

Methodology - Identifying Regionally Significant Surf Breaks in Northland

Executive summary

Surf breaks are an important recreational asset for Northland, which provide economic and social benefits to the region. The New Zealand Coastal Policy Statement 2010(NZCPS) identifies 17 nationally significant surf breaks and directs how they should be managed. Two nationally significant surf breaks are at Tauroa Point in Northland. There are however, many other surf breaks in the region that may be highly valued and benefit from be recognised in the new Regional Plan for Northland.

Northland Regional Council is considering including provisions in its new regional plan to manage activities that have potential to affect surf breaks. Before we can assess the impact of any proposal to manage surf breaks, we need to better understand the resource, i.e. how many surf breaks there are in Northland, where they are located and why people value them.

This intent of this report is to outline how surf breaks will be identified and how the attributes /values will be identified for each break.

The report concludes that the Wavetrac, New Zealand surf guide and evidence from an expert panel will be used to identify Northlands regionally significant surf breaks. Multi Criteria Analysis (MCA) will be applied by an expert panel to identify the values of each surf break.

The resulting list of regionally significant surf breaks will be included in the draft Northland Regional Plan and will be accompanied by policies setting out how surf breaks or activities that could affect surf breaks should be managed.

Introduction

Purpose

Council intends to recognise the recreational value of surf breaks in their second generation resource management plan¹. The report sets out the methodology to identify Regionally Significant Surf Breaks in Northland.

Aim

1. Identify all the surf breaks that are regularly surfed in the Northland region
2. Establish criteria to identify the values of each surf break;
3. Outline a means to determine the significance of a surf break/set a threshold for regional significance;

¹ Resource management plans are prepared to fulfil councils obligations under Resource Management Act 1991

4. Define terms in order to provide a common language for practitioners and decision-makers.

Assumptions

Research by its very nature contains inherent assumptions and limitations and it is important they are clearly identified.

1. This methodology was designed to account for the relatively scarce availability of data to assess significance. An expert panel was used to populate and score the attributes within this framework as a means to overcome the lack of data and assess the significance of surf breaks in Northland.
2. Surfing is the only value being considered. Surfing includes, body boarding, long boarding, stand up paddle boarding, surf kayaking and body surfing. Wind surfing and kite surfing have not been considered because they require different attributes i.e. different wind conditions.
3. The panel contains suitable experience and expertise to apply the methodology.
4. The attributes are applicable to all the listed breaks and the attributes adequately cover the range of attributes that make any given surf break an important recreational resource.

Limitations

Multi Criteria Analysis has existed in a formal sense since the 1970s and is now widely used as a decision support tool in a wide range of forums. However, as with any methodology, it has limitations.²

Limitations of this project have been outlined and reconciled as far as the science of MCA and its implementation can permit. These matters are below:

Expert Panels

The use of expert panels and the need for subjective decision making by them is challenging. While we endeavor to create an experienced and knowledgeable panel, deficiencies inherent in the use of expert panels exist, including the need for oversight and consistency of application. This limitation is managed, and its effect minimised, by complying with the expert panel selection criteria.

Correlation between attributes

There are likely to be, despite best attempts to reduce this, relationships between some of the primary attributes, known technically as correlation. This is a problem because it can result in double counting of one aspect of a surf break – skewing the significance score, for example popularity and amenity attributes are often highly related. i.e. toilets, shops etc. are present because the place is very popular. The smaller the list of primary attributes, the less likely this is to occur, but when it does occur, results may be influenced.

² Hughey, K.F.D., Baker, M-A. (eds). (2010a). The River Values Assessment System: Volume 1: Overview of the Method, Guidelines for Use and Application to Recreational Values. LEaP Report No.24A, Lincoln University, New Zealand.

The balance between providing an adequate number/diversity of attributes and minimising their correlation is challenging, and some correlation is almost unavoidable. The method separates attributes as far as possible and weighting attributes can be used to explicitly address attributes with, or suspected to have, such relationships.

