiporohita to protect it from the effects of water extraction. We have used a constructed measure related to the 'level of precaution' for the Doubtless Bay objective.

12.2.6 Evaluating the management options

High level objective	Measure	Option A: retain status quo	Option B: permit RMA s14(3)(b) and minor takes ($10m^3$)	Option C: require all takes to obtain resource consent
Minimise administrative costs to water users.	Primary costs of applying for resource consent, and monitoring and metering requirements.	$0 for stock drinking / domestic use Other takes: $3144.00 (assumes limited/public notification) and $200 per annum (monitoring costs).	$0 for s14(3)(b) and minor other takes Other takes: $1678.00 (consent application) and $200 per annum (monitoring costs). $500 (if metered).	$1678.00 (consent application) and $200 per annum (monitoring costs). $500 (if metered).

High level objective	Measure	Option A: retain status quo	Option B: permit RMA s14(3)(b) and minor takes ($10m^3$)	Option C: require all takes to obtain resource consent
Minimise adverse effects on aquatic ecosystems and other water quantity related values.	The ability to control the activity so that adverse effects are avoided, remedied, or mitigated: • Minor control (likely that significant adverse effects could occur). • Moderate control (medium likelihood that significant adverse effects could occur). • Significant control (unlikely that significant adverse effects could occur). • Full control (impossible that significant adverse effects could occur).	Minor control (on takes for stock drinking / domestic use) Significant control (on other takes)	Minor control on stock drinking and other small takes Significant control on other takes (potentially significant adverse effects as a result of permitted takes)	Significant control (all takes subject to resource consent process)
Doubtless Bay Catchment Objective: Adopt a precautionary approach to protect Lake Waiporohita from the potential impacts of water extraction.	Level of precaution: Low (significant risk) = 1 Moderate (some risk) = 2 High (very low risk) = 3	2	1	3

Certainty about the evaluation

We are reasonably confident of the quantitative and qualitative information that underpins this evaluation. The size, depth, ecological values and trophic state of Lake Waiporohita are known and there is an acknowledged relationship between lake depth and the potential for effects of water extraction. We are also confident the costs of consent processes provide an accurate indication of administrative costs to access water.

Time-frame of the evaluation

The time-frame of this evaluation is the life of the plan (10-15 years).

The preferred management option

Having considered the options against competing objectives (including those of the Doubtless Bay Catchment Plan where relevant) the council considers that Option C is the most appropriate option for managing extraction of water from Lake Waiporohita. This option means there would be no permitted takes from Lake Waiporohita and all water takes (whatever the purpose) would require resource consent as a discretionary activity. We consider that the recommended option strikes an appropriate balance (that is, trade-off) between the administrative costs of accessing water and the ability to adequately control actual and potential adverse effects of water takes on the environment given:

- Lake Waiporohita is small, shallow, subject to nutrient enrichment and has outstanding ecological values – it is therefore particularly vulnerable to the effects of water extraction.
- Lake Waiporohita is not relied upon as a water source and therefore administrative costs associated with Option C are likely to be low in reality.
- The high level management objectives (of both the regional section 32 evaluation and those in the Doubtless Bay Catchment Plan) are better met by Option C than the approach in the regional plan given the particular circumstances of Lake Waiporohita .

12.3 Managere catchment stock exclusion

12.3.1 Executive summary

This report should be read in conjunction with the proposed regional plan Section 32 Evaluation for stock exclusion. It is widely recognised that excluding livestock from water can help improve water quality for recreational activities and some aquatic ecosystems. The Regional Water and Soil Plan does not currently regulate the access of livestock to the beds of lakes and rivers and has a very weak (effectively unenforceable) rule for the grazing or access of livestock to the riparian margins of rivers, lakes, and wetlands. The Regional Policy Statement for Northland 2016 states that the council will regulate the access of livestock to water bodies by, "where appropriate, requiring the restriction or exclusion of livestock to the coastal marine area, beds and margins of streams, rivers, lakes and wetlands, and encouraging livestock exclusion in other areas."

This section outlines options for livestock exclusion rules specific to the Mangere Catchment. The options are considered in the context of the physical characteristics of the Mangere catchment, the objectives developed in the Mangere Catchment Plan relating to aquatic habitats and reducing sediment and the regional approach to stock exclusion (as set out in Section 4.9 of this report).

12.3.2 Relevant provisions

The relevant Regional Plan provision is E.0.7 Access of livestock to the bed of a water body or permanently flowing watercourse in the Mangere catchment – permitted activity

12.3.3 The problem, opportunity and/or requirement

Livestock access to streams can adversely impact on the quality of water for recreational activities and some fish and invertebrate species.

Grazing of young woody vegetation in stream margins can reduce shading and root stabilisation resulting in increased water temperatures and streambank erosion. Treading damage can further destabilise banks leading to additional increases in sediment losses. Deposition of manure into streams increases concentrations of pathogens, organic matter and ammonia. Further decomposition of organic matter in streams leads to reductions in dissolved oxygen and further increases in ammonia. High temperature and ammonia levels and low dissolved oxygen levels can limit the suitability of stream habitat for some fish and invertebrate species.

Pathogens can cause human infections when swallowed and their presence in streams can reduce the suitability for recreational or cultural immersion activities. Research has revealed that livestock are the main source of E.coli contamination in water (an indicator of the presence of faecal pathogens). The access of livestock to water bodies appears to be a dominant pathway by which E.coli enters water during normal flow conditions.

Monitoring in the Mangere catchment shows that some of its streams are less suitable for immersion activities and some aquatic species than in other parts of Northland. Livestock access to streams is a concern in Mangere catchment. The Mangere Catchment Plan objectives include: improving fresh and coastal water habitats for native aquatic species, improving waterbodies for recreational and cultural activities; and improving improve the ability of waterbodies to remove contaminants. Reducing livestock access is one of the methods recommended for consideration by the plan to achieve these objectives.

The Proposed Regional Plan provides a default approach for managing livestock access to water bodies. However, the Mangere Catchment Plan recommends an alternative approach to that of the proposed regional plan. The alternative recommended in the Mangere catchment (Option B below) is assessed in the following sections.

12.3.4 Management options

Option A: Rely on the Regional Plan approach

This option would require livestock be excluded as per the table below. This reduction in livestock access to hill-country streams will be limited to pigs and dairy cows.

Livestock type	Permanently flowing rivers, streams and drains greater than 1m wide and 30cm deep*	All permanently flowing rivers, streams and drains	Natural wetlands (excluding significant wetlands)	Lakes (>1ha) and significant wetlands
Pigs and dairy cows	Excluded from the date this rule becomes operative.	Excluded from 1 January 2023 t	Excluded from 1 January 2023	Excluded from the date this rule becomes operative.
Beef cattle, dairy support cattle and deer	**Lowland areas** as mapped in Maps: Excluded from 1 January 2025. **Hill country areas** as mapped in Maps: No exclusion required.	**Lowland areas** as mapped in Maps: Excluded from 1 January 2030 **Hill country areas** as mapped in Maps: No exclusion required	**Lowland areas** as mapped in Maps: Excluded from 2025	Excluded from the date this rule becomes operative.
Dates when livestock must be effectively excluded from water bodies and permanently flowing drains.				

Option B: Rely on the Mangere Catchment Plan approach

This option recommended in the Mangere Catchment Plan is that in addition to the regional plan rules in the table above, beef cattle, dairy support cattle and deer are to be excluded from all permanently flowing rivers and drains in Hill Country areas / land with slope of >15^0 from 1 January 2025. This would mean beef cattle, dairy support cattle and deer would be required to be excluded from all permanently flowing rivers and drains in Hill Country areas 5 years earlier than in lowland areas.

Option C: A hybrid approach

This option would retain the Mangere Catchment Plan approach but apply different deadlines depending on stream type - for example require beef cattle, dairy support cattle and deer to be excluded from hill country streams and drains >1m wide and 30 cm deep by 1 January 2025 and all permanently flowing Hill Country rivers, streams and drains by 1 January 2030. This would mean the same dates for excluding beef cattle, dairy support cattle and deer would also apply in the hill country.

Option D:

Require beef cattle, dairy support cattle and deer to be excluded from all permanently flowing rivers, streams and drains in the Mangere catchment by 1 January 2025 (both Lowland and Hill Country)

Note: the regional stock exclusion rules and Options A, B and C above do not propose a prohibited activity status for livestock access to water bodies. This means landowners will have the opportunity to apply for resource consent to allow access of livestock to water bodies where it is not practicable for them to exclude them, or to provide for the short-term grazing of the banks of water bodies during certain conditions. Landowners may also use the resource consent approach if it would be more cost-effective to remedy the effects of livestock access with wetlands (than say fencing). We suggest that a restricted discretionary activity would be the appropriate status for most water body types and consent applications would be non-notified.

A permitted activity rule would apply in the transitional periods (before the stock exclusion rules take effect).

12.3.5 High level objectives an measures

Section 32 of the RMA requires the council to assess the efficiency and effectiveness of proposed provisions. We have done this by assessing the management options against a set of high level objectives and measures.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. Measures make the high level objectives specific and they are a metric for testing and comparing management options. The following table sets out the high level objective and associated measures used in this evaluation.

High level objective	Measure
Minimise adverse effects on pastoral land users	Cost ($) of excluding beef cattle from permanently flowing rivers on a typical dry stock farm
Minimise adverse effects on aquatic ecosystems and the health of livestock and people Mangere Catchment objectives: Maintain hard-bottomed river reaches and reduce sediment loads to • the Kaipara Harbour by reducing pastoral hill-slope erosion • Improve habitat for turbidity sensitive fish and invertebrate during base-flows by reducing sediment and organic matter discharges	The ability of the council to control the activity so that adverse effects are avoided, remedied, or mitigated: • No control • Minor control • Moderate control • Significant control • Full control

Explanation for the high level objectives and measures

Minimise adverse effects on pastoral land users

The first high level objective is to minimise adverse effects (costs) to pastoral land users from excluding stock from water bodies. It is based on the assumption that the full costs of exclusion will be borne by land owners. To date this has not been the case as the council has provided financial subsidies and advisory services. It is beyond the scope of this evaluation to make recommendations on whether this should continue.

We have used one measure to assess the costs of the management options: the cost of excluding livestock from permanently flowing rivers on a typical cattle farm. The following table sets out the typical costs of excluding livestock from water bodies. The information has been obtained from 380 farm plans administered by the council's land management department. It is important to note that the information contained in the table is based on a preliminary analysis and should be treated with some caution. Nevertheless, we think that they are reasonable for most dry stock farms in lowland areas.

For fencing costs we have assumed a slightly higher cost of $8p/metre given the Mangere hill-country topography. If the terrain is very difficult (for example, not accessible by machinery and rocky ground), or if electricity is not available, or certain stock types (for example, bulls) are present, then the costs for fencing both sides of the river or stream could be as high as approximately $20 per metre, with an additional cost of $2.60 per metre for the provision of water troughs.

The costs include provision for additional troughs (see Table 3) but not reticulation costs. Reticulation can be expensive and unpractical, particularly in hill country areas. However, it is difficult to determine the actual costs of reticulation requirements that may be required as a consequence of the recommended rules. This is because of a range of variables including, but not limited to, the nature and size of farms, the coverage of existing reticulation, and physical factors such as topography. For farms without reticulation the costs per hectare for a new system may be $416/hectare

Mitigation	Items required	Cost per item	Cost of item, excluding labour	Total cost of option
Fence out beef/dairy cattle	Fence stream bank with 3-wire electric fencing to exclude cattle	$2.25 per metre	$4.50 per metre (fence both sides)	$8 per metre (for rivers and streams) $4.85 per metre (lakes and coastal marine area)
	Water provision using 8 troughs per km of stream	Troughs cost $325 each. $325 x 8/1000 = $2.60m	$2.60 per metre	
Fence out all stock	Fence stream bank to exclude all stock	$16 per metre (for post and batten fencing)	$32 per metre (fence both sides)	$34.60 per metre (rivers and streams) $18.60 per metre (lakes and coastal marine area)
	Water provision using 8 troughs per km of stream	Troughs cost $325 each. 325 x 8/1000 = $2.60 per metre	$2.60 per metre	

Minimise adverse effects on aquatic ecosystems and the health of livestock and people

The second objective is to minimise adverse effects (costs) of livestock accessing water bodies on the health of aquatic ecosystems, livestock, and people. This also includes more specific objectives from the Mangere Catchment Plan. As discussed previously, it is widely recognised that livestock can cause a range of adverse environmental effects including damage and destruction of physical and biogenic habitats and water quality impairment. While there is reasonably good information on the effectiveness of excluding livestock from a water body in terms of reducing E.coli and sediment loads to water (see Table 5 below), it is challenging to model the impacts across a river network (notwithstanding lakes and wetlands) and physical habitats. It is also is very difficult to accurately quantify the benefits of excluding livestock on water quality-dependent values (for example, native fish and mahinga kai) and physical habitats. Therefore, we have used a constructed measure to assess whether the management options are likely to effectively control (avoid, mitigate or remedy) adverse effects of livestock access to water bodies. In this case only reduction (mitigation) of livestock access to waterbodies has been considered

Description	*E. coli* (% reduction annual average)	Sediment (% reduction annual average)	Source
Fence out beef/dairy cattle.	60	80	Jon Dymond and Richard Muirhead.Personal comments, 2015.
	30	40	Monaghan and Quinn, 2010.Monaghan R., and Quinn J., t2010. Appendix 9: Farms, in National Institute of Water and Atmospheric Research (NIWA), *Waikato River Independent Scoping Study*, NIWA, Hamilton.

Description	*E. coli* (% reduction annual average)	Sediment (% reduction annual average)	Source
	20-35	30-90	McKergow et al., 2007.McKergow L. A., Tanner C. C., Monaghan R. M., and Anderson G., 2007. *Stocktake of diffuse pollution attenuation tools for New Zealand pastoral farming systems*, NIWA Client Report HAM2007-16, Hamilton.

High level objectives not included

Section 32(2)(a) of the RMA requires an assessment of the impacts on economic growth and employment opportunities. However, the impact of the management options on these matters is likely to be significant and/or cannot be determined with any confidence. Therefore, economic growth and employment opportunities have not been included as high level objectives. For more information go to the section 1.7 'Assessing impacts on economic growth and employment opportunities'.

High-level objectives not included include minimising adverse effects on: weed control; maintenance of river flows; reducing flooding damage. These cannot be determined with any degree of confidence as they are likely to be site specific.

12.3.6 Evaluating the management options

High level objective	Measure	Option A	Option B	Option C	Option
Minimise adverse effects on pastoral land users	Cost of excluding all cattle from permanently flowing rivers: • Lowlands (4779 hectares) • Hill-country (1459 hectares)	*Lowlands* $184.60 / hectare or $882,203.40 for the catchment[1] (26 meters of stream per hectare @ $7.10 per meter)	*Lowlands* $184.60 / hectare or $882,203.40 for the catchment *(1)* (26 meters of stream per hectare @ $7.10 per meter).	*Lowlands* $184.60 / hectare or $882,203.40 for the catchment *(2)* (26 meters of stream per hectare @ $7.10 per meter)	$184.60 / hectare or $882,203.40 for the catchment *(3)* (26 meters of stream per hectare @ $7.10 per meter)
		Hill-country $149.60 / hectare -Dairy and pigs only (18.70 meters of stream per hectare @ $8 per meter)	*Hill-country* $149.60 / hectare or $218,266.40 for the catchment (18.70 meters of stream per hectare @ $8 per meter) Moderate impact but costs of excluding beef, dairy grazing and deer are imposed earlier than Option C.	*Hill-country* $149.60 / hectare or $218,266.40 for the catchment (18.70 meters of stream per hectare @ $8 per meter). Moderate impact - Allows staged approach.	$149.60 / hectare or $218,266.40 for the catchment (18.70 meters of stream per hectare @ $8 per meter). High impact on land owners as significantly less time for landowners to achieve compliance than other options.

3 *Costs may be smaller as the dairy industry has reported that they are already close to achieving full stock exclusion from permanently flowing rivers, streams, and drains deeper than 30cm and wider than one metre, and lakes. However costs may be incurred by the dairy industry to comply with requirements to fence smaller streams. The proportion of larger streams to smaller streams is uncertain*

2 *Costs may be smaller as the dairy industry has reported that they are already close to achieving full stock exclusion from permanently flowing rivers, streams, and drains deeper than 30cm and wider than one metre, and lakes. However costs may be incurred by the dairy industry to comply with requirements to fence smaller streams. The proportion of larger streams to smaller streams is uncertain*

1 *Costs may be smaller as the dairy industry has reported that they are already close to achieving full stock exclusion from permanently flowing rivers, streams, and drains deeper than 30cm and wider than one metre, and lakes. However costs may be incurred by the dairy industry to comply with requirements to fence smaller streams. The proportion of larger streams to smaller streams is uncertain.*

High level objective	Measure	Option A	Option B	Option C	Option
Minimise adverse effects on aquatic ecosystems and the health of livestock and people (and Mangere Catchment objectives)	The ability of the council to control the activity so that adverse effects are mitigated in a timely manner: • No control • Minor control • Moderate control • Significant control • Full control	Moderate - no exclusion required for beef, dairy grazing and deer from Hill Country rivers, streams and drains	Significant control - but in a shorter time-frame in Hill Country than Lowland areas (2025 v 2030)	Significant control - but timeframe staged depending on size of river, stream or drain. Slightly longer timeframe for Hill country rivers, streams and drains <1m wide and 30cm deep (2030).	Full control - 2025 date applied to all permanently flowing rivers, streams and drains in the catchment

Certainty about the evaluation

Excluding livestock from water bodies is widely recognised as a means to improve water quality for immersion activities and for some aquatic species. The costs of excluding livestock from water bodies in terms of dollars per metre are also generally well understood.