Weighting Attributes

Attributes can be weighted which means they are adjusted to recognise their greater or lesser 'contribution' to the significance of the surf break. The default in the method is to apply equal weighting to attributes but this may not be correct. The challenge is there is little data about the relative importance of the attributes. Without empirical data, this problem cannot easily be resolved. However, the method does consider and allow for attributes to be weighted. Weighting attributes could be considered when the framework is applied and it should be made clear where weighting has been applied.

Comparative Grades

In developing the method, 'raw' indicator data has been converted to comparative scores which are then aggregated to give a total significance score.

In similar assessments, e.g. the application of RiVAS 1-3, scoring has been used. One of the benefits of this limited grading is that it is simple and can be used to reflect national, regional and local significance.

In the case of surf breaks there are benefits in de-coupling attribute scoring from the planning significance hierarchy (national, regional, local);

1. Nationally significance surf breaks have already been defined in the New Zealand Coastal Policy Statement 2010; and
2. The assessment of surf break attributes needs to be an honest, unbiased assessment. When there is a strong correlation between a given score and a regulatory outcome there is a risk of scoring to achieve the desired regulatory outcome (this may or may not be a conscious bias). De-coupling the score and the outcome should help manage this risk.

Mathematical issues

MCA type analyses assume that all the values lie in what is effectively our 'normal mathematical world', i.e., that all values lie in a comparable and (effectively) linear 'space'. This may not always be true – values may lie in logarithmic or other non-linear spacing, there may be gaps or big jumps between different states of a value, or the differences between states may not even be comparable in an ordinal manner.

There is also the 'apples and oranges' problem when comparing two different values, in that they may not be comparable within our understanding or interpretation of the world, despite having been scored on a similar numerical scale. Mathematical manipulation of values makes further assumptions about the nature and ordinality of the values, and their comparability.

While we cannot know the degree to which this underlying assumption is true, and it does not undermine the value of MCA in laying transparent the heuristic behind a decision, it is important that the assumption underlying MCA is understood.³

³ Hughey, K.F.D., Baker, M-A. (eds). (2010a). The River Values Assessment System: Volume 1: Overview of the Method, Guidelines for Use and Application to Recreational Values. LEaP Report No.24A, Lincoln University, New Zealand.

Definition of terms

Attribute

One facet of the surf breaks value. Taken collectively, attributes *describe* the surf break value. For example, surfing value may include the following attributes popularity, consistency and wave quality.

Determination of significance

The method used to set a significance threshold and relative weightings for each primary attribute. Summing the threshold scores gives a significance score and ranking.

Expert panel

The group of people considered expert in their understanding of surf breaks in Northland which form a panel to score indicators of each primary attribute for a specific value.

Indicator

A measure of a primary attribute defined using SMARTA criteria, i.e., indicators that are specific, measurable, achievable, relevant, timely, and may be already in use.

Indicator threshold

The threshold applied to an indicator to determine high, medium and low relative importance for that indicator. Thresholds, where possible, are quantitatively defined.

Indicator threshold score

Relative importance for each indicator is translated to a threshold score to allow mathematical calculation.

Value

A surf break-related tangible resource (activity or resource use, in this case activities include bogey boarding or surfing etc.), or resource use).

Value category

A specific type or style of the value (e.g., long boarding, short board surfing, learning to surf).

Weighting score

The relative contribution of the primary attribute to the value.

Significance score

The resulting score for each surf break. This is the sum of the indicator threshold scores for each primary attribute (multiplied by their weighting score where weightings are not uniform).

Significance ranking

Surf breaks are ranked based on their significance scores and labelled as significant at regional or local level. Note: nationally significant surf breaks are listed in the New Zealand Coastal Policy Statement 2010.

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.⁴

Establish expert panel

This method is predicated on the use of an expert panel.

Panel members will be experts on surf breaks within the region. Generally speaking surfers will have a good knowledge of their local area. It is also common for surfers to travel within the region to seek out desirable conditions, to surf somewhere different or to enjoy a surf trip.

Experts on the panel should have a strong knowledge of surfing at many breaks around the region. It is unlikely that every member of the panel will have a strong knowledge of every break being assessed. However the panel as a whole should have experienced all the surfbreaks being assessed in a variety of conditions over a number of years. To meet this expectation, the panel will need to have surfed in the region for a number of years.

Expert panel criteria

- Minimum of 10 years surfing in the region
- Regularly surf and surf a variety of surf breaks
- Advanced level of skill (can confidently surf small to overhead waves and complete re-entry, cut backs and tube rides)
- Strong standing within local surfing community

The expert panel will consist of representatives from each of the 6 Board riders clubs in Northland as well as members of the Surfbreak Protection Society⁵. Council staff with experience in Resource Management planning (who are also surfers) will assist with the assessment process.

The defensibility of the method is contingent upon the credibility of the expert panel.

⁴ New Zealand Coastal Policy Statement 2010

⁵ Surfbreak Protection Society is a representative group of surfers and friends dedicated to the conservation of the "treasures" of the New Zealand Surfing Community (and public generally)

Decision making

The panel members will use their experience and knowledge of surfing in the region to identify regionally significant surf breaks using the methodology outlined below.

The panel should be run in a way that encourages discussion, sharing of opinions and experiences of the panel members. This will help draw out the values of surf breaks and inform the assessment. Discussions within the panel should be open and respectful.

The expert panel will be required to make a number of decisions throughout the process. All attempts should be made to reach a consensus decision. Where consensus cannot be reached each panel member should vote for or against a particular outcome. The majority decision will be carried.

In some cases expert panel members may not have adequate knowledge of a break to contribute to the assessment of its values. When this occurs the panel member should make their lack of experience / knowledge of the surf break known to the rest of the panel and abstain from decision making on that break.

Outline of the method

Activity	Step		Purpose
Setting the parameters for surf break assessment	1	Identify attributes	All attributes are listed to ensure that decision-makers are cognisant of the various aspects that characterise the surf break value
	2	Select and describe primary attribute	A subset of attributes (called primary attributes) – these are the attributes that have been selected to determine significance. A synopsis is provided for each primary attribute to inform decision-makers.
	3	Identify indicators	Indicator(s) are identified for each primary attribute using SMARTA criteria. Quantitative criteria are used where possible.
	4	Determine indicator thresholds	Thresholds are identified for each indicator to convert indicator raw data to a score between 0-10.
Surf break assessment	5	Apply indicators and indicator thresholds	Indicators are populated with data (or data estimates using an expert panel) for each surf break. A threshold score is assigned

			for each indicator for each surf break.
Determining surf break significance	6	Weight primary attributes	Primary attributes are weighted. Weights reflect the relative contribution of each primary attribute to the surf break value.
	7	Determine surf break significance	<p>A significance score is calculated:</p> <p>If unequal weightings have been applied to the primary attributes, then multiply the threshold score by the weighting for each primary attribute, and sum the calculations.</p> <p>If weightings are equal, then indicator threshold scores are summed.</p> <p>Order all surf breaks by their significance scores to provide a list of surf breaks ranked by their significance.</p> <p>Apply the regionally significant surf break threshold. Surf breaks with scores higher than the threshold are regionally significant.</p>
	8	Outline other relevant factors	Factors which cannot be quantified but influence significance are outlined to inform decision-making consideration and determine future information requirements).

Setting the parameters for surf break assessment

Step 1: Identifying surf breaks

Output

A list of all the surf breaks in Northland.

Rational

This step requires all surf breaks within the study area to be identified. The list should be as comprehensive as possible to ensure the resource is being accurately assessed.

Who

Council staff to compile an initial list of surf breaks. The initial list will then be reviewed by the expert panel. Additional surf breaks will be added if required.

Notes

1. The Wavetrac New Zealand Surfing Guide is widely recognised as the leading resource documenting surf breaks in New Zealand. This guide should be used in the first instance to identify surf breaks within the study area.
2. While the Wavetrac guide generally includes most breaks commonly surfed it may not include all breaks within the study area. In particular breaks that are isolated, difficult to access, not commonly surfed or are 'secret breaks' are unlikely to be included in the guide. Additional breaks may be added to the list as identified by the expert panel or staff based their knowledge and experience.
3. When identifying surf breaks it is important to be cognisant of break types (beach, point, reef or bar) and whether breaks can be grouped or if they should be assessed separately. Where surf breaks have similar characteristics and are in the same general location they can be treated as one surf break i.e. numerous surf breaks on a beach or multiple surf breaks within a single reef system.