While this is so, this evaluation (like most others) is characterised by uncertainties, particularly in relation to:

- The costs to fence deer and pigs – however these do not appear to be extensive land use activities in the Mangere Catchment;
- The potential for lower cost fencing technolgies to occur
- The costs to council associated with monitoring and enforcing stock exclusion rules. This depends on the level of commitment and resourcing provided;
- The amount of smaller streams that dairy farmers would be required to exclude stock from; and
- Quantitative relationships between water quality improvements (for example, E.coli and Ammonia reductions)

Time-frame of the evaluation

While some benefits of excluding livestock from water bodies happen quickly (for example, improvements in microbiological water quality) others can take longer (that is, a reduction in sediment loads to estuaries due to a lag-time in a river system). Costs on the other hand are more immediate. This evaluation looks at the costs of excluding livestock across different time-frames up and across different spatial scales.

The preferred management option

In evaluating the options we have placed equal weight on the high level objectives. Option A is the least effective Option (the regional plan approach) in achieving the Mangere Catchment Plan objectives and the high level objective to minimise adverse effects on aquatic ecosystems and the health of livestock and people but is lowest cost (as it would not require beef, dairy grazing and deer in hill country to be excluded from rivers, streams and drains). Option D would be the most effective in achieving these options but would impose costs earlier than the Options B or C and is therefore less likely to meet the High Level Objective to minimise impacts on pastoral landowners. Option C is the preferred approach as it achieves the objectives of the Mangere catchment plan within a reasonable timeframe and allows a staged approach to excluding beef, dairy grazing and deer in hill country areas of the Mangere catchment and therefore better meets the high level objective to minimise adverse effects on pastoral land users. It is also better aligned with the regional rules for stock exclusion. The costs of Options B, C and D are the same but Options B and D would require landowners to face costs earlier than Option C. Option C is therefore considered to provide the best balance between achieving the environmental outcomes and minimising impacts on pastoral landowners.

12.4 Mangere catchment water quantity limits

12.4.1 Executive summary

This report should be read in conjunction with the Section 32 report for Freshwater Objectives and Limits in Section 5.2 of this report. This section provides an evaluation of the options for managing water quantity in the Mangere catchment. It should be noted that where a water body exceeds a default allocation limit (as is the case with the Mangere catchment) then the council is proposing to cap the total allocation from the water body at its current level, until such time as work is undertaken by the council or another person to justify a higher (or potentially lower) allocation limit. The relevant objectives in the Mangere Catchment Plan seek to maintain current availability / reliability of water. While the high level objectives and measures used in the regional section 32 report are applied, the relevant objectives set out in the Mangere Catchment Plan are given specific consideration.

12.4.2 Relevant provisions

The relevant Regional Plan provisions are:

Policy D.4.14 Minimum flows for rivers

Policy D.4.16 Allocation limits for rivers

12.4.3 The problem, opportunity and/or requirement

The regional plan establishes freshwater management units (FMU) for rivers for the purposes of setting water quantity objectives and limits (minimum flow and allocation limits). The FMU were determined based on broad differences in their flow regimes and the influence of changes in flow on hydraulic habitat for fish and reliability of supply on water users. Different minimum flows, allocation limits and rules for water takes are applied in each FMU - these are essentially default limits and apply unless catchment specific limits have been established or a catchment already exceeds the default limits (in which case the minimum flow and allocation are capped at the current rather than applying the default). In catchments that are above the limits a 'sinking limit' approach is proposed until the default limits are reached – i.e. if a consent holder surrenders their water allocation then this would not be available to any other person if it would result in the regional default limit being exceeded. The Mangere catchment falls within the Small Rivers FMU. The Small Rivers FMU limits are identified in the table below:

Freshwater Management unit	Minimum flow (% of mean annual low flow)	Allocation limit (% of mean annual low flow)
Small rivers	80%	40%
Mangere Catchment	72%	52%

The Regional Plan 'sinking-limit' approach is in contrast to the objectives identified in the Mangere Catchment Plan. Water extraction from summer base flows is a concern in the Mangere catchment and the minimum flows and volumes allocated already exceed the Small Rivers default. Specific objectives relating to water takes in the draft Mangere Catchment include:

- Maintain native fish habitat by maintaining current levels of water extraction from summer base-flows
- Maintain the quantity of water available for food gathering and immersion activities by maintaining current levels of water extraction from summer base-flows
- Maintain the reliability of water supplied for existing users by maintaining current levels of water extraction from summer base-flows

12.4.4 Management options

Option A: adopt the 'sinking lid' regional plan approach

This option would mean the minimum flow and allocation limits would be reduced as a result of any consents surrendered or not renewed (down to the default limits for Small Rivers).

Option B: Retain the current limits

This option would mean the current 'capped' minimum flow and allocation limits would be retained regardless of any surrendered or non-renewed consents. As a result any such allocation could be re-allocated to other applicants for water permits. However , it is important to note that these are 'limits' and an applicant for the available water would still need to demonstrate that the proposed level of water take is appropriate for that river reach (in terms of effects on aquatic ecosystem health and impacts on other water users).

12.4.5 High level objectives an measures

Section 32 requires an assessment of "...the efficiency and effectiveness of the provisions in achieving the objectives...". Our evaluation approach does this by assessing the management options against a set of high level objectives and measures.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against.

We have used the Environmental Flow Strategic Allocation Platform (the modelling tool) to assist with identifying and evaluating minimum flow and allocation limit options for Northland's river water quantity management units [4] . The modelling tool helps to characterise the outcomes of different limit options for a specific set of values associated with managing water quantity. It is important to note that the modelling tool only assesses a limited number of attributes (indicators) of aquatic ecosystem health. Table 1 below sets out the objectives and associated measures used in this report for assessing the management options – it uses the same high level objectives as the section 32 report for the regional plan, but also includes the relevant objectives identified in the Mangere Catchment Plan.

High level objective	Measure
Minimise adverse effects on the health of aquatic ecosystems.	% change in hydraulic habitat for critical fish species.
Mangere Catchment Objectives • *Maintain native fish habitat by maintaining current levels of water extraction from summer base-flows* • *Maintain the quantity of water available for food gathering and immersion activities by maintaining current levels of water extraction from summer base-flows*	Number of days when flows are around the minimum flow ("flat-lining"): ≥30 days = high degree of alteration. ≥20 days = moderate degree of alteration. ≥10 days = low degree of alteration.
Maximise the reliability water supply. Mangere Catchment Objectives	% time that water is available at the management flow (minimum flow + allocation limit).
• *Maintain the reliability of water supplied for existing users by maintaining current levels of water extraction from summer base-flows*	% time that water is available at the minimum flow.

4 *See Franklin P., Booker D., Diettrich J., 2015. Options for default minimum flow & allocation limits in Northland. Part 2: Technical report. NIWA Client Report No: HAM2013-037.*

Explanation for the high level objectives and measures

The objectives in the Mangere Catchment Plan objectives are similar to the Regional Plan objectives and therefore the same measures have been used.

Minimise adverse effects on the health of aquatic ecosystems

Water takes can impact on the health of aquatic ecosystems. Safeguarding the life-supporting capacity of aquatic ecosystems is part of the purpose and principles of the RMA and a principal objective of the National Policy Statement for Freshwater Management.

Change in the hydraulic habitat of fish species is the most widely used indicator or measure for assessing the impacts of different water quantity limits on aquatic ecosystem health. There is generally a mix of fish species in a river. Flow setting processes tend to define a "critical species", which is a species that is considered important or significant for some reason at a location and is sensitive to flow reductions. The assumption is that if the minimum flow is set to maintain the hydraulic habitat for the critical fish species at a specific level (that is, the objective) then other less critical values, such as other fish species, invertebrates and aquatic plants will be maintained by default. Healthy fish populations are also widely identified by communities as an indicator of river health and some species (for example, eels) are important taonga to many Māori [5]. The following table lists the fish species used in this report.

Critical Fish Species	Note
Banded kokopu longfin eels, shortfin eels.	The banded kokopu is representative of fish communities in coastal streams and has fairly high flow requirements. The longfin eel has high conservation value and moderately high flow requirements. Long and short fin eels also have high cultural value.

We have also used the number of days of 'flat-lining' as a measure of adverse effects on aquatic ecosystem health. Flat-lining refers to the situation where flows are artificially reduced below the minimum flow for a period of time. Generally speaking, the longer the duration of low flows, the greater the risk of negative adverse effects on aquatic ecosystems. Adverse effects can include a greater accrual of plant and algal biomass, changes in the relative abundance of fish, changes in the composition of macroinvertebrate communities, elevated water temperatures, and changes in dissolved oxygen levels[6]. A general rule-of-thumb is that if the duration of low flows (that is, flat-lining) is increased to 30 days or more per year then the degree of hydrological alteration is high, if it is increased to 20 days or more then it is moderate, and it is increased to 10 days or more then it is low[7]

Maximise the reliability water supply

When making decisions on minimum flows and allocation limits the council must consider the actual and likely impacts of the reliability of water supply on current and future water users. Reliability of supply is assessed using two measures: (1) the reliability of supply at the management flow (the "management flow" refers to when the river's natural flow equals the minimum flow plus the allocation volume (that is, limit)); and (2) the reliability of supply at the minimum flow. These two measures refer to the proportion of time that abstractions are partially restricted (in theory by the council) and the proportion of time that no abstraction is possible because the natural flows are at or below the minimum flow, respectively.

5 *Northland Tangata Whenua Freshwater Values; Prepared by Keir Volkerling for Northland Regional Council, the Ministry for Primary Industries, and the Ministry for the Environment; 2015*

6 *Options for default minimum flow & allocation limits in Northland - Part 2: Technical report; NIWA Client Report No: HAM2013-037 Franklin P., Booker D., Diettrich J; 2015*

7 *Draft Guidelines for the Selection of Methods to Determine Ecological Flows and Water Levels. Report prepared by Beca Infrastructure Ltd for Ministry for the Environment Wellington; 2008*

The optimum level of reliability of supply differs between water users. For example, drinking water supplies need to be very reliable. However, the council is not aware of any definitive guidance on what constitutes optimum reliability of supply for different uses of water. A recent report on the potential demand and opportunities for water infrastructure in Northland [8] listed the following criteria as a general guide for reliability of supply for irrigation. It is not clear if these apply to the management flow or the minimum flow:

- 100% = very good reliability.
- 94-99% = good reliability.
- 87-94% = marginal reliability.
- <87% = poor or very poor reliability.

The council also has had other expert advice that a reliability of supply of no less than 95% at the minimum flow and at least 90% at the management flow are reasonably conservative water quantity objectives.

12.4.6 Evaluating the management options

High level objective	Measure	Option A: Regional Plan approach (in the Mangere):	Option B: Mangere Catchment Plan Approach
Minimise adverse effects on the health of aquatic ecosystems. Mangere Catchment Objectives • *Maintain native fish habitat by maintaining current levels of water extraction from summer base-flows* • *Maintain the quantity of water available for food gathering and immersion activities by maintaining current levels of water extraction from summer base-flows*	% change in hydraulic habitat for critical fish species.	Improve habitat available for species to • - 13% banded kokopu • -16% longfin eel • -13% shortfin eel (as a % of natural summer base-flows without any water takes)	Maintain habitat available for species at • -15% banded kokopu • -18% longfin eel • -15% shortfin eel (as a % of natural summer base-flows without any water takes)
	Number of days when flows are around the minimum flow ("flat-lining"): ≥30 days = high degree of alteration. ≥20 days = moderate degree of alteration. ≥10 days = low degree of alteration.	21 Days	24 Days
Maximise the reliability water supply. • *Maintain the reliability of water supplied for existing users by maintaining current levels of water*	% time that water is available at the management flow (minimum flow + allocation limit).	Maintain water reliability to existing users (at management flow) at 91%.	Maintain water reliability to existing users (at management flow) at 91%.
	% time that water is available at the minimum flow.	Decrease water reliability to existing users (at minimum flow) to 95%.	Maintain water reliability to existing users (at minimum flow) at 96%.

8 *Northland Strategic Water Infrastructure Study; Prepared for Northland Regional Council by Opus, BERL, and Aqualinc; 2015.*

High level objective	Measure	Option A: Regional Plan approach (in the Mangere):	Option B: Mangere Catchment Plan Approach
extraction from summer base-flow			

Certainty about the evaluation

While the council is reasonably certain about the predicted impacts of the different management options in terms of the measures used, it is less certain about what constitutes a tolerable (or conversely unacceptable) level of impact. For example, the council can predict changes to the hydraulic habitat of fish but do not know a 'tipping' point for a loss of a fish community (if one exists). Similarly, the council can predict the impacts of the management options on the reliability of supply for water users but lack the information to determine optimum levels for different water users. However, the council's ability to predict the impact of the management options on other aspects of aquatic ecosystem health (for example, water quality) is limited in the absence of detailed investigations. However, this was acknowledged previously and was addressed by adopting a cautious approach in identifying management options. Specifically, the council only identified allocation limits that met generally accepted 'rules-of-thumb' and excluded options that would need to be underpinned by detailed and complex assessments.

Time-frame of the evaluation

This evaluation is based on the best current information on managing river flows in Northland and makes to assumptions or assessment on future use of water or changes in climate.

The preferred management option

A sinking limit would result in a minor increase in the availability of aquatic habitat and a minor decrease in the reliability of supply. Having considered the predicted minor consequences of the management options and the objectives of the Mangere Catchment Plan, the preferred option is to maintain the current minimum flows and allocation limits rather than have a sinking limit. It is considered that this approach best meets the objectives of the draft Mangere Catchment Plan to maintain the habitat available for aquatic species and the availability and reliability of water. This means an allocation limit of 52% of MALF and a minimum flow limit of 72% of MALF will apply. It should be noted that these are limits for the catchment and an applicant for consent would still need to demonstrate that a proposed water take is within the limits and appropriate for that river reach.

12.5 Whangarei harbour stock exclusion

12.5.1 Executive summary

This report should be read in conjunction with the proposed regional plan Section 32 Evaluation for stock exclusion. It is widely recognised that excluding livestock from water can help improve water quality for recreational activities and some aquatic ecosystems. The Regional Water and Soil Plan does not currently regulate the access of livestock to the beds of lakes and rivers and has a very weak (effectively unenforceable) rule for the grazing or access of livestock to the riparian margins of rivers, lakes, and wetlands. The Regional Policy Statement for Northland 2016 states that the council will regulate the access of livestock to water bodies by, "where appropriate, requiring the restriction or exclusion of livestock to the coastal marine area, beds and margins of streams, rivers, lakes and wetlands, and encouraging livestock exclusion in other areas."

This section outlines options for livestock exclusion rules specific to the Whangarei Harbour Catchment. The options are considered in the context of the catchment specific objectives developed in the Whangarei Harbour Catchment Plan relating to improving swimming water quality at sites on the Raumanga and Hatea Rivers.

12.5.2 Relevant provisions

The relevant Regional Plan provision is E.0.9 Access of livestock to the bed of a water body in the Whangārei Harbour catchment – permitted activity

12.5.3 The problem, opportunity and/or requirement

Livestock access to streams can adversely impact on the quality of water for recreational activities and some fish and invertebrate species.

Grazing of young woody vegetation in stream margins can reduce shading and root stabilisation resulting in increased water temperatures and streambank erosion. Treading damage can further destabilise banks leading to additional increases in sediment losses. Deposition of manure into streams increases concentrations of pathogens, organic matter and ammonia. Further decomposition of organic matter in streams leads to reductions in dissolved oxygen and further increases in ammonia. High temperature and ammonia levels and low dissolved oxygen levels can limit the suitability of stream habitat for some fish and invertebrate species.

Pathogens can cause human infections when swallowed and there presence in streams can reduce the suitability for recreational or cultural immersion activities. Research has revealed that livestock are the main source of E.coli contamination in water (an indicator of the presence of faecal pathogens). The access of livestock to water bodies appears to be a dominant pathway by which E.coli enters water during normal flow conditions.