There may also be situations where breaks within a small geographic area should be assessed as separate surf breaks because the breaks have very different characteristics and are therefore valued for different reasons. For example a single bay may contain a beach break and a point break. The beach break may be characterised by short rides with a high break intensity and fast peel angle whereas the point break may be characterised by long rides with a low break intensity and slow peel angle. In this case although the surf breaks are geographically very close to each other they have very different characteristics and values. Therefore the surf breaks should be assessed separately.

Step 2: Identify attributes

Output

A comprehensive list of attributes which attach to the recreational value of a surf break.

Rational

Attributes are identified that describe the nature of the value. The list should be as comprehensive as possible to provide a holistic 'picture' of the recreational value of a surf break.

Who

Council staff to do an initial list and which will then be reviewed by expert panel.

Notes

1. The convention in MCA for developing attributes is to use accepted research/planning/ economic frameworks where ever possible. However in this case the focus on recreational values of one group of users (surfers) and the lack of data means these less applicable.

The use of an expert panel is recommended to identify attributes based on their judgement.

2. Think broadly and comprehensively when defining attributes. If in doubt, list it. Do not be concerned about pragmatism (that the list is too long or data are not available) – those considerations are addressed in later steps.
3. When devising the list of attributes, consider the following factors: quality, rarity, diversity, representativeness, substitutability, connectivity, use levels, social, cultural and economic benefits.
4. Some attributes may be contingent upon others (inter-related). Note as appropriate and try to avoid, in the next step, closely related primary attributes. Attributes may be nested, and it may be necessary.

Step 3: Select and describe primary attributes

Output

Attributes which will be used to represent the surf break value are selected and described. These are called primary attributes.

Rational

The method used to select the primary attributes must be practical, be able to be implemented, be explicit and defensible. Pragmatically, all attributes cannot be considered, therefore a subset of attributes is chosen. If the value under consideration (e.g. surfing) has been divided into categories (e.g. long boarding and short boarding), the same primary attributes should be applied to all value categories.

Who

Council staff, reviewed by the expert panel.

Notes

From the list of attributes outlined in Step 2, select those 'primary' attributes considered most important. These will be used to *represent* the surf break value within the assessment. Document the basis for their selection. Keep the list of primary attributes short (5-10), to ensure the method is practical to implement and easily transferable.

For each selected primary attribute, discuss its validity and reliability, including its strengths and weaknesses, in representing the value.

Step 4: Identifying Indicators

Output

Indicators that will be used to measure the attributes.

Rational

The indicators used to score each attribute should allow for a cost effective quantitative assessment. A hurdle to applying a quantitative assessment to surf breaks is the abstract nature of attributes like wilderness and the lack of data for attributes that can be measured. To overcome this hurdle each attribute will be given a score based on the experience and knowledge of the expert panel. The panel will score each attribute between 1 and 10.

Who

Council staff, reviewed by the expert panel.

Notes

Choose the single most relevant indicator for each primary attribute (i.e., only one indicator per primary attribute). Decisions must be based on the availability of data and relevance of the data. If data are deficient, the best available information and/or an Expert Panel will be used to estimate data (see Step 6). Use SMARTA criteria to select the indicator.

When choosing indicators, return to the list of factors provided in Step 2, that is: quality, rarity, diversity, representativeness, substitutability, connectivity, use levels,

economic benefits. Make sure, in-so-far-as possible, that indicators reflect the four well-beings.

Identify and document the data sources used and the reliability of the data.

Step 5: Determine indicator thresholds

Output

A list of thresholds for each indicator which describe divisions to represent relative importance. Thresholds are defined quantitatively where possible (e.g. >180 surfable day p.a. = high relative importance).

Rationale

Definition of relative importance is a judgmental exercise. The use of thresholds (to quantify the assessment) and the Expert Panel to undertake this exercise (use of best available knowledge) increases the robustness of the approach. Any existing data will inform the Expert Panel's assessment.