The regional plan aims to improve water quality by including stock exclusion rules but does not set objectives to achieve primary contact recreation. However the Whangarei Harbour Catchment Plan has identified more aspirational objectives as follows:

- Improve water quality to primary contact recreation levels during the summer bathing season in regionally significant swimming sites within 10 years, and at additional sites within 30 years
- Improve water quality for primary contact recreation (E.coli/100mL >260 and <540 95th percentile), at the Hātea Falls and Raumanaga swimming sites during the period covered by regional council's Recreational Swimming Water Quality Programme (end of November until end of February each year) excluding heavy rainfall events.

The regional plan provisions are unlikely to achieve the objectives and therefore alternative approaches are considered.

12.5.4 Management options

This section summarises the management options to achieve the objectives of the Whangarei Harbour Catchment Plan relating to recreational water quality. In the context of this evaluation the term livestock means dairy cows, dairy support cattle, beef cattle, pigs and deer. Sheep and goats generally have minor environmental impacts. We have not assessed a purely voluntary option given:

- The proposed regional plan will require livestock exclusion for dairy/pigs and other livestock in the lowland areas
- Voluntary measures such as farm water quality plan / funding initiatives while effective when implemented, are only adopted by the willing and therefore provide no certainty an objective will be met or by when

Option A: Rely on the regional plan approach

This option would require livestock be excluded as per the table below:

Dates when livestock must be effectively excluded from water bodies and permanently flowing drains.

Livestock type	Permanently flowing rivers, streams and drains greater than 1m wide and 30cm deep*	All permanently flowing rivers, streams and drains	Natural wetlands (excluding significant wetlands)	Lakes (>1ha) and significant wetlands
Pigs and dairy cows	Excluded from the date this rule becomes operative.	Excluded from three years after the date this rule becomes operative.	Excluded from three years after the date this rule becomes operative.	Excluded from the date this rule becomes operative.
Beef cattle, dairy support cattle and deer	**Lowland areas** as mapped in Maps: Excluded from five years after the date this rule becomes operative. **Hill country areas** as mapped in Maps: No exclusion required.	**Lowland areas** as mapped in Maps: Excluded from 10 years after the date this rule becomes operative. **Hill country areas** as mapped in Maps: No exclusion required	Excluded from five years after the date this rule becomes operative.	Excluded from the date this rule becomes operative.

Option B: Apply the regional plan approach but apply earlier dates.

This option involves relying on the regional plan livestock exclusion rules (as per table above) but apply earlier dates - E.g All livestock in lowland areas to be excluded from all permanently flowing rivers two years after operative date.

Option C: Require livestock be excluded from all rivers above the Hatea and Raumanga swimming sites.

This option would require livestock to be excluded as per the regional plan (Option A) with the additional requirement that livestock also be excluded from all permanently flowing rivers in both lowland and hill country areas above the Hatea and Raumanga swimming sites within 2 years of the regional plan becoming operative.

12.5.5 High level objectives an measures

Section 32 of the RMA requires the council to assess the efficiency and effectiveness of proposed provisions. We have done this by assessing the management options against a set of high level objectives and measures.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. Measures make the high level objectives specific and they are a metric for testing and comparing management options. The following table sets out the high level objective and associated measures used in this evaluation.

Table 2: high level objectives and associated measures.

High level objective	Measure
Minimise adverse effects on pastoral land users	Cost of excluding beef cattle from permanently flowing rivers on a typical dry stock farm: $.

High level objective	Measure
Minimise adverse effects on recreational water quality at Hatea and Raumanga swimming sites.	The ability of the council to control the activity so that adverse effects are avoided, remedied, or mitigated: • Minor control (likely that significant adverse effects will occur); • Moderate control (medium likelihood that significant adverse effects will occur); • Significant control (unlikely that significant adverse effects will occur); and • Full control (impossible that significant adverse effects will occur).
Whangarei Harbour Catchment Plan objectives: • Improve water quality to primary contact recreation levels during the summer bathing season in regionally significant swimming sites within 10 years, and at additional sites within 30 years • Improve to a B state for primary contact recreation, at the Hātea Falls and Raumanaga swimming sites during the period covered by regional council's Recreational Swimming Water Quality Programme (end of November until end of February each year) excluding heavy rainfall events.	Likelihood that water quality at the Hatea and Raumanga swimming sites will meet E.coli/100mL >260 and <540 95th percentile within 10years: • Very unlikely • Unlikely • Possible • Probable

Explanation for the high level objectives and measures

Minimise adverse effects on pastoral land users

The first high level objective is to minimise adverse effects (costs) on pastoral landusers from excluding stock from water bodies and the coastal marine area. It is based on the assumption that the full costs of exclusion will be borne by land owners. To date this has not been the case as the council has provided financial subsidies and advisory services. It is beyond the scope of this evaluation to make recommendations on whether this should continue.

We have used one measure to assess the costs of the management options: the fencing cost of excluding livestock from permanently flowing rivers on a typical dry stock farm. We have omitted dairy farms on the basis that the industry has reported that they are already close to achieving full stock exclusion from permanently flowing rivers and streams, drains deeper than 30cm and wider than one metre, and lakes.

The following table sets out the typical costs of excluding livestock from water bodies.

Table 3: costs of excluding stock from water bodies.

Mitigation	Items required	Cost per item	Cost of item, excluding labour	Total cost of option
Fence out beef/dairy cattle.	Fence stream bank with 3-wire electric fencing to exclude cattle.	$2.25 per metre.	$4.50 per metre (fence both sides).	$7.10 per metre (for rivers and streams).
	Water provision using 8 troughs per km of stream.	Troughs cost $325 each. $325 x 8/1000 = $2.60m	$2.60 per metre.	

Mitigation	Items required	Cost per item	Cost of item, excluding labour	Total cost of option
Fence out all stock.	Fence stream bank to exclude all stock.	$16 per metre (for post and batten fencing).	$32 per metre (fence both sides).	$34.60 per metre (rivers and streams).
	Water provision using 8 troughs per km of stream.	Troughs cost $325 each. 325 x 8/1000 = $2.60 per metre.	$2.60 per metre.	

Relevant information on a typical dry stock farm in Northland is set out in the following table. The information has been obtained from 380 farm plans administered by the council's land management department. It is important to note that the information contained in the table is based on a preliminary analysis and should be treated with some caution. Nevertheless, we think that they are reasonable for most dry stock farms in lowland areas. This includes the provision of troughs (see Table 3) but not reticulation costs. For the evaluation below we have assumed a cost of $8p/metre given fencing costs in hill country are likely to be higher.

Reticulation can be expensive and unpractical, particularly in hill country areas. However it is difficult to determine the actual costs of reticulation requirements that may be required as a consequence of the recommended rules. This is because of a range of variables including, but not limited to, the nature and size of farms, the coverage of existing reticulation, and physical factors such as topography.

If the terrain is very difficult (for example, not accessible by machinery and rocky ground), or if electricity is not available, or certain stock types (for example, bulls) are present, then the costs for fencing both sides of the river or stream could be as high as approximately $20 per metre, with an additional cost of $2.60 per metre for the provision of water troughs.

Minimise adverse effects on aquatic ecosystems and the health of livestock and people

The second objective is to minimise adverse effects (costs) of livestock accessing water bodies on the health of aquatic ecosystems, livestock, and people. As discussed previously, it is widely recognised that livestock can cause a range of adverse environmental effects including damage and destruction of physical and biogenic habitats and water quality impairment. While there is reasonably good information on the effectiveness of excluding livestock from a water body in terms of reducing *E.coli* and sediment loads to water (see Table 5 below), it is challenging to model the impacts across a river network (notwithstanding lakes and wetlands) and physical habitats. It is also is very difficult to accurately quantify the benefits of excluding livestock on water quality-dependent values (for example, native fish and mahinga kai) and physical habitats. Therefore, we have used a constructed measure to assess whether the management options are likely to effectively control (avoid or mitigate) adverse effects of livestock access to water bodies.

Table 5: effectiveness of excluding stock from water bodies in terms of E.coli and sediment loads to rivers during base flows.

Description	*E. coli* (% reduction annual average)	Sediment (% reduction annual average)	Source
Fence out beef/dairy cattle.	60	80	Jon Dymond and Richard Muirhead.Personal comments, 2015.
	30	40	Monaghan and Quinn, 2010.Monaghan R., and Quinn J., t2010. Appendix 9: Farms, in National Institute of Water and Atmospheric Research (NIWA), *Waikato River Independent Scoping Study*, NIWA, Hamilton.

Description	*E. coli* (% reduction annual average)	Sediment (% reduction annual average)	Source
	20-35	30-90	McKergow et al., 2007.McKergow L. A., Tanner C. C., Monaghan R. M., and Anderson G., 2007. *Stocktake of diffuse pollution attenuation tools for New Zealand pastoral farming systems*, NIWA Client Report HAM2007-16, Hamilton.

High level objectives not included

Section 32(2)(a) of the RMA requires an assessment of the impacts on economic growth and employment opportunities. However, the impact of the management options on these matters is likely to be significant and/or cannot be determined with any confidence. Therefore, economic growth and employment opportunities have not been included as high level objectives. For more information go to the section Assessing impacts on economic growth and employment opportunities.

High-level objectives not included include minimising adverse effects on: weed control; maintenance of river flows; reducing flooding damage. These cannot be determined with any degree of confidence as they are likely to be site specific.

12.5.6 Evaluating the management options

High level objective	Measure	Option A	Option B	Option C
Minimise adverse effects on pastoral land users.	Cost of excluding beef cattle from permanently flowing rivers (Hatea and Raumanga catchments only)	Hatea: 41.8km unfenced lowland rivers = $334,400 Raumanga: 8.9km unfenced lowland rivers = $71,200	As per option A (same cost but over shorter timeframe (approximately 2022 as opposed to 2025/2030)	As per option A plus additional costs to exclude livestock in hill country areas: Hatea: 25.2km unfenced rivers in hill country = $201,600 (@$8/m) Raumanga: 13.4 unfenced rivers in hill country = $107,200 These costs would apply over a shorter timeframe than Option A(approximately 2022 as opposed to 2025/2030)
Minimise adverse effects on recreational water quality at Hatea and Raumanga swimming sites.	The ability of the council to control the activity so that adverse effects are avoided, remedied, or mitigated: Minor control (likely that significant adverse effects will occur);	Moderate	Moderate – significant control	Significant control

High level objective	Measure	Option A	Option B	Option C
	Moderate control (medium likelihood that significant adverse effects will occur); Significant control (unlikely that significant adverse effects will occur); and Full control (impossible that significant adverse effects will occur).			
Whangarei Harbour Catchment Plan objectives: • Improve water quality to primary contact recreation levels during the summer bathing season in regionally significant swimming sites within 10 years, and at additional sites within 30 years • Improve to a B state for primary contact recreation, at the Hātea Falls and Raumanaga swimming sites during the period covered by regional council's Recreational Swimming Water Quality Programme (end of November until end of February each year) excluding heavy rainfall events.	Likelihood that water quality at the Hatea and Raumanga swimming sites will meet a B state for primary contact within 10 years: • Very unlikely • Unlikely • Possible • Probable • Very likely	Very unlikely (given dates for applicable to livestock other than dairy – 2025 and 2030)	Possible	Probable (Assuming stock exclusion can reduce E.Coli loads by 30% - 60%)

Certainty about the evaluation

Excluding livestock from water bodies is widely recognised as a practice to improve water quality for immersion activities and some aquatic species. The costs of excluding livestock from water bodies in terms of dollars per metre are also generally well understood.

While this is so, this evaluation (like most others) is characterised by uncertainties, particularly in relation to:

- The costs to fence deer and pigs – however these do not appear to be extensive land use activities in the Mangere Catchment;
- The potential for lower cost fencing technolgies to occur
- The costs to council associated with monitoring and enforcing stock exclusion rules. This depends on the level of commitment and resourcing provided;
- The amount of smaller streams that dairy farmers would be required to exclude stock from; and
- Quantitative relationships between water quality improvements (for example, E.coli and Ammonia reductions)

Time-frame of the evaluation

While some benefits of excluding livestock from water bodies happen quickly (for example, improvements in microbiological water quality) others can take longer (that is, a reduction in sediment loads to estuaries due to a lag-time in a river system). Costs on the other hand are immediate. This evaluation looks at the costs of excluding livestock across different time-frames up to 2025, and across different spatial scales.

The preferred management option

Having considered the options, Option C is the preferred option. The option provides the most likelihood that the objectives for recreational water quality in the Whangarei Harbour Catchment Plan will be met. Costs are expected to be an addition $308,800.00 (over and above the regional plan approach) as a result of the additional requirement to exclude livestock in hill country rivers and would be incurred over a shorter timeframe (the rule would apply from two years after the operative date of the rule).

It is important to note that we are not proposing a prohibited activity status for livestock access to water bodies. This means landowners will have the opportunity to apply for resource consent to allow access of livestock to water bodies where it is not practicable for them to exclude them, or to provide for the short-term grazing of the banks of water bodies during certain conditions. We suggest that a restricted discretionary activity would be the appropriate status for most water body types and consent applications would be non-notified. The council could support this regulatory approach through the continued provision of subsidies and technical support. A permitted activity rule would apply in the transitional periods.

12.6 Afforestation and setbacks in outstanding Pouto lake catchments

12.6.1 Executive summary

This section identifies options for managing the potential effects of afforestation around the outstanding Poutō lakes in the context of the relevant objectives set out in the Pouto Catchment Plan. Plantation forestry can affect lakes in terms of both reduced water levels (I.e. less water reaching lakes) and in terms of water quality (E.g. through fertiliser use and sediment run-off during harvest). The regional functions for controlling the use of land are set out in Section 30(1) of the Resource Management Act 1991. Those relevant to the management of afforestation around Pouto lakes are:

- *the maintenance and enhancement of the quality of water in water bodies and coastal water*
- *the maintenance of the quantity of water in water bodies and coastal water*
- *the maintenance and enhancement of ecosystems.*

However council discretion to control forestry is likely to be constrained by the National Environmental Standards for Plantation Forestry, which in effect over-ride regional rules except in certain circumstances (E.g. to protect outstanding freshwater bodies). Hence, the options are only considered for application to outstanding Pouto lakes.

12.6.2 Relevant provisions

The relevant Regional Plan provisions are:

- E.0.4 New plantation forestry in the Poutō Forestry Restriction Area - restricted discretionary activity
- E.0.5 New plantation forestry within 20 metres of outstanding Poutō Lakes - restricted discretionary activity

12.6.3 The problem, opportunity and/or requirement

Dune lakes in Northland are unique and internationally significant: Northland is one of the few places in the world where dune lakes are found and is particularly unusual for the number and diversity of the lakes. Many are in pristine condition because they are so isolated and difficult to access. Dune lakes are habitats of a wide range of native plants and animals, including the rare dune lake galaxias and dwarf inanga, which are only found in some Northland dune lakes.

There are four lakes [9] on the Poutō Peninsula that have been identified in the Proposed Regional Plan as outstanding freshwater bodies in accordance with the direction of the National Policy Statement for Freshwater Management 2014 (NPSFM) (Note: the Poutō Catchment Plan has identified an additional lake as outstanding). These lakes have been deemed outstanding on the basis of their ecological values[10] . Under Objective A2(a) and Policy B4 of the NPSFM the significant values of outstanding freshwater bodies are accorded a high level of protection.

There is also direction on lake management in the Regional Policy Statement for Northland 2016 (RPS), namely to reduce the trophic level index status of the region's lakes and maintain water levels to safeguard life supporting capacity, ecosystem processes, indigenous species and associated ecosystems of freshwater [11] Associated policy and methods require setting of freshwater objectives and limits (for both water quality [12] and quantity [13]). The regional plan will deliver the regulatory elements of policy direction in both the NPSFM and the RPS. The regional plan includes lake water quantity limits for outstanding lakes (thresholds for change in lake levels and fluctuations) and rules for extraction of water:

Water quantity – minimum levels for outstanding lakes:

9 *Potentially 5 if the lake/wetland complex Sth-west of Lake Mokeno is identified as outstanding (as proposed by the Pouto Catchment Group).*
10 *Northland Lakes Strategy, NIWA June 2012*
11 *Objectives 3.2(a) and 3.3.*
12 *Policy 4.2.1 and Method 4.2.2*
13 *Policy 4.3.1 and Method 4.3.5*

1) *For deep (≥10 m) outstanding lakes, median lake levels are not changed by more than 0.5 m, and there is less than a 10% change in mean annual lake level fluctuations and patterns of lake level seasonality (relative summer vs. winter levels) remain unchanged from the natural state.*
2) *For shallow (<10 m) outstanding lakes, median lake levels are not changed by more than 10%, and there is less than a 10% change in mean annual lake level fluctuation and patterns of lake level seasonality remain unchanged from the natural state.*

These limits control activities such as the extraction water rather than land use. Water extraction can also be managed through water shortage directions but the same cannot be applied to forestry activity.

Afforestation (new plantation forestry) has potential to affect water levels in dune lakes because of high evapotranspiration rates. However, the direct relationship between the extent of forestry in a given lake catchment and impact on lake water levels is unclear – this is exacerbated by the fact that groundwater interactions with the lakes on the Poutō Peninsula are also uncertain.

Plantation forestry can also affect water quality through fertilisers, earthworks and vegetation clearance activity. Managing land disturbance activities (the disturbance of land by earthworks, land preparation or cultivation, quarrying and vegetation clearance) particularly in riparian management areas can limit impacts on lakes. The regional plan contains rules to manage the effects of these activities, however it does not apply controls on land use change (e.g. a change to more intensive farming, horticulture or plantation forestry). However it does limit the amount of water that can be extracted from lakes (and other waterbodies). There is a concern (expressed by the Poutō Catchment Group), that the establishment of large tracts of new plantation forestry in the surface water catchments of the outstanding Poutō dune lakes could adversely affect the lakes in terms of reduced lake levels and reduced water quality. In studies around New Zealand reductions in annual water yield of between 30-80% have been measured following afforestation of pasture [(14)]. A recent study [(15)] found that the main cause for the decreasing trend in Upper Rototuna Lake water levels from 2005 onwards is likely to be the increase in the area covered by mature pine trees within the Upper Rototuna Lake Catchment.

This concern has been highlighted in the recently released Proposed National Environmental Standard for plantation forestry (NESPF). The NESPF if progressed would have the effect of making afforestation a permitted activity (in most cases). In its proposed form the NESPF does however provide for regional councils to apply more restrictive controls for the purposes of protecting outstanding freshwater bodies (the NESPF applies a default of 10 metres but does not specify a maximum allowable setback). A report [(16)] by the Parliamentary Commissioner for the Environment also predicted an increase in the area of forestry in Northland of some 39,600ha by 2020 (the associated prediction maps include areas on the Poutō Peninsula).

12.6.4 Management options

This section identifies options for managing the potential effects of afforestation around the outstanding Poutō lakes. The intention is not to identify every different approach as there would be many, but to represent the range of options and highlight key differences in approaches. It is important to note that the council's RMA functions for controlling the use of land are limited to the following purpose [(17)]:

(i) soil conservation:

(ii) the maintenance and enhancement of the quality of water in water bodies and coastal water:

(iii) the maintenance of the quantity of water in water bodies and coastal water:

(iv) the maintenance and enhancement of ecosystems:

(v) the avoidance or mitigation of natural hazards:

(vi) the prevention or mitigation of any adverse effects of the storage, use, disposal, or transportation of hazardous substances.

14 *Forestry and water yield: the New Zealand example; Davie, T. and Fahey, B.; 2006*
15 *Preliminary Hydrogeological Assessment for Lake Rototuna: Mangeya, P. for Northland Regional Council; 2014 of lake level changes in Lake Rototuna*
16 *Parliamentary Commissioner for the Environment: Water quality in New Zealand - Land use and nutrient pollution, November 2013: Associated Land use maps for Northland:*
17 *RMA s30(1)(c)*

Land disturbance activities of cultivation, earthworks and vegetation clearance are addressed under other s32 reports.

Afforestation

The following sets out management options to address the potential adverse effects of afforestation on the water levels in the outstanding dune lakes on the Poutō Peninsula.

Option A: Permit afforestation in the surface water catchments of outstanding Poutō lakes except within a 10m riparian setback (regional plan approach).

This option would mean applying a setback from outstanding water bodies for afforestation and land disturbance activity (e.g. 10m as per the Regional Plan), but otherwise afforestation is a permitted activity.

Option B: Control the scale of afforestation within surface water catchments of the outstanding Poutō dune lakes and apply a 20m setback.

This option would mean resource consent would be required for the planting of new forestry trees of 5ha or more per property (land under the same ownership) as a restricted discretionary activity. Management of the effects of other land use change on lake levels would rely on rules for the take and use of water from lakes.

Option C: Prohibit afforestation in the surface water catchments of outstanding Poutō lakes.

This option would mean any new afforestation in the surface water catchments of outstanding Poutō lakes would be a prohibited activity, meaning no consent could be granted (the only option would be a plan change).

12.6.5 High level objectives an measures

Section 32 of the RMA requires the council to assess the efficiency and effectiveness (i.e. the appropriateness) of proposed provisions. We have done does this by assessing the management options against a set of high level objectives and measures.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. Measures make the high level objectives specific and they are a metric for testing and comparing management optionsTable 1 below sets out the high level objectives and associated measures used in this evaluation

Table 1 High level objectives and associated measures

High level objective	Measure
Minimise administrative costs to resource users	Expected change in (increase or decrease) in the number of resource consents required: • No change • Small change (± 1-10%) • Moderate change (± 10-33%) • Large change (± >33%)
Minimise opportunity costs for landowners	Likely change in opportunity costs: • No change (no additional restrictions on land use) • Low (minor restrictions on land use) • Moderate (potential for some land use change to be limited in scale and / or location) • Large (potential for all land use change to be restricted in scale and / or location)
Minimise the risk of adverse effects on aquatic ecosystems and other uses and values of outstanding Poutō lakes	The ability of the council to adequately control the activity (i.e. require limits on the taking of water and control land use that affect water levels in outstanding lakes) • No control • Minor level of control (likely that adverse effects could occur)

High level objective	Measure
Poutō Catchment Plan objective:*Identify and protect lakes with outstanding ecological values.* *Ensure there is low risk to habitat values and lake littoral zones in outstanding lakes (Humuhumu, Rotokawau, Mokeno and Kanono and including un-named lake/wetland complex to the south-west of Lake Mokeno.) due to water level fluctuations as a result of extraction of water and/or land use change.*	• Moderate level of control (medium likelihood that adverse effects could occur) • High level of control (unlikely that adverse effects could occur) • Full control (impossible that adverse effects could occur)

Explanation for the high level objectives and measures

Minimise costs to resource users

The first high level objective is to minimise costs to resource users. Costs fall into two categories: administrative costs and opportunity costs. Administrative costs refer to the costs associated with applying for resource consents. Opportunity costs refer to the economic costs of an opportunity not being available - in other words the extent to which rules would reduce the economic benefit arising from a change in land use.

We have used a constructed measure (the expected change in the number of resource consents required) to gauge the likely administrative cost burden of each management option. Opportunity cost is very difficult to measure given this will vary with returns on current and proposed land uses and nature of the land in question – it also depends on the extent to which the consent process 'fetters' or adds to the cost of a land use change. We have also used a constructed measure to gauge the scale of opportunity costs.

Minimise adverse effects on aquatic ecosystems and other uses and values of water

The other high level objective is to minimise adverse effects on aquatic ecosystems and other water quantity dependent values. We have also included Pouto Catchment Plan objectives:

- Identify and protect lakes with outstanding ecological values.
- Ensure there is low risk to habitat values and lake littoral zones in outstanding lakes (Humuhumu, Rotokawau, Mokeno and Kanono and including un-named lake/wetland complex to the south-west of Lake Mokeno.) due to water level fluctuations as a result of extraction of water and/or land use change.

It is very difficult to accurately quantify the effectiveness of a particular land use rule in minimising adverse effects on aquatic ecosystems because there are so many variables relating to the site and the nature of the land use proposed. Therefore we have used a constructed measure (the ability of the council to adequately control the effects of the activity on lake water levels and quality) to consistently assess the management options with respect to the high level objective.

In all other respects, we consider that the high level objectives summarised above adequately capture all of the things that matter to people when making a decision on the most appropriate management option.

12.6.6 Evaluating the management options

High level objective	Measure	Option A: Permit afforestation within Outstanding Poutō Lake catchments (except within specified riparian setback of 20m)	Option B: Afforestation in surface water catchments of outstanding Poutō lakes requires resource (restricted discretionary activity).	Option C: Prohibit afforestation in surface water catchments of outstanding Poutō Lakes
Minimise administrative costs to resource users	Expected increase or decrease in the number of resource consents required (compared with draft regional plan): • No change • Small change (± 1-10%) • Moderate change (± 10-33%) • Large change (± >33%)	No change	Small increase (9 private landowners affected but control on land use limited new forestry only)	No change (afforestation prohibited)
Minimise opportunity costs for landowners	Likely change in opportunity costs: • No change (no additional restrictions on land use) • Low (minor controls on afforestation) • Moderate (potential for some land use change to be limited in scale and / or location) • Large (potential for all land use change to be restricted in scale and / or location)	Low	Moderate: new forestry limited in scale and / or location (682ha of non-forestry land affected)	Large (afforestation prohibited)
Minimise adverse effects on aquatic ecosystems and other uses and values of outstanding lakes Poutō Catchment Plan objective:*Identify and protect lakes with outstanding ecological values.* *Ensure there is low risk to habitat values and lake littoral zones in outstanding lakes (Humuhumu, Rotokawau, Mokeno and Kanono and including un-named lake/wetland complex to the south-west of Lake Mokeno.) due*	The ability of the council to adequately control the activity (i.e. limit scale of impacts on lake levels) • No control • Minor level of control (likely that adverse effects could occur) • Moderate level of control (medium likelihood that adverse effects could occur) • High level of control (unlikely that adverse effects could occur) • Full control (impossible that adverse effects could occur)	Minor-control	High level of control	Full control

High level objective	Measure	Option A: Permit afforestation within Outstanding Poutō Lake catchments (except within specified riparian setback of 20m)	Option B: Afforestation in surface water catchments of outstanding Poutō lakes requires resource (restricted discretionary activity).	Option C: Prohibit afforestation in surface water catchments of outstanding Poutō Lakes
to water level fluctuations as a result of extraction of water and/or land use change.				

Certainty about the evaluation

Cost-benefits analyses are typically characterised by uncertainties, and this one is no different. The uncertainty in this case relates to:

- The relative influence of groundwater and surface water on lake levels in the outstanding lakes (I.e the lakes may rely more on groundwater than surface water).
- The extent to which forestry on Poutō soils influences surface water yields to lakes and water quality.
- The extent to which individual consent processes would constrain new forestry in the surface water catchments of the outstanding lakes

Nonetheless we have attempted to strike a balance between being enabling to resource users while adopting a precautionary approach to land use change in the surface water catchments of the outstanding Poutō lakes.

Timeframe of the evaluation

This evaluation is not constrained to a timeframe.

The preferred management options

Based on the above assessment the preferred management approach is Option B – apply a 20m setback for forestry activity from outstanding Poutō lakes and require afforestation of more than 5ha in the surface water catchments of outstanding Poutō lakes to obtain resource consent as a restricted discretionary activity.

This is recommended on the basis that:

1) New forestry in the surface water catchments of lakes has the potential to impact water quality of lakes particularly during harvest and if in close proximity to the lake margins. It may also reduce water yield to lakes [18] and subsequently, lake levels and lake level fluctuations.
2) Regional plan rules on setbacks for afforestation (10m) and controls on extraction of water from lakes do not manage the potential effects of new forestry on reduced water yield and lake levels or wider catchment scale land use change and potential subsequent impacts on water quality.
3) While the regional plan applies a 10m setback, 20m is considered more appropriate to protect the margins of outstanding Poutō lakes – littoral zones is sensitive to land disturbance and lakes levels fluctuate considerable over time. It is also understood that most outstanding Pouto lakes have a 20m strip of Crown land around the margins and therefore forestry companies do not operate in this area in any case.

18 *Reductions in annual water yield of between 30-80% have been measured following afforestation of pasture: Davie, T. and Fahey, B. (2006) Forestry and water yield: the New Zealand example.*

4) Forestry unlike most other land use change does not rely on the availability of significant volumes of water (E.g. irrigation for horticulture) – any such takes from outstanding lakes would be tested through the consent process and subject to conditions to ensure limits for lake levels/fluctuations were met. Water takes can also be controlled through water shortage directions whereas the effects of forestry on lake levels cannot.

5) While there are added administrative and opportunity costs as a result of controls on new forestry, these are moderate in scale and the outstanding Poutō lakes are unique and ecologically significant – as such a precautionary approach and assessment through the consent process can be justified, particularly given effects on water levels are long term.

6) While the preferred management option is more restrictive than the Proposed NES for Plantation Forestry (NES-PF) which provides a setback of 10m from outstanding freshwater bodies, this is considered justified because:

- the unique ecological/cultural values of the outstanding Pouto dune lakes warrant a high level of protection / precautionary approach,
- forestry is an established industry on the Pouto peninsula,
- dune lakes are sensitive to forestry activities (in terms of both water quality and quantity effects),
- the objectives of the Pouto Catchment Plan seek a higher level of protection than that afforded by the regional plan rules and the NES-PF
- The NES-PF provides scope for rules to be more restrictive in relation to outstanding freshwater bodies.

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[1] Reductions in annual water yield of between 30-80% have been measured following afforestation of pasture: Davie, T. and Fahey, B. (2006) Forestry and water yield: the New Zealand example. http://icm.landcareresearch.co.nz/knowledgebase/publications/public/Forestry&water%20yield-the_NZ_example.pdf

12.7 Water takes from Pouto peninsula lakes

12.7.1 Executive summary

This report should be read in conjunction with the evaluation in 5.3 'Taking and use of fresh water'. It provides consideration of alternative approaches to the management of minor water extractions from the Poutō lakes to that provided in the regional plan. Alternatives are considered on the grounds that the objectives set out in the Poutō Catchment Plan are slightly different to that of the regional plan and the characteristics of the Pouto peninsular are also unique.

12.7.2 Relevant provisions

The relevant Regional Plan provision is E.0.3 Water takes from a lake in the Poutō catchment - permitted activity

12.7.3 The problem, opportunity and/or requirement

The regional plan provides for the taking of water from lakes for reasonable stock drinking and domestic needs as a permitted activity. It also provides for small water takes for other purposes as a permitted activity. All other takes from lakes require resource consent. The issue is whether the regional plan rules for permitted takes are appropriate when applied to the lakes on the Poutō Peninsula. There are particular circumstances on the Poutō Peninsula which suggest a different approach may be appropriate, namely;

1) Sources of reliable water on the Poutō peninsula are limited given there are comparatively few rivers and they tend to have very low flows and can cease running in dry summers – they are therefore unreliable as water sources. Poutō lakes are a reliable and relatively plentiful water resource (compared with rivers and groundwater).
2) Most takes from Poutō lakes currently are small and used for stock drinking or dairy sheds ($20m^3$ – $50m^3$/day)
3) Poutō lakes are under less pressure from extraction than most other dune lakes in Northland (there are comparatively few takes)
4) The risk of significant land use change is likely to remain low [19] (and in fact the PCE report predicts the area of dairy will fall in Northland by 12,000ha by 2020 – the associated land use change prediction maps identify reduced dairy by area on the Poutō Peninsula).

The Catchment Plan for Poutō also identifies specific objectives for water quantity management as follows:

- Ensure limits on water extraction from lakes provide capacity for economic growth and reasonable access to and reliability of supply of water.
- Ensure no more than moderate risk to habitat values and lake littoral zones due to water level fluctuations as a result of extraction of water and/or land use change.

Therefore alternatives to the regional plan approach are considered below.

12.7.4 Management options

Option A: Retain the current approach in the Regional Water & Soil Plan (status quo)

The first option is to retain the current comparatively restrictive approach applied to extraction of water from dune lakes listed in Schedule E of the operative Regional Water & Soil Plan (24 Poutō lakes are listed in Schedule E). Takes from Schedule E lakes are allowed for stock drinking but all other takes require resource consent (as noncomplying activities).

Option B: apply the regional plan permitted activity rules for minor takes

19 *Parliamentary Commissioner for the Environment: Water quality in New Zealand - Land use and nutrient pollution; 2013: Associated Land use maps for Northland*

This option is to apply the regional plan approach for managing permitted activity water extraction from lakes (including outstanding lakes) as follows: Reasonable stock drinking (no volume limit); other small takes - 200 litres per hectare, per day per property up to a maximum of 20 cubic metres (provided it does occur when the lake is below a minimum level).

Other takes would be subject to the resource consent process.

Option C: Apply a higher permitted volume for takes from Poutō Lakes (other than outstanding lakes)

This option involves using the same approach as the regional plan rule but provide more permissive thresholds for takes from non-outstanding Poutō lakes; namely allows as a permitted activity takes of 200 litres per hectare, per day per property up to a maximum of 50 cubic metres provided:

- The take is not from an outstanding lake;
- The take is from a lake that is 2ha or more in area;
- The take does not exceed 50m3/day;
- Water is not taken when the water level is less than a minimum water level limit;
- The take does not adversely affect the reliability of water supply for lawfully established takes.

Other takes would be subject to the resource consent process and / or other regional rules.