Who

Expert Panel

Surf break assessment

Step 6: Apply indicators and their thresholds

Output

A threshold score is assigned by applying the indicator thresholds to these data.

Rationale

The method makes the significance assessment process explicit. The expert panel is used to overcome data deficiencies.

Who

Expert Panel

Action

• Step 6b: Apply the thresholds to each indicator and assign a score: high relative importance 1-10. 10 being the best example of the attribute in the region.

Notes

1. In practice the best examples should be identified by the expert panel in the first to be used as a bench mark. Other breaks should be compared to the benchmark breaks and awarded scores accordingly. Benchmark breaks provide context and provide a starting point for discussion. Scoring Nationally Significant Surf breaks identified in the NZCPS 2010 may also be useful.
2. A spreadsheet is used for these (and subsequent) calculations.
3. Scores will normally range from 1-10, except in cases where the indicator for the attribute can itself score a zero, i.e., the indicator is not present.
4. Difficulty with measurement may cause some primary attributes to be amended or drop out.
5. Document data deficiencies and ensure they are incorporated in Step 10.

Determining surf break significance

Step 7: Weighting the primary attributes

Output

Weightings for the primary attributes.

Rationale

The weighting is a measure of the relative contribution of each attribute to the overall significance of a surf break. For example, if an attribute is a very strong factor in surf breaks being highly values it may be given a weight of 2. Conversely if it is only has a very minor influence then the attribute may be scored 0.5. An attribute with a weight of 2 contributes twice as much to the final score as an attribute with a weight of 1 and an attribute with a score of 0.5 only contributes half as much as an attribute with a score of 1. A score of 1 is the default .

Who

Expert Panel

Action

Determine the primary attribute weightings via the expert panel. These may be equal. If unequal weights are chosen, identify the weighting given to each attribute and record these in the spreadsheet.

Determining Significance

Output

1. An overall significance or importance⁶ score for every surf break. Rank every surf break by its significance score.
2. The list is re-ordered into surf breaks of, regional and local by entering the attribute scores for each break into table xx. The table will then calculate the significance score for each break based on the scores entered and by applying weightings.

Rational

1. The sum of the threshold scores (weighted by relative importance) for each primary attribute will provide a significance score. Every surf break will receive a significance ranking within the list of surf breaks.
2. Using Expert Panel assessment, structured around specified decision support criteria, surf breaks are identified as regionally or locally (see Action step 8b below).

Who

Expert panel

Step 9: Outline other factors relevant to the assessment of significance

Output

Attributes which are relevant to the significance assessment but *cannot be measured* (and are not included as primary attributes) are identified and described.

Rationale

Some attributes do not lend themselves to the style of assessment outlined in this method as they cannot be easily quantified; however, any discussion of significance would be incomplete without their consideration. While these attributes sit outside the scoring process, they should be identified and discussed so that they can be taken into account by decision-makers.

Action

Review the initial comprehensive list of attributes from Step 2. Identify any attributes pertinent to assessment of significance that are not covered adequately within the method. This should consider the following factors: quality, rarity, diversity, representativeness, substitutability, connectivity, use levels, economic benefits.

⁶ Whether to use 'significance' or 'importance' has been debated in the context of both the method generally but also in terms of RMA application. In brief, because 'significance' is a term with specific meaning and application in the RMA it is recommended here that in general the default term should generally be 'importance'. Where the results of the applied method are then translated directly into an RMA application then consideration can be given to using either 'significance' or 'importance'. Both terms are used in the applications reported herein but care is required in their subsequent interpretation and use in policy and planning contexts.

Example

'Potential future recreational use' whereby a surf break may become a recreation resource (in the future) owing to new technology or other changes. A good example from another recreational activity is the development of plastic kayaks, which dramatically expanded the type of rivers that could be kayaked. In the context of surfing the evolution of Stand up paddle surfing may play a similar role. This attribute cannot be encompassed by the method as it cannot be measured; however, it is worthy of consideration by decision-makers.