Option D: Permit all takes from Poutō lakes (subject to conditions)

This option would allow all takes from the Poutō Lakes (including the outstanding lakes) as permitted activities subject to conditions as per Option B (i.e. no maximum daily volume thresholds would apply). This option would be based on the assumption that there is low risk of large takes occurring that could affect the lakes and that the conditions of a permitted activity rule would adequately manage adverse effects.

Note: section 14(3)(b) of the Resource Management Act 1991 provides the taking of water for reasonable stock drinking and domestic use. The options outlined above apply to takes for other purposes.

12.7.5 High level objectives an measures

Section 32 of the RMA requires an assessment of "*...the efficiency and effectiveness of the provisions in achieving the objectives...*". Our evaluation approach does this by assessing the management options against a set of high level objectives and measures. Refer to the section Evaluation approach for more details.

High level objectives capture the fundamental things (or values) that matter to people when determining the best management option. They signal a direction for where we want to head, without stating how far we go – that comes later (they are the beginnings of objectives). Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against.

High level objective	Measure
Minimise administrative costs to water users (for small takes from non-outstanding lakes) Poutō Catchment Plan Objective: *Ensure limits on water extraction from lakes provide capacity for economic growth and reasonable access to and reliability of supply of water.*	Costs associated with accessing and using water pursuant to rules and water permits: • Permitted activity = not applicable ($0). • Controlled (typically non-notified) = $839. • Discretionary or non-complying (typically limited or fully notified) = $3144. • Basic water meter and installation costs (for takes of <5L/s) *Water takes of ≥5L/s are required to be metered by national regulations (Resource Management (Measurement and Reporting of Water Takes) Regulations 2010).* = approx. $500. • Annual administration and monitoring charges, including for maintaining the council's hydrometric network:

High level objective	Measure
	• Permitted = not applicable ($0). • Consented minor take = around $200 per annum. • Consented moderate take = around $500. • Consented significant take = around $1000. *Note: costs do not include those associated with preparing the application or hearing costs.*
Minimise adverse effects on aquatic ecosystems and other water resource users. Poutō Catchment Plan Objective: *Ensure no more than moderate risk to habitat values and lake littoral zones due to water level fluctuations as a result of extraction of water and/or land use change.*	The ability to control the activity so that adverse effects are avoided, remedied, or mitigated: • Minor control (likely that significant adverse effects could occur). • Moderate control (medium likelihood that significant adverse effects could occur). • Significant control (unlikely that significant adverse effects could occur). • Full control (impossible that significant adverse effects could occur).

Explanation for the high level objectives and measures

Minimise administrative costs to water users

The first objective is to minimise administrative costs associated with accessing water from non-outstanding lakes pursuant to rules and water permits (that is, the costs of applying for water permits and/or complying with conditions of rules and permits). They also include the costs associated with transferring water permits between water users.

Costs are typically proportionate to the level of rigour needed in the preparation and consideration of an environmental impact assessment and the nature of ongoing monitoring and reporting requirements.

Minimise adverse effects on aquatic ecosystems and other water quantity dependent values

The second objective is to minimise adverse effects associated with the taking and using of water on aquatic ecosystems and other water users. The health of aquatic ecosystems can be affected by changes to flows and water levels. New water takes also have the potential to, if not managed properly, reduce the availability (that is, reliability) of water to existing users. While water quantity limits (that is, minimum flows/levels and allocation limits) are set to define maximum tolerable adverse effects, a case-by-case assessment of actual and potential adverse effects are often still needed to consider site-specific values that may not be adequately protected by default interim water quality limits.

This is because the recommended interim limits (minimum flows/water levels and allocation limits) provide for the protection of flow sensitive native species and reliability of supply for water users. They do not expressly provide for other values such as natural character and recreation.

Conditions are also needed in permitted activity rules to minimise adverse effects on the environment and the reliability of other users' water supplies, and address the potential for water quantity limits to be exceeded. We have used a constructed measure to assess whether the management options are likely to control (avoid or mitigate) significant adverse effects on aquatic ecosystems and impacts on other water users. A constructed measure has been used because it is very difficult to quantify the actual and potential adverse effects of any particular management option.

Poutō Catchment Plan Objectives

We have included the objectives from the Poutō Catchment Plan however separate measures have not been developed for these objectives. This is because they are considered similar to the high-level management objectives used in the regional plan section 32 evaluation for the taking and use of water and are adequately covered by the same measures (I.e. the measures for administrative costs and adverse effects can also be applied to the Poutō Catchment Plan objectives).

12.7.6 Evaluating the management options

High level objective	Measure	Option A	Option B	Option C	Option D

Minimise costs to land owners.
 	
Poutō Catchment Plan Objective:
 	
Ensure limits on water extraction from lakes provide capacity for economic growth and reasonable access to and reliability of supply of water.
	Costs associated with accessing and using water pursuant to rules and water permits:
	
	● Permitted activity = not applicable ($0).
	● Controlled (typically non-notified) = $839.
	● Discretionary or non-complying (typically limited or fully notified) = $3144.
	● Prohibited = not applicable ($0).
	● Basic water meter and installation costs (for takes of <5L/s) *Water takes of ≥5L/s are required to be metered by national regulations (Resource Management (Measurement and Reporting of Water Takes) Regulations 2010).* = approx. $500.
	● Annual administration and monitoring charges, including for maintaining the council's hydrometric network:
	  ● Permitted = not applicable ($0).
	  ● Consented minor take = around $200 per annum.
	  ● Consented moderate take = around $500.
	  ● Consented significant take = around $1000.
	
	Note: costs do not include those associated with preparing the application or hearing costs.
		$0 for stock drinking/domestic use
		
		All other takes: Non-complying (typically limited or fully notified) = $3144.
		
		Monitoring: $200-$500
		
		(Significant administrative costs: non-complying activity status for all takes other than stock drinking/domestic use)
			$0 for stock drinking/domestic use
			
			$0 other minor permitted takes up to 20m^3
			
			Consented takes: $839 - $3144
			
			Monitoring: $200-$500
			
			(Moderate administrative costs: a significant proportion of existing minor takes would require resource consent)
				$0 for stock drinking/domestic use
				
				$0 takes of 200L/ha/day/property up to 50m^3 (excluding lakes<2ha and outstanding lakes)
				
				Consented takes: $839 - $3144
				
				Monitoring: $200-$500
				
				(Minor administrative costs – the majority of existing minor takes would meet permitted activity rules)
					$0 (all takes permitted Monitoring: Takes >5L/s only $500)
					
					Very low administrative costs

Minimise adverse effects on aquatic ecosystems and other water resource users. Poutō Catchment Plan Objective: *Ensure no more than moderate risk to habitat values and lake littoral zones due to*	The ability to control the activity so that adverse effects are avoided, remedied, or mitigated: ● Little control (Likely that significant adverse effects could occur). ● Moderate control (medium likelihood that significant adverse effects could occur). ● Significant control (unlikely that significant adverse effects could occur). ● Full control (impossible that significant adverse effects could occur).	Stock drinking/domestic takes (little control) Other takes: Full control (impossible that significant adverse effects could occur).	Stock drinking/domestic takes (little control) Other takes: Significant control (unlikely that significant adverse effects could occur).	Stock drinking/domestic takes (little control) Other takes: Significant control (unlikely that significant adverse effects could occur)	All takes: Little control (likely that significant adverse effects could occur).

High level objective	Measure	Option A	Option B	Option C	Option D
water level fluctuations as a result of extraction of water and/or land use change.					

Certainty about the evaluation

We are reasonably confident with the quantitative and qualitative information that underpins this evaluation. However, our knowledge of the hydrology of the Poutō lakes is incomplete, particularly in relation to groundwater influences and natural fluctuations in lake levels. There is also not a great deal of difference between Options B and C in terms of either measure.

Time-frame of the evaluation

The time-frame of this evaluation is 10-15 years.

The preferred management option

The preferred option is Option C which would provide greater daily volumes for permitted activity water takes from Poutō lakes than that provided in the regional plan (subject to conditions). Option C can be supported on the grounds that:

- Administrative costs for landowners are lower (a greater proportion of existing takes would meet permitted thresholds);
- Conditions in the permitted activity rule can control adverse effects on the lakes and other users (including reference to minimum lake size, lake levels and effects on other users) and noting Option C does not apply to outstanding lakes given they have particularly significant ecological values;
- Option C better meets the relevant objectives given the circumstances on the Poutō Peninsula relating to availability of water (I.e. the limited options available);
- The takes permitted under Option C are relatively minor and larger / more significant takes from the Poutō lakes would still be required to obtain resource consent;
- The risk of significant land use change that may result in cumulative effects is considered low.

It is considered that the recommended option strikes an appropriate balance (that is, trade-off) between the administrative costs of accessing water and the ability to adequately control actual and potential adverse effects of water takes on the Poutō lakes and other water users.

13 Impact of the Proposed Regional Plan on council resources

Executive summary

A hypothetical assessment was made of the impact of the Proposed Regional Plan (the Plan) on council resources (if it were to be implemented). The assessment involved comparing the impact of the Plan with the current regional plans[1], and in particular:

- The change in the number of resource consents the council processes and monitors under the RMA; and
- Other impacts, for example, council efforts on providing advocacy and advice.

The assessment did not look at the impacts of the Plan on resource users.

Overall the Plan is estimated to result in a 12% decrease in the number of consents council processes and monitors.

Summary – consents processing

- If the Plan **is not** implemented, it is estimated council would receive 738 resource consents a year (on average).
- The Plan is estimated to result in 91 fewer resource consent applications a year (12% less). This equates to approximately 827 hours of staff resource consent processing time and $77,000 of resource consent application fees per year.

Summary – monitoring

- Council currently monitors 3604 activities[2].
- It is estimated the Plan would result in 437 fewer consent activities to monitor in year one of the Plan rising to 839 by year 10. This equates to 189 hours of staff time in year one and 349 hours in year 10 per year.

The most significant changes are to the following activities:

Consent type	Activity	Estimated change in the number of resource consent applications received per year	Estimated change in activities monitored per year
Coastal discharge	Stormwater	-5	-5
Coastal permit	Disturb land in coastal marine area	-10	-10
	Swing mooring in mooring zone	-17	0
	Swing mooring outside mooring zone	-10	0
	Structure	-10	-245[3]
Land discharge	Sewage (septic fields)	-40	-376[4]
Land use consent	Earthworks	-10	-10

1 *Regional Water and Soil Plan, Regional Air Quality Plan and Regional Coastal Plan.*

2 *Called "regimes" in council's data system. One activity may have one or more consents. Figure quoted is at May 2016. Also includes farm dairy effluent discharge permitted activities.*

3 *10 year average.*

4 *10 year average.*

Consent type	Activity	Estimated change in the number of resource consent applications received per year	Estimated change in activities monitored per year
	Stock exclusion	+5	+5

Other significant impacts of the Plan are:

- A saving to council of $155,000 from avoiding the need to chase up 233 illegal (unconsented) moorings (become permitted activities under the Plan).
- Potentially increased costs to council for monitoring permitted activities that would otherwise have resource consent under the current regional plans. Costs of monitoring resource consents are recovered, but not for permitted activities[5].
- Potentially increased (or diverted) costs to council for any advocacy, advice and/or financial support council chooses to provide landowners to help them comply with new stock exclusion from water ways rules.
- Likely increased costs dealing with public complaints/inquiries about heavy machinery and mangrove removal in the coastal marine area (rules more permissive and they are traditionally activities that attract public attention).

Introduction

This report assesses the impact of the Proposed Regional Plan (the Plan) on council resources.

Potentially impacted council resources are:

- Staff effort to process resource consents;
- Staff effort to monitor resource consents;
- Staff effort and other costs to follow up on existing unlawful activities;
- Staff effort and other costs for state of the environment monitoring; and
- Staff effort and funds to support any likely increase in non-regulatory action (for example, advice and subsidies).

The Plan can mainly influence council resources by:

- Changing the number and types of resource consent applications made and granted.
- Introducing new rules which may prompt council to put resources into advocacy, advice and subsidies.
- Permitting existing activities that would have otherwise been unlawful (require and do not have resource consent) and vice versa.
- Permitting activities that currently require resource consent.

This assessment does not look at:

- The impacts of the Plan on resource users, for example costs of preparing resource consent application, monitoring costs or opportunity costs.
- Impacts on council resources as a result of changes to the way council undertakes enforcement. For example, it is likely council will receive a big increase in water take resource consent applications[6]. This won't be driven by the rules (there is little difference between the current rules and the proposed rules) but by increased council enforcement effort on unauthorised water takes given the greater scrutiny on water management.
- The impacts on council resources as a result of changes to rules as a result of catchment management plans[7]. This is because at the time of writing the catchment management plans were not developed enough to estimate the potential impact.

5 *Farm dairy effluent discharges are the exception.*

6 *Staff believe there could be hundreds of existing unauthorised water takes.*

7 *Catchment management plans are being developed by catchment management groups for five priority catchments. For more information go to www.nrc.govt.nz/waiora for more information about the catchment management groups.*

Council generally attempts to recover all its costs from processing and monitoring resource consents[8]. It maintains staff levels and supporting services to process most resource consents in-house[9]. The Plan has the potential to change the number of resource consents the council processes which could affect staffing and supporting services.

Estimating potential changes to council resources in processing and monitoring resource consents as a result of the Plan involved:

- Calculating the annual number of resource consents currently processed for each activity;
- Comparing the rule between the current regional plans and the Plan; and
- Calculating the impact on staff time to process and monitor as a result of the change in the number of resource consents processed.

Estimating the impact on resource consent processing and monitoring

Calculating the number of resource consents currently processed

Data on the number of resource consents processed[10] for each year from 2006 to 2015 was extracted from IRIS (council records database). The data was broken into consent type and sub-type[11].

The 10 year average of resource consents processed by sub-type was then used as a benchmark. It was assumed that 10 years of data would capture variations in the economy[12], which is a significant driver of the number of resource consent applications council receives. In some cases, the 10 year average was adjusted for any irregular activity[13].

Comparing the rules between the current and new plans

The activity status (for example "discretionary" or "permitted") in the current regional plans and the Plan was identified for each sub-type.

Where there was no change in activity status or no major change of rule conditions, it was assumed that there would be no change to the estimated number of resource consents received a year. So for example, if the figure was 50 resource consents processed per year under the current plans, then if the rule status stayed discretionary, it was determined that there would be no change to the 50 resource consents processed a year. It was therefore assumed that the Plan would result in no change to council resources.

If there was a difference between the activity status or rule conditions in the current plans and the Plan, then a judgement[14] was made of whether there would be an increase, decrease or no change to the number or resource consent applications made.

Calculating staff time

The difference in the number of resource consents was then translated into the estimated staff time for processing and monitoring.

Resource consent processing

8 *Including the administration of the resource consents, for example the costs of maintaining records.*

9 *Some resource consent processing and monitoring is contracted out, for example if the resource consent application is highly technical.*

10 *The resource consent commencement date (generally the date when it was granted) was used to determine the year it was processed.*

11 *For example "Coastal permit" is the consent type, and "Deposit material", "Extraction" and Marine farm" are sub-types.*

12 *2006 was the end of the high GDP growth of the early 2000s. In 2007, there were significant flood events in Northland, which started the down turn, and then the global financial crisis followed in 2008. The depressed state continued until about 2011 where there was some improvement, and since 2013 there has been more significant improvement (Darryl Jones, personal comments, May 2016. Economist, Northland Regional Council).*

13 *For example, most of the marine farm resource consent records are for changes to existing marine farms allowed as a result of special law. Therefore, the average was adjusted down considerably to reflect future anticipated resource consent applications.*

14 *In consultation with council consents and monitoring staff.*

Staff time for processing resource consents was calculated by using the fee/deposit of a non-notified application as the estimate of the cost of processing the application[15] This was then multiplied by 1.45, to account for the average additional amount invoiced in addition to the fee/deposit[16]. The total resource consent charge was then divided by $93, which is the hourly charge out rate for a consents officer scale 2[17].

So for example, the fee/deposit is $729 (excluding GST)[18]. Multiplied by 1.45, this equals $1057. $1057/$93 (hourly charge out rate) = 11.4 hours of staff time.

Monitoring

Staff time for monitoring was estimated by first dismissing any activities that are monitored (or not) whether permitted or consented (for example, moorings). The next step was to determine the monitoring hours per resource consent which was inferred from the annual charge[19].

There is a difference in how activities are monitored depending on if they are a one-off (for example, earthworks) or ongoing (coastal structures).

For the one-off activities, the impact on monitoring resources was determined by multiplying monitoring hours per resource consent by the change in resource consent numbers.

For the ongoing activities, most of any of the change in resource consent numbers was as a result of existing consented activities no longer needing consent under the new plan. To estimate the impact of this, the current number of active consents monitored for the relevant activity were identified, and an estimate made of how many of these would no longer require resource consent. It was then assumed that it would take three years for all the redundant consents to be surrendered[20].

Results

Summary – consents processing

- From 2006 to 2015 (inclusive) the range in the number of resource consent applications received a year is 552 (2015) to 1402 (2010). This shows that council is used to dealing with a lot of variability in resource consent applications.
- If the Plan **is not** implemented, it is estimated council would receive 738 resource consents a year (on average).
- The Plan is estimated to result in 91 fewer resource consent applications a year (12% less). This equates to approximately 827 hours of staff resource consent processing time and $77,000 of resource consent application fees per year.

Summary – monitoring

- Council currently monitors 3604 activities[21]. Since 2010[22] the number of activities monitored has ranged from 3923 (2010) and 3571 (2012).
- It is estimated the Plan would result in 437 (12%[23]) fewer consent activities to monitor in year one of the new plan and this would rise to 839 by year 10. This equates to 189 hours of staff time per year in year one rising to 349 hours by year 10.

15 *It's assumed unlikely that there would be any change to the number of notified resource consents received, because the scale of the activities mean they would still likely be a notified resource consent application under the Plan. In other words, the change from the current regional plans to the Plan will (generally) only impact the number of non-notified applications.*

16 *This is based on data for non-notified resource consents from the 2014/2105 financial year.*

17 *Refer council Charging Policy 2015/16.*

18 *This is the fee/deposit for most non-notified applications.*

19 *From councils 2015/2016 Charging Policy – includes charges for monitoring.*

20 *Assumed that council would notify people that they would no longer need consent, and half of them would surrender in the first year, quarter in year two, and the rest in year three. Legally council cannot cancel a resource consent.*

21 *Called "regimes" in council's data system. One activity may have one or more consents. Figure quoted is at May 2016. Includes farm dairy effluent discharge permitted activities. Excludes moorings.*

22 *Data for 2013 missing.*

23 *Based on the current number of activities council monitors.*

The following table shows the estimated changes in the number of resource consents the council will receive and monitor as a result of the Plan. Activities with an estimated difference of plus or minus three or less were excluded from the table[24]. Refer Appendix 6 for more detailed analysis and results.

Table 1: change in the number of resource consent applications received and monitored as a result of the new plan.

Consent type	Activity	Resource consent applications received per year			Change in activities monitored per year	Explanation
		Current plans	New plan	Change		
Coastal discharge	Stormwater	7	2	-5	-80[25]	Most stormwater discharges likely to be permitted in the Plan. Currently 95 active consents. Estimate 80 of these will no longer need consent under the Plan.
Coastal permit	Disturb land in coastal marine area	21	11	-10	-10	Likely to be decrease in applications for minor clearance activities and use of heavy machinery because many instances permitted in the Plan.
	Swing mooring in mooring zone	19	2	-17	0	New mooring going from discretionary to generally permitted. Unlikely to be many circumstances when consent for new mooring will be required. No change in monitoring because all mooring (consented or permitted) treated the same.
	Swing mooring outside mooring zone	26	16	-10	0	Will be less applications authorising existing moorings (change from non-complying to generally permitted). But expect to see increase in applications for new moorings. Most applications to date have been for existing moorings. Expect net decrease. No change in monitoring because all mooring (consented or permitted) treated the same.
	Structure	91	81	-10	-245[26]	Less resource consent renewals as more existing structures permitted in the Plan. Some minor new structures now permitted in the Plan. However, new hard protection structure rule may need to small increase in applications. Net result – moderate decrease. Also, estimate that of the currently 860 monitored coastal structure activities, 200 will no longer need resource consent under the Plan.

24 *A change of this amount is deemed to be negligible.*
25 *10 year average.*
26 *10 year average.*

Consent type	Activity	Resource consent applications received per year			Change in activities monitored per year	Explanation
		Current plans	New plan	Change		
Land discharge	Sewage (septic fields)	50	10	-40	-376[27]	No longer need to renew consent and setback requirements not so stringent. Currently about 470 consents of which 80% (376) are estimated not to be required under the Plan.
Land use consent	Earthworks	51	41	-10	-10	Changes to permitted conditions (for example, yearly volume to exposed area). May be a decrease in applications because the permitted rules not so stringent and more flexible.
Stock exclusion		0	5	+5	+5	Stock exclusion not permitted in many areas, and will increase over time. Likely most will seek to meet the rule. Resource consent applications received will depend a lot on how the rule is enforced. Assume the council's approach will be to offer advice and to enforce significant non-compliance.

Sewage discharges to land

Of all the activities, the change in the rules for sewage discharge to land (more particularly domestic sewage discharges to land) will have the single biggest impact on council consents processing and monitoring. It accounts for:

- 40 of the 91 fewer consents council would receive a year; and
- about 50% of all consented activities that would no longer require monitoring.

Council currently receives 50 resource consent applications a year. The rules if the Plan remove the need for a consent for ongoing discharges from of a domestic septic field (will become a permitted activity). Consent is still required for installation in some circumstances and for ongoing discharges from larger septic fields, for example, a school or marae. A more minor reason for the decrease in applications is the reduction in setback requirements in the Plan. The total impact is estimated to be 40 less resource consent applications a year.

It is estimated this will impact about 80% (376) of the existing 470 consents, which means they will be able to be surrendered and rely on the new permitted activity rule. It is roughly estimated it would take about three years for all of the 376 consent holders to surrender their consents (half is the first year, quarter in year two, and the remainder in year three). This is based on assumption that council would notify these consent holders to let them know that consent is not required.

A word of caution

As with any analysis, it is only as good as the data and assumptions.

Council keeps good data on consents and monitoring. However, it records the data about consents differently for consent processing and consents monitoring. The result is that the staff resourcing impact figures reports may be overstated.

27 *10 year average.*

Consents processing data is recorded based on the number of consents applied for and issued. However, an application for a single activity may be made up of a number of resource consents. For example, an earthworks activity may be made up of a consent for the earthworks itself, diversion of stormwater and discharge of stormwater (three consents). This means that while such an application may get processed for the standard fee/deposit of $729, in the data it gets recorded as three separate consents. Effort has been made to remove this double counting (where identified in consultation with consents staff), but there is a risk that the analysis and results has double counted some staff effort, which means the figures quoted for the change to staff effort to process resource consents may be overstated.

The monitoring data is recorded by "regime", which is the overall activity. So, using the earthworks activity example with its three consents, in the monitoring records it is only recorded as one monitoring regime – which reflects that fact that a monitoring officer will generally monitor all the consents at the same time. While this was accounted for where identified, there is again a risk of overestimating staff effort. Using the earthworks example, the effort takes to monitor the earthwork does not vary a lot whether there is one consent to monitor or three. Again, the risk therefore is the staff effort for monitoring may be overstated.

It is also important to note the inherent inaccuracy of the change (or not) of number of resource consent applications as they are based on staff judgement. While precise figures have been used for ease of analysis, they should not be interpreted as definitive. However, we are confident that the figures do capture whether there will be a marked increase or decrease, and magnitude of the change.

Other impacts

This section is a discussion of the other significant impacts of the Plan of council resources, not related to the processing and monitoring of resource consents.

Moorings

The council will save itself the resources of chasing up the removal of existing unconsented moorings.

The new rules make existing moorings outside mooring zones generally permitted. There are an estimated 233 currently unauthorised moorings outside mooring zones, most of which will become authorised under the Plan. Council had been (up until about five years ago) actively chasing up mooring owners to apply for consent.

Under the current rules most of the existing unconsented moorings are non-complying activities and are not consistent with policy. This means they are unlikely to get resource consent. Therefore, they will need to be removed.

It is estimated that it would take on average two hours of staff time per mooring to chase up the removal of moorings. At $85 per hour, this equates to about $40,000. It is anticipated many people would not voluntarily remove their mooring – which means council would have to pay for the removal. It is estimated that a single mooring will cost $2150 to be removed[28]. Assuming 100 moorings require removal by council, this equates to $215,000. Some of these costs may be recovered – estimate $100,000. The net cost to council to have 233 moorings removed is estimated to be $155,000.

Coastal structures

The estimated decrease in resource consent applications for coastal structures is mainly driven by new rules which make many existing structures permitted. This means that many structure owners will not need to apply to renew their resource consents.

There are currently about 1250 consented structures. Of these, council collects an annual monitoring/administration charge and navigation safety bylaw charge on about 860[29] structures.

It is calculated that the new permitted structures rule in the Plan would mean about 200 of the 860 charged structures would no longer be charged (because they would become permitted). This equates to $24,000 per year less revenue for monitoring/administration[30] (about 250 staff hours per year). The obvious response is that council would no longer monitor these structures.

28 *Made up of a site visits by council vessel ($300), cost of contractor to remove mooring ($1000) and 10 hours of staff time at $85/hour.*

29 *Where there are two or more consents for an activity (for example, the port) the monitoring and administration charge is generally only loaded on the most significant activity. Also this figure does not include marine farms.*

30 *Which equates to a saving of about $120 per structure per year for the owner.*

However council monitoring staff have suggested that there would be benefits in continuing to monitor the permitted structures in order to keep a record of the structures for future reference and to better keep track of any new unlawful structures. For this to happen, council would need to offset most of the lost revenue.

Another likely loss of revenue is the Navigation safety bylaw fee that every (consented) structure and mooring is charged. The navigation safety bylaw charge annual revenue from the 200 structures is about $6000. Council has the ability to continue to charge permitted activities the Navigation safety bylaw fee. However the Harbourmaster's view is that council should not charge these permitted structures the Navigation safety fee because the costs of collection[31] and the costs of dealing with aggrieved permitted structure owners is likely to negate the loss of revenue.

Stock exclusion

The new Regional Plan will have new rules requiring stock exclusion in prescribed circumstances.

It is expected that council will invest resources in advocacy, advice and financial support to support land owners complying with the new stock exclusion rules. Council has yet to discuss what effort it will invest in this work. However, it could potentially be significant.

Disturbance in coastal marine area

It is anticipated council will spend more time dealing with public complaints/enquiries about heavy machinery in the coastal marine area.

The new rules relax the controls around heavy machinery in the coastal marine area for removing material and maintaining coastal structures. Heavy machinery in the coastal marine area has traditionally attracted public attention. The new rules will likely mean heavy machinery in the coastal marine will be more frequently used.

Conclusion

The Plan will result in about a 12% decrease in the number of consents council will process and monitor. Other significant impacts estimated are:

- A saving to council of $155,000 from not needing to chase up 233 illegal moorings.
- Potentially increased costs to council for monitoring permitted activities that would have otherwise required resource consent under the current regional plans.
- Potentially increased (or diverted) resources for any advocacy, advice and financial support council chooses to provide land owners to comply with the new stock exclusion rules.
- Likely increased costs dealing with public complaints/enquiries about heavy machinery in the coastal marine area (rules more permissive and traditionally been an activity that attracts public attention).

As with any analysis, it is only as good as the data and assumptions, and therefore the results should be interpreted with caution.

31 *We do not know what the specific cost of collection would be as this has never been calculated and wouldn't be an easy task.*

14 Appendicies

14.1 Appendix 1 - Section 32 Template

Executive summary

Briefly describe the scope of the topic – what it includes, and what it doesn't include. Provide a summary of the key problem(s), the preferred management option, the key trade-offs, and the key reasons why the preferred management option was chosen.

Relevant provision

Identify the provisions of the regional plan the evaluation supports.

Legal background

Brief discussion of the key aspects of the RMA and other relevant law

Planning documents

Briefly describe key aspects of the planning context for the topic – any relevant national policy statements, regional Policy Statement, iwi planning documents, any important a management plans etc.

The problem, opportunity and / or requirement

Provide a brief overview and scope of the resource area / matter.

Provide an overview of the problem, opportunity and/or requirement with the state and/or management of the resource area / matter

In setting out the problem, think about:

- *its symptoms,*
- *the cause of it,*
- *the evidence for it,*
- *how certain we are about the problem,*
- *any key information gap(s) that if filled would increase certainty about the problem and resource/cost/time estimate to fill the information gaps,*
- *the likely reduction or escalation of the problem over time;*

Describe:

- *how the regional council is currently addressing the problem;*
- *what would happen if the council didn't do anything; and*
- *the key drivers for why the regional should do something about it.*

Refer to the regional plans review.

Acknowledge what's working with respect to managing the resource / matter and / or requirement, and why.

Management options

A long list should be created to begin with of all possible options, and there are a number of sources for formulating this list to ensure it includes all reasonably practicable options, including:

- *existing packages of policies and rules (the status quo)*
- *options identified:*
  - *through public consultation and engagement with iwi/Māori*

- *in other strategic documents such as iwi management plans*
- *through previous or new research studies or international approaches*
- *through plan effectiveness monitoring*
- *by politicians*
- *the provisions or methods used by other local authorities to manage the same issue*
- *options that represent varying levels of regulatory control*
- *regulatory and non-regulatory approaches.*

Has to be at least two options, and expectation is that the greater the scale/significance the more selected options.

Screening the management options

The options are screened to make sure they are relevant:

- *Relates to the problems, opportunity and / or requirement*
- *Is within scope of councils functions*
- *Is consistent with higher level documents (e.g. RMA Part II, NZCPS and RPS)*

You only need to discuss the management options that are not considered to be relevant and are not assessed any further.

High level objectives

Section 32 requires an assessment of "...the efficiency and effectiveness of the provisions in achieving the objectives...".

This analysis does this by analysing the management options against a set of high level objectives and measures.

'High level objectives':

- *capture the fundamental things (or values) that matter to people (the key costs and benefits) when determining the best management option,*
- *signal a direction for where we want to head, without stating how far we go – that comes later,*
- *are what the management options are assessed against to determine their efficiency and effectiveness (s32(1)(b)(ii)).*
- *are not 'objectives' as referred to in the RMA.*

Measures make the high level objectives specific. They are a metric for the high level objective and are used to test the management options against. The measure relates specifically to the subject of the high level objective. So for example, if the high level objective was to minimise compliance cost to resource users, the measure could be the cost of applying for resource consent.

Section 32 requires an assessment of the impacts on economic growth and employment opportunities (s32(2)(a)). These are included as high level objectives or there's an explanation why they haven't been included.

It's important to be clear about the information source for the measure as it indicates the level of certainty we have about the measure and the assessment. The first option for a measure to be quantifiable [1]. The reality is it can be very difficult and / or expensive to quantify impacts.

Section 32 requires that the report "...contain a level of detail that corresponds to the scale and significance of the environmental, economic, social, and cultural effects that are anticipated from the implementation of the proposal...". This is reflected in:

- *The range of high level objectives,*
- *The accuracy and specificity of the measures, and/or*
- *The reliability of the information source.*

1 *Section 32(2)(b)*

Discuss why the high level objectives and measures were chosen.

Briefly discuss any potential high level objectives and measures that weren't included and why.

Also discuss the information used to determine the 'score' for the measure. These might include technical reports, feedback from workshops or expert judgement.

Evaluating the management options

Time and time lags

Think carefully about time and time lags. You need to be clear about 'when' you are making your evaluation. Choose a point in time in which you would expect to the majority of changes anticipated occurring and stick with this for all the criteria evaluations.

It may take a while for actions to take effect and to start generating benefits (effect lags). For example, if you're considering a restriction of fertiliser application, it is likely to be some years before there is corresponding improvement in water quality. It may also include a threat which has yet to occur, for example a tsunami. Lastly, there may be a lag while people change their behaviour – even if your option includes rules.

Certainty

There is always uncertainty about the potential impacts of management options. We are trying to predict what would happen in the future if we were to implement each management option. We don't often know what and where demand for resources will be, getting better information can be too expensive, and many of values we have can't be scientifically quantified. Therefore we have no choice but to make 'best guesses'. It's important that we recognise and understand the level of certainty we have about potential impacts when making decisions about options, particularly when it comes to significant impacts.

The preferred option

The preferred option may be immediately obvious, but often it won't. In this case, it will generally come down to a trade-off of usually two competing values (e.g. risk to the environment vs cost to developers). The weight given to any particular value is a judgement call. This could be based on factors like certainty of information, the risk of adverse impacts, and national direction.

14.2 Appendix 2 - History of Plan Change 4 (Aquaculture) to the Regional Coastal Plan

Prior to January 2005: Dual permitting system

Prior to January 2005 a dual permitting system for aquaculture required applicants to first gain a resource consent under the Resource Management Act (RMA) 1991, and then a permit from the Ministry of Fisheries under the Fisheries Act 1983.

A fivefold increase in demand nationwide for marine farms in the late 1990s highlighted a need for a more controlled planning regime and the need for better integration between coastal planning, aquaculture and fisheries management, and the agencies involved.

"Regional and unitary councils were left dealing with applications for marine farms on a first-come, first-served basis, with little guidance on how marine farming fitted into overall coastal management. The results were bottlenecks and high processing costs for applicants, submitter fatigue, costly delays in developing regional coastal plans, local moratoria and poor environmental outcomes as there was little strategic direction on the location of marine farms to deal with their cumulative effects. Marine farmers, local communities, fishers and the Government wanted change."
(Source: Ministry for the Environment)

August 2000: Government begins consultation on improvements

In August 2000 the government began consulting about how to improve the aquaculture management regime in New Zealand. In November 2001 a two year national moratorium on new marine farm applications was put in place pending the reforms.

In March 2002 the moratorium was extended to 31 December 2004 to ensure the aquaculture reform would be consistent with the foreshore and seabed policy.

In anticipation of the government's reforms between December 2002 and March 2003, Northland Regional Council consulted the public about developing constraints maps.s

December 2003: Council asks for public feedback on possible Aquaculture Management Areas

In response to public feedback on the constraints maps, the Council did more map work and in December 2003 asked for public feedback on possible Aquaculture Management Areas.

Read the press releases:
- Second round aquaculture consultation
- Aquaculture feedback tour

April 2004: 19 possible Aquaculture Management Areas identified

Having identified 19 potential AMA's the Council's Aquaculture Project went on hold in anticipation of new legislation from central government.

January 2005: New aquaculture legislation introduced

In January 2005, the Government introduced new Aquaculture Legislation and the Council reassessed their proposed approach to aquaculture management. During this period the list of potential Northland AMAs dropped to 18.

January 2006: Council adopts Invited Private Plan Change Approach

In January - February 2006 the Council announced their decision to adopt an Invited Private Plan Change (IPPC) approach to establishing AMAs (no longer advocating any particular AMAs) and asked the public for feedback on Draft Plan Change 4, the framework that would be used to evaluate requests for IPPCs.

June 2006: More detailed work carried out by the Council on Draft Plan Change 4

In response to public feedback Council decided to do more collaborative work on the detail of Draft Plan Change 4. Between June and August 2006 they hosted three technical workshops with key stakeholders including industry, environmental and community groups.

These workshops worked out detailed issues and objectives, policies, methods, rules and information requirements to include in Proposed Plan Change 4.

The Council has also developed a Proposed Threshold Test for deciding whether to publicly notify requests for private plan changes (to establish AMAs) and maps to help inform Council's decision making.

February 2007: Submissions close for Proposed Plan Change 4 and supplementary documents

The public were able to make submissions on Proposed Plan Change 4 between 28 October 2006 and 14 February 2007. During this period the Council held four 'open-day' information events around the Region. In the end, 333 submissions were received.

June to August 2007: Further submissions received

A summary of the 333 submissions was notified in June. Further submissions were made in support of, or in opposition to the original submissions. Futher submissions closed in August 2007.

November - December 2007: Hearings

Hearings were held for Proposed Plan Change 4 and associated Local Government Act documents.

2008 - 20015: Environment Court

Twelve appeals were made to the Environment Court on the Council decisions on Plan Change 4. Negotiations started but were then put on hold when the 2011 amendments to the RMA were signalled. Once the new legislation was enacted, negotiations resumed culminating in a Environment Court hearing in 2013. The final Environment Court decisions were made in June 2015.

14.3 Appendix 3 - Calculations of impact of management options on hypothetical aquaculture development

These are the workings to show how the management options were assessed against the hypothetical aquaculture development areas.

First step - the hypothetical areas were assessed to determine whether they are in an outstanding area, important area or general coastal area (refer 8.6.4 'Management options' for description of areas) because some of the options have a different activity status for new aquaculture in these areas.

Location	Area and type	Area
Te Puna Inlet, Bay of Islands	25 ha (oyster)	General coastal
Hokianga Harbour	50 ha (oysters)	General coastal
Whangape Harbour	20 ha (oysters)	General coastal
Herekino Harbour	20 ha (oysters)	General coastal
Mid Hokianga Harbour	20 ha (finfish)	General coastal
Henry Island (Whangaruru Harbour entrance)	10 ha (finfish)	Important area
Te Ngaire	40 ha (finfish)	General coastal
Flat Island (between Cavalli and Stephenson's islands)	70ha (mussels)	General coastal
Bream Bay	200ha (mussels)	Important area
Whangamumu Pt - Home Pt	350ha (mussels)	Outstanding area
Takou Bay	300ha (mussels)	General coastal
Rangihoua Bay (Bay of Islands)	35ha (mussels)	Important area
Tauroa Pt (Ahipara)	100ha (mussel spat)	General coastal

Summary of total hectares for each aquaculture type.

Species	Outstanding areas	Important areas	General coastal areas	Total hectares of hypothetical area
Oyster	0 ha	0 ha	115 ha	115 ha
Mussel and mussel spat	350 ha	235 ha	470 ha	1055 ha
Fin fish	0 ha	10 ha	60 ha	70 ha

Second step - assess the potential hectares for each option by aquaculture type and activity status. This includes applying the multiplier (0.5 for discretionary and 0.25 for non-complying).

Oyster

Option	Raw	With multiplier	Prohibited
A	115 ha (discretionary)	57.5 ha	0
B	115 ha (discretionary	57.5 ha	0
C	115 ha (discretionary	57.5 ha	0
E	115 ha (discretionary	57.5 ha	0

Mussel and mussel spat

Option	Raw	With multiplier	Prohibited
A	470 ha (discretionary)	235 ha	585 ha
B	470 ha (discretionary)	235 ha	585 ha
C	705 ha (discretionary) 350 ha (non-complying)	352.50 ha (discretionary) 87.5 ha (non-complying) Total: 440 ha	0
E	1055 ha (discretionary)	527.5	0

Fin fish

Option	Raw	With multiplier	Prohibited
A	60 ha	30 ha	10 ha

Option	Raw	With multiplier	Prohibited
B	60 ha	30 ha	10 ha
C	60 ha (discretionary) 10 ha (non-complying)	30 ha (discretionary) 2.5 ha (non-complying) Total: 32.5 ha	0
E	70 ha	35 ha	0

Last step - summarise the assessed hypothetical aquaculture area for each option. These are the figures used in the evaluation table.

Management option	Oyster	Mussel and mussel spat	Fin fish
Option A: Plan Change 4	57.5	235	30
Option B: Extensive prohibited areas and permissive for existing aquaculture	57.5	235	30
Option C: Passive and flexible approach to aquaculture	57.5	440	32.5
Option E: Highly permissive and passive promotion	57.5	527.5	35

14.4 Appendix 4 - Evaluation of new and extended mooring areas

This section outlines the recommendations and rational for zoning areas within the CMA for mooring. It looks at the appropriateness of new mooring areas and extensions to existing mooring areas. In the Bay of Islands, the mooring areas assessed below were suggested in the Moorings and Marinas Strategy for Northland[2]. Outside the Bay of Island, new and extended mooring areas were identified by the regional council's Maritime team. A number of assumptions were made during the assessment process. These are outlined below:

Assumptions

- All mooring zones considered in this assessment have physical attributes that make them suitable to be a mooring zone. Potential areas that are not suitable in terms of their physical attributes have been screened out by the regional councils Maritime team.
- If an existing or proposed zone has an adverse effect on a significant marine area, the zone is inappropriate for expansion and should not be included in the new plan.
  - Existing or proposed mooring zones within 500m of a Significant Maine Area will be assessed by a suitably qualified professional (such as a Registers Landscape Architect) to establish the potential for adverse effects on the values and characteristics of these areas.
- That existing 500m of separation between vessels and marine farms is adequate separation to manage the risk sewerage discharges pose to marine farms. The Resource Management Act (marine pollution regulations) 1998 specifies that untreated sewerage should not be discharged within 500m of a marine farm. While discharging untreated sewerage within a mooring zone is not allowed, anecdotal evidence suggests that untreated discharges still occur from time to time and there is potential for these contaminants to have an adverse effect on marine farms.
- Likely demand is based on council staff experience, forecast population growth in the surrounding area and likelihood of growth in Auckland resulting for demand for mooring space. Demand is estimated over a 10 year period.
- Land based services - Only 50 percent or less of the vessels in any given mooring area will be utilised at any one time. Therefore land based services only need to cater for 50 percent of the vessels.[3]

Attributes

Attribute	Scale
Effects on important anchorage areas	1- in an area identified as a Regionally Significant Storm Anchorage 2- in an area identified as a Regionally Significant Recreational Anchorage 3-outside identified regionally significant anchorage areas
Separation from marine farms	1- within 500m of a marine farm 3- more than 500m of a marine farm
Land based services	1- No land based services 2- limited land based services, or mooring holders can provide their own services or there is space to provide the services

2 *Northland Regional Council, 2014 Moorings and Marinas Strategy for Northland*

3 *This is consistent with the approach taken in the Far North District Plan*

Attribute	Scale
	3- Adequate services exist
Likely demand	1- low demand 2- moderate demand 3- high demand
Separation from Significant Marine Areas	1- less than 500m of a Significant Marine Area (outstanding natural character areas, outstanding natural features and landscapes) 3- more than 500m of a Significant Marine Area (outstanding natural character areas, outstanding natural features and landscapes)

Proposed new and extended mooring zones

A number of mooring zone extensions and some new mooring zones have been proposed to cater for mooring demand over the next 10 years. All the areas suggested have been assessed to ensure they are physically capable of safely accommodating moorings. Any areas that do not have sufficient depth, shelter of suitable bathymetry have been 'screened out' and are therefore not assessed in the table below. As well as being physically capable, mooring zones must be appropriate in terms of their effects on other activities and their effects on the natural values such as natural character and outstanding landscapes.

The table assesses each of the suggested mooring zones to determine their appropriateness.

Proposed new and extended mooring areas

Attributes	Within 500m of a Significant Marine Area	Availability of land based services	Effects on important anchorages	Within 500m of a marine farm	Likely demand
Mangawhai	1	2	3	3	3
Blind Channel (Whangarei Harbour)	3	2	3	3	2
One Tree Point (Whangarei Harbour)	3	2	3	3	2
Ngunguru	1	2	3	3	2
Ngawai Bay	1	2	3	3	2
Whangaruru South	3	2	3	3	2
Whangaruru North	3	3	3	3	2
Waipiro Bay	1	2	1	3	2
Te Uenga Bay	3	2	3	3	3
Matauwhi Bay	3	3	3	3	3

Attributes	Within 500m of a Significant Marine Area	Availability of land based services	Effects on important anchorages	Within 500m of a marine farm	Likely demand
Windsor Landing	3	3	3	3	3
Whangaroa	3	3	3	3	2
Totora North	3	1-2	3	3	2
Mangonui	1	1-2	3	3	3

Summary of recommendations made

Mangawhai

It is proposed additional mooring space is created between the two mooring areas at Mangawhai and to adjust the MM4 area boundary to better reflect where the moorings are currently located. It was originally proposed to create an additional 4ha of mooring space in Mangawhai to allow for existing moorings to be re-organised and to allow some new moorings to be placed. However for the reasons outlined below this has been reduced to 1.49 hectares.

The proposed mooring extension is within 500m of the Mangawhai sand spit, which is designated as having Outstanding Natural Character and Outstanding Natural Landscape values. The potential effects on these values was assessed by a landscape architect who determined that connecting the two mooring areas would have a moderate effect on the natural values of the sand spit because the northern portions of the proposed extension are close to the spit. However the southern portion of the proposed extension is further from the sand spit and does not adversely affect the values of the spit.

The proposed extension will provide for approximately 2-3 new moorings as well as the relocation of 2-3 moorings from other parts of the harbour. This will require approximately 3 car parks and space for 3 dinghy's to be stored. The adjacent land is council reserve with pedestrian access via Findlay and Eveline Streets. Both are narrow residential streets with limited informal parking in the road reserve. There are no rubbish or toilet facilities in the immediate area. In short the provision of land based services is the limiting factor. If mooring holders take their rubbish home, store their dinghies on the council reserve (without obstructing pedestrians) and park in the road reserve, the area can accommodate the small number of moorings proposed.

One Tree Point

Three extensions to the One Tree Point mooring zones have been assessed . Extensions are intended to cater for existing and future demand as well as to provide space for re-alignment of some of the existing moorings. There is adequate parking provided along the road reserve to provide for the existing moorings and to cater for the proposed growth. Whangarei District Council no longer provides rubbish bins or rubbish collection for many of its coastal reserves. There is no public rubbish bins at One Tree Point, meaning that mooring owners will need to take their rubbish home with them.

Dinghy's can be stored on the beach front reserve, above the high waterline without inhibiting access to the beach. While there is ample room for dinghy storage, when staff visited the site there were very few dinghy's stored on the reserve, indicating that most mooring owners take their dinghies home with them.

The proposed extensions to the One Tree Point mooring zones could provide for up to 8 new moorings and some existing moorings that are currently outside the mooring zone. This mooring extension adjoins a coastal commercial zone. Feed back from North Port indicates that providing for additional moorings in the area is likely to result in at Blind Channel and approximately 20 moorings at One Tree Point West.

Parua Bay

Changes to the Parua Bay mooring zone are proposed to create clear fairways and make room for an anchorage area. The proposal does displace any existing moorings or create additional mooring space.

Ngunguru

The proposal for Ngunguru is to create 4ha of additional mooring space between the existing mooring zones. The proposed mooring space is within 500m of the Ngunguru sand spit, which is considered to have Outstanding Natural Character values and Outstanding Natural Landscape values. The effect the proposal could have on these values has been assessed by a landscape architect, who determined that there is sufficient separation between the mooring area and the sand spit, meaning the proposed extension is appropriate from a landscape perspective.

The additional mooring space can accommodate an additional 2-3 moorings. At this time, there is no public rubbish bins or public toilets near by to serve new moorings. There is adequate space for parking along the road reserve and there is room for informal dinghy storage in the harbour side reserve.

Ngawai (Teal) Bay

Ngawai bay contains 12 moorings in the south eastern end of the bay. This is not a designated mooring zone and is next to a headland with outstanding natural landscape values. The effect of allowing more moorings in this area, by creating a designated mooring zone, was assessed by a landscape architect to determine the effect of additional moorings on the Outstanding Natural Landscape values of the adjacent headland. The analysis determined that providing for more moorings in this area would have adverse effects on these values.

For that reason, the proposal to create a mooring zone around the existing moorings at Ngawai Bay and provide for a small number of additional moorings will not be carried through to the Regional Plan.

Whangaruru South

In this area, it is proposed to extend the mooring zone to accommodate an additional 6-8 moorings. The moorings are generally used seasonally and are associated with nearby houses. It is expected that land based facilities will be provided by the mooring holders, as they are currently. Access is via the coastal reserve and there is adequate parking adjacent to the reserve to accommodate the additional moorings.

Whangaruru North

Whangaruru north mooring zone is accessed via Wharf Road. The road is narrow and unsealed. While this area provides some of the best shelter and holding in Whangaruru Harbour and has ample water space to accommodate up to 20 new moorings, there is insufficient parking and other land based services to cater for them. It is proposed that up to 6 additional moorings be provided for in this area.

Waipiro Bay

Waipiro Bay contains an existing mooring field and a Regionally Significant Storm Anchorage. The mooring area covers approximately half the bay with the other half being cleared for anchoring.

In order to achieve the level of shelter and depth required to safely moor, the mooring field would need to be expanded toward the northern side of the bay (into the area used for anchoring).

Given that the bay is a popular anchorage, is used to shelter from storm conditions and has therefore been identified as being regionally significant, it is inappropriate to extend the Waipiro Bay mooring field.

Te Uenga Bay

Te Uenga Bay is directly adjacent to Waipiro Bay in the outer Bay of Islands. The Moorings and Marinas Strategy 2014 identifies a mooring extension as an action to be undertaken around 2024. This time frame was based on population projections and past patterns of mooring uptake in the area. Over the last two years demand for moorings in this area has increased significantly. The existing mooring areas at Te Uenga Bay and Waipiro Bay are at capacity. Because of the increased demand for moorings in the outer Bay of Islands a modest extension to this mooring zone is proposed, which would see the south eastern portion of the mooring zone extended to provide for one additional row of moorings. This would accommodate an additional 7 moorings.

Land based services are limited to roadside parking, with additional parking provided on the village green during peak holiday periods. The area does not have rubbish collection or toilets. Dinghy are stored on the council reserve.

For these reasons moorings seeking to establish in the Te Uenga Bay extension area must demonstrate that they can serve the mooring and vessel from a nearby property or that the public facilities have sufficient capacity.

Matauwhi Bay

At the time of writing this report Matauwhi Bay had 161 moorings within the mooring zone and 18 moorings outside the zone to the south west. The Moorings and Marinas Strategy 2014 sets out how water space for moorings and marinas should be managed in the Bay of Islands. In Matauwhi Bay, the Strategy states that moorings within the existing mooring zone could benefit from some re-organisation and once the area is as efficient as practical and there is demand for more moorings, the mooring zone could be extended outside the bay.

Discussions with councils maritime officer indicates that the existing mooring zone is as efficient as is practical and there is strong demand for more moorings. Therefore it is proposed that the mooring area extension outlined in the Moorings and Marinas Strategy, 2014 is implemented in the New Regional Plan. The Moorings and Marinas Strategy also identifies Matauwhi Bay as an area that would benefit from the use of new mooring technology to more efficiently use space . The use of new mooring technology is not a viable option at this time but may be implemented at a later date.

Kawakawa River

Three mooring extensions are proposed in the Kawakawa River. The extension at the confluence of the Kawakawa River and Waikare Inlet does not provide any additional mooring space. It is proposed to bring existing moorings into a mooring zone. These moorings currently require resource consent but would become permitted activities.

The other two mooring extensions are in the blind channel, near Beaufort Street and opposite, along the eastern bank of the Kawakawa River. Each mooring areas will cater for 6-10 shallow draft vessels. Shore based facilities are currently limited in this area. For that reason new moorings will need resource consent and the ability for mooring owners to provide their own facilities will be a crucial consideration when council decides to approve or decline the resource consent application.

Waikarie Inlet

It is proposed to create a 7 Ha extension to the Okiato mooring field . The extension would provide for the eight existing moorings and up to 4 additional moorings.

Windsor Landing

Windsor landing is an existing mooring zone at the end of Kerikeri Inlet Road on the south side of Kerikeri Inlet. The mooring area contains 28 moorings. The Moorings and Marinas Strategy, 2014 suggests that Windsor Landing should be expanded to cater for the current under supply of moorings in the Kerikeri area. The strategy suggests that Windsor landing could safely accommodate an additional 78 swing moorings.

At this time, the limiting factor for extending the Windsor landing mooring zone is parking and other land based facilities. A proposal to construct a boat ramp and parking area on council reserve at Windsor landing presents an opportunity to create the land based services to serve new moorings in the area. This area is suitable for expansion and final numbers can be confirmed at a later date once details on land based facilities have been finalised.

Whangaroa

Three mooring area extensions are proposed in the Whangaroa harbour. The extensions provide for the mooring zones to be reorganised to provide for a potential marina extension, fairway and to provide for mooring demand. The mooring extensions will provide for 8 -10 additional moorings, which will require storage for 4 dinghy's along the coastal reserve and 4 car parks. The area is well served by public car parks, which are adequate to cater for the additional demand.

Totora North

Totora North mooring zone is on the north coast of the Whangaroa Harbour. The mooring area is accessed via Totora North road, toilets and parking are provided and dinghy's are stored next to the boat ramp. The area is also used to serve the wharf, crayfish factory, residents and day trippers. A lot of activities occur in this small area. Land to provide parking for additional moorings is the limiting factor to expansion of the Totora North mooring area.

An 11ha extension was originally proposed to the Totora North mooring zone. This proposal was intended to cater for new moorings and to extend the mooring area into deeper water to capture existing moorings that have been moved into this area due to insufficient water depth within the mooring zone.

As the land adjacent to the mooring area is already used by existing activities and there is no space to create additional parking, it is recommended that the mooring zone extension be limited to a small (approximately 4ha) extension east of the Motu Kauri Island mooring area.

Mangonui

Mangonui mooring zone is a large and busy mooring area it is proposed to extend the mooring area toward the main channel to make room for one more row of moorings. This extension is to re-organise the mooring area. No additional moorings are proposed and therefore no additional land-based facilities are required.

14.5 Appendix 5 - Existing mooring areas evaluation

This section outlines the rational and assumptions made during the assessment of the appropriateness of all existing Marine 4 Management Areas (mooring zones) within Northland. It concludes that all existing mooring areas should be retained.

Assumptions

- All mooring zones considered in this assessment have physical attributes that make them suitable to be a mooring zone.
- If an existing mooring zone has an adverse effect on a significant marine area, the zone is inappropriate for expansion and should not be included in the new plan.
  - Existing mooring zones within 500m of a Significant Marine Area will be assessed by a suitably qualified professional (such as a Registered Landscape Architect) to establish the potential for adverse effects on the values and characteristics of these areas.
- That existing 500m of separation between vessels and marine farms is adequate separation to manage the risk sewerage discharges pose to marine farms. The Resource Management Act (marine pollution regulations) 1998 specifies that untreated sewerage should not be discharged within 500m of a marine farm . While discharging untreated sewerage within a mooring zone is not allowed, anecdotal evidence suggests that untreated discharges still occur from time to time and there is potential for these contaminants to have an adverse effect on marine farms.
- Likely demand is based on council staff experience, forecast population growth in the surrounding area and likelihood of growth in Auckland resulting for demand for mooring space
- Demand is estimated over a 10 year period.
- Land based services - Only 50 percent or less of the vessels in any given mooring area will be utilised at any one time. Therefore land based services only need to cater for 50 percent of the vessels.[4]

Existing mooring zones

Developing the new regional plan presents an opportunity to review the appropriateness of our existing marine management zones and set out how coastal space will be used over the next 10 years. Part of this exercise looks at the appropriateness of our existing mooring zones to determine if they should be carried over into the new regional plan.

The appropriateness of a mooring zone can be determined by evaluating the following key attributes:

- Physical attributes - level of shelter from wind, waves and swell , depth, bathymetry (bottom type/ holding and slope)
- Land based facilities - Car parking, access, toilets, rubbish collection, dinghy storages
- Impact on important natural areas, marine farms and important anchoring areas
- Demand for mooring space

All the existing mooring zones are physically suitable for moorings and have been used for mooring for a number of years. There are depth/draft restrictions for vessels accessing moorings in the Kerikeri River.

The provision of parking, rubbish collection, toilets and dingy racks is patchy for some existing mooring zones. Some are well serviced and others have very little land based services. This in itself is not always an issue, as a number of the mooring zones are used by local people who provide their own services. However, previous work on the management of mooring zones (mooring management plans) indicates that some mooring zones (e.g. Opua, Opito Bay and Te Uenga) lack sufficient land based facilities to deal with demand over the Christmas holidays and during some long weekends. This does impact on the ability of locals and other people looking to use these areas. While we acknowledge lack of land-based facilities is an issue, sometimes this on its own is not sufficient enough to disestablish a mooring zone, especially in areas with high demand for moorings.

4 *This is consistent with the approach taken in the Far North District Plan*

While demand for moorings may fluctuate in some places, overall demand for moorings has generally been strong over recent years. Most of our mooring zones are at or near capacity. Moorings in Bay of Islands, Mangawhai and Mangonui are highly sought after. It is estimated that the Bay of Islands alone will need an additional 200 moorings over the next 10-15 years.

While there are some issues around the provision of land based services for some of our existing mooring zones, when balanced with ongoing demand for mooring space, the presence of adequate physical characteristics for mooring and the need to provide space for other activities in the coastal marine area, it is recommended that the exiting mooring zones are carried through into the new plan.

14.6 Appendix 6 - Analysis of the impact on the proposed plan on the number of resource consents processed and monitored

Activity Type	Activity Sub Type	Yealy average	Yearly average accounting for readjustment	Current plan rule	New plan rule	Rule change?	Change in RC applications per year[3]	RC Fee/deposit (gst excl)	Total RC fee/deposit	RC application fee - actual (+ 45%) (gst exc)	Labour hours / year processing RC's	Any difference in monitoring between permitted and consented?	Monitoring hours per consent/yr	10 yr average total monitoring hours / year	Monitoring - one-off or ongoing?	Current active	Unnecessary consents
							Staff judgement	*From 15/16 council charging policy*	*change in applications x RC fee/deposit*	*Total RC fee/deposit x 1.45*	*RC application fee / $93 (staff charge out)*	*Only activities where there is a change in RC's assessed*	*Annualised hours per consent. Only calculated for those that answered"Y" to previous question.*	*One-off activities - change in RC's x monitoring hours/consent/yr Ongoing - 10 year average of change in RCs x monitoring hours/consent/yr*	*Only answered if there's estimated change*	*Currently active consents. Only ongoing activities assessed*	*Judgement of consents no longer required. Only ongoing activities assessed*
Air Discharge	Agricultural	0	0	D	D	N	0		$0	$0	0	na	na	0	na	na	na
	Blasting	3	3	D and C	D and P	Y	-1	$729	-$729	-$1,057	-11	Y	3	-3	one-off	na	na
	Industrial	9	9	D	D	N	0		$0	$0	0	na	na	0	na	na	na
	Other	2	2	D	D	N	0		$0	$0	0	na	na	0	na	na	na
	Sewage	35	35	D	D	N	0		$0	$0	0	na	na	0	na	na	na
	Solid Waste	2	2	D	D and P	Y	0		$0	$0	0	na	na	0	na	na	na
Bore Consent	Bore Construction	55	55	D	D	N	0		$0	$0	0	na	na	0	na	na	na
Coastal Air Discharge	Blasting	1	1	D and P	D and P	N	0		$0	$0	0	na	na	0	na	na	na
	Industrial	1	1	D	D	N	0		$0	$0	0	na	na	0	na	na	na
	Other	1	1	D and P	D and P	N	0		$0	$0	0	na	na	0	na	na	na
Coastal Discharge	Industrial	1	1	D	D	N	0		$0	$0	0	na	na	0	na	na	na
	Other	6	6	D	D	N	0		$0	$0	0	na	na	0	na	na	na
	Sewage	1	1	D	D and C	Y	1	$729	$729	$1,057	11	N - Event based monitoring. No difference in consent vs permitted	na	0	na	na	na
	Stormwater	7	7	D and C	C and P	Y	-5	$729	-$3,645	-$5,285	-57	Y	0.5	-39.8	Ongoing	95	80

Activity Type	Activity Sub Type	Yealy average	Yearly average accounting for readjustment	Current plan rule	New plan rule	Rule change?	Change in RC applications per year[3]	RC Fee/deposit (gst excl)	Total RC fee/deposit	RC application fee - actual (+ 45%) (gst exc)	Labour hours / year processing RC's	Any difference in monitoring between permitted and consented?	Monitoring hours per consent/yr	10 yr average total monitoring hours / year	Monitoring - one-off or ongoing?	Current active	Unnecessary consents
	Water to Water	1	1	D	D	N	0		$0	$0	0	na	na	0	na	na	na
Coastal Permit	Deposit Material	4	4	D	D	N	0		$0	$0	0	na	na	0	na	na	na
	Disturb Land in CMA	21	21	D and C	D, C and P	Y	-10	$729	-$7,290	-$10,571	-114	Y	1	-10	One-off	na	na
	Extraction	2	2	D	D	N	0		$0	$0	0	na	na	0	na	na	na
	Marina	0	0	D	D	N	0		$0	$0	0	na	na	0	na	na	na
	Marine Farm	15	5	D and C	D and C	N	0		$0	$0	0	na	na	0	na	na	na
	MM4 Dinghy Pull	0	0	D	D	N	0		$0	$0	0	na	na	0	na	na	na
	MM4 Pile Mooring	2	2	D	D	N	0		$0	$0	0	na	na	0	na	na	na
	MM4 Swing Mooring	33	19	D and P	P	Y	-17	$501	-$8,517	-$12,350	-133	N	na	0	na	na	na
	Non MM4 Dinghy Pull	1	1	D	D	N	0		$0	$0	0	na	na	0	na	na	na
	Non MM4 Pile Mooring	0	0	D	D	N	0		$0	$0	0	na	na	0	na	na	na
	Non MM4 Swing Mooring	26	26	Pr, NC and D	D and P	Y	-10	$501	-$5,010	-$7,265	-78	N	na	0	na	na	na
	Occupy (CMA)	5	5	D	D	N	0		$0	$0	0	na	na	0	na	na	na
	Other	15	15	D and C	D, C and P	Y	0		$0	$0	0	na	na	0	na	na	na
	Pipeline/Cable	3	3	D and P	D and P	N	0		$0	$0	0	na	na	0	na	na	na
	Reclamation	5	5	Pr, NC and D	NC, D and C	Y	1	$729	$729	$1,057	11	Y	?	0	na	na	na
	Structure	91	91	D, C and P	D, C and P	Y	-10	$729	-$7,290	-$10,571	-114	Y	0.33	-80.85	Ongoing	1245 (860 actual charged)	290 (200)
	Surface Water Take	0	0	D	D	N	0		$0	$0	0	na	na	0	na	na	na
	Use Water	0	0	?	?	N	0		$0	$0	0		na	0	na	na	na

Activity Type	Activity Sub Type	Yealy average	Yearly average accounting for readjustment	Current plan rule	New plan rule	Rule change?	Change in RC applications per year[3]	RC Fee/deposit (gst excl)	Total RC fee/deposit	RC application fee - actual (+ 45%) (gst exc)	Labour hours / year processing RC's	Any difference in monitoring between permitted and consented?	Monitoring hours per consent/yr	10 yr average total monitoring hours / year	Monitoring - one-off or ongoing?	Current active	Unnecessary consents
Land Discharge	Animal Waste	57	2	D and P	D and P	Y	2	$729	$1,458	$2,333	25	N Monitored regardless of permitted or consented. Only difference is consents get charged admin fee.	na	0	na	na	na
	Industrial	7	7	D	D	N	0		$0	$0	0	a	na	0	na	na	na
	Other	5	5	D	D	N	0		$0	$0	0	na	na	0	na	na	na
	Sewage	50	50	D and P	D and P	Y	-40	$456	-$18,240	-$26,448	-284	Y	0.40	-150.32	Ongoing	470	376
	Solid Waste	2	2	D and P	D and P	N	0		$0	$0	0	na	na	0	na	na	na
	Stormwater	43	43	D, C and P	D, C and P	Y	0		$0	$0	0	na	na	0	na	na	na
Land use consent	Bridge	1	1	P and D	P and D	N	0		$0	$0	0	na	na	0	na	na	na
	Culvert	3	3	P and D	P and D	Y	2	$729	$1,166	$1,691	18	Y	0	0	na	na	na
	Deposit Material	4	4	??	??		0		$0	$0	0	na	na	0	na	na	na
	Earthworks	51	51	P, C and D	P and RD	Y	-10	$729	-$7,290	-$10,571	-114	Y	3	-30	One-off	na	na
	Extraction	12	12	P, C and D	P and RD	Y	0		$0	$0	0	na	na	0	na	na	na
	Other	3	3	P, C and D	P, C and D	Y	0		$0	$0	0	na	na	0	na	na	na
	Reclamation	1	1	D	D	N	0		$0	$0	0	na	na	0	na	na	na
	River Works	4	4	P, C and D	P, C. RD and D	Y	0		$0	$0	0	na	na	0	na	na	na
	Structure	16	16	P, C and D	P, C and D	N	0		$0	$0	0	na	na	0	na	na	na
	TLA Land Use Consent	5	5	?	??				$0	$0	0	na	na	0	na	na	na
	Vegetation clearance	8	8	P, D and NC	P and C	Y	0		$0	$0	0	na	na	0	na	na	na

Activity Type	Activity Sub Type	Yealy average	Yearly average accounting for readjustment	Current plan rule	New plan rule	Rule change?	Change in RC applications per year[3]	RC Fee/deposit (gst excl)	Total RC fee/deposit	RC application fee - actual (+ 45%) (gst exc)	Labour hours / year processing RC's	Any difference in monitoring between permitted and consented?	Monitoring hours per consent/yr	10 yr average total monitoring hours / year	Monitoring - one-off or ongoing?	Current active	Unnecessary consents
Water Discharge	Animal Waste	81	5	D	D	N	0		$0	$0	0	na	na	0	na	na	na
	Industrial	4	4	D	D	N	0		$0	$0	0	na	na	0	na	na	na
	Other	4	4	D	D	N	0		$0	$0	0	na	na	0	na	na	na
	Sewage	3	3	D	D	N	3	$729	$2,187	$3,171	34	Y	3	9	na	na	na
	Solid Waste	1	1	D	D	N			$0	$0	0	na	na	0	na	na	na
	Stormwater	19	19	P, C and D	C and P	Y	0		$0	$0	0	na	na	0	na	na	na
	Water to Water	3	3	??	??		0		$0	$0	0	na	na	0	na	na	na
Water Permit	Dam	9	9	P, D and NC	P, C, RD, D and NC	Y	-2	$729	-$1,458	-$2,114	-23	Y	2	-4	na	na	na
	Diversion	61	61	P, D and NC	P, C, RD, D and NC	Y	0	$729	$0	$0	0	Not assessed as costs already acounted for by change to earthworks	0	0	na	na	na
	Use water	0	0	??	??		0		$0	$0	0	na	na	0	na	na	na
Water Take	Dam Water Take	3	3	P and D	P and D	Y	0		$0	$0	0	na	na	0	na	na	na
	Geothermal Fluid Take	0	0	D	D	N	0		$0	$0	0	na	na	0	na	na	na
	Ground Water Take	31	31	P and D	P and D	Y	0	$729	$0	$0	0	na	na	0	na	na	na
	Surface Water Take	18	55	P, C and D	P, C and D	N	0	$729	$0	$0	0	na	na	0	na	na	na
Stock exclusion		0	0	P	P, C and D	Y	5		$0	$0	0	Y	2	10	One-off	na	na
Total		856	738	-	-	-	-91	-	-	-$76,921	-827	-	-	-298.97	-	565	456

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