Annual Report

on the Biosecurity Operational Plan

He Pūrongo Mahi Haumaru Koiora

2022-2023

Northland
REGIONAL COUNCIL
Te Kaunihera ā rohe o Te Taitokerau

Foreword

Welcome to the annual report on biosecurity for the Northland Regional Council.

This reporting year has seen Te Taitokerau facing more unavoidable challenges in the form of Cyclone Gabrielle and the prolonged effects of Covid-19. Despite these, Northland Regional Council and their partners have made significant progress against the strategies set out in the Northland Regional Pest and Marine Pathway Management Plan 2017-2027.

These strategies are delivered through council-led programmes and community-led pest and weed management projects.

Over $2m was allocated towards supporting communities in pest management within High Value Areas (HVA) and Community Pest Control Areas (CPCA). This substantial investment will enable us to continue with vital work to ensure Northlanders aspirations for a healthier environment are realised.

We have continued to build significant relationships with our Te Tiriti partners, with 25 key collaborations during the year. These partnerships are a significant step to empowering iwi and hapū to exercise kaitiakitanga over their whenua.

Established initiatives like the Kiwi Coast Trust Partnership and Predator Free 2050 have continued to flourish during the year and to have a significant positive impact on restoring precious biodiversity, including kiwi, through effective pest control. Meanwhile our community groups like Weed Action – Native Habitat Restoration Trust and the Specialist Weed Assistance Team have produced tangible outcomes, whilst initiatives like Biofunds and the HVA programmes continue to deliver.

Our Environmental Awards during the year once again highlighted the significant contribution made to Te Taitokerau by individuals, community groups and industry. These Awards also recognise emerging environmental leaders, such as Noah Edwards, and it is heartening to see a new generation committed to conservation and environmental protection.

Introduced pests continue to be a major issue for Te Taitokerau, with fresh challenges posed during the year by a new incursion of the invasive seaweed Caulerpa in the Bay of Islands, and by the presence of tropical army worm and fall army worm. The invasive freshwater gold clam has now been found in Waikato and significant efforts are underway to prevent the spread of this pest and its threat to our waterways.

The Northland Regional Council is grateful to all those involved in safeguarding the environment in Te Taitokerau, from community members to scientists to frontline workers. This report serves as a record of those endeavours, a measure of our collective progress and a call to our future actions.

Our Northland – together we thrive

Jonathan Gibbard, Tāhūhū Rangapū - CEO
Northland Regional Council

Geoff Crawford
Chair Biosecurity and Biodiversity Working Party

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1. Introduction
Timatanga kōrero

Background

The Northland Regional Council (council) is the management agency responsible for developing and implementing the Northland Regional Pest and Marine Pathway Management Plan 2017-2027 in accordance with the Biosecurity Act 1993 (Pest Plan). The Pest Plan is a combination of the eradication or effective management of specified pests (or groups of pests), and a marine pathway plan designed to prevent and manage the spread of harmful marine organisms via boat hull fouling within Northland coastal waters.

An Operational Plan is prepared and reviewed annually as a requirement of the Biosecurity Act 1993 (section 100B). It describes how the Pest Plan will be implemented for a given year. Council has a statutory requirement under the Act to report on progress in implementing the Pest Plan within five months of the end of the relevant financial year.

This Annual Report on the Operational Plan 2021-2022 is the fourth produced under the 10-year Pest Plan. The report notes progress made against aims, objectives and performance measures contained in the Operational Plan and expands on these where appropriate. This report should be read in conjunction with the Operational Plan 2021-2022 and the Northland Regional Pest and Marine Pathway Plan 2017-2027.

Practical Pest Management

Pest management delivery is undertaken by Council in the following areas:

Partnerships	Pest animal and weed projects with communities, iwi and hapū.
Pest Plants	Pest Plant control and enforcement led by Council, focused on preventing the spread and establishment of low incidence species and reducing impacts of sustained control species.
Incursions & Response	Delivery of: - Wild animal control - Incursion response - Freshwater pest animals and the Check, Clean, Dry programme
Marine	Eradication and control of marine pests
Kauri Protection	Regional actions to protect kauri and to meet the objectives of the kauri national plan.
Predator Free 2050	Whangārei and Bay of Islands (Pēwhairangi Whānui) projects

Council achieves practical pest management by:

- Requiring residents to adhere to pest or pathway management rules
- Undertaking inspections of properties and places
- Carrying out direct control (service delivery) of high threat pests where council is best placed to coordinate control efforts
- Promoting awareness and providing education and practical advice to residents on biosecurity issues and actions.
- Supporting community-led pest management activities through non-regulatory approaches such as council's biosecurity partnerships.

2. Pest Species in the Plan
Ngā riwha katoa i te rautaki

How are pest species determined?

Many organisms in the Northland region are considered undesirable or a nuisance. Criteria set out in the Biosecurity Act 1993 must be met to justify regional intervention in managing them as pests. Evaluation details can be found at : **https://www.nrc.govt.nz/resource-library-summary/plans-and-policies/pest-management/**

NUMBER OF SPECIES (OR GROUPS OF SPECIES) IN THE PEST PLAN						
	Exclusion	Eradication	Progressive Containment	Sustained Control	Banned from sale or distribution	Total
Plants	13	22	5	18	35	93
Animals	11	3		12		26
Diseases				1		1
Fresh water	3	8	3	2		16
Marine				7		7
Total	27	33	8	40	35	143

3. Financial Summary
Whakarāpopoto ā pūtea

Funding was received from the following external agencies:

Ministry for Primary Industries:

Manchurian wild rice control $352,848

Wilding pine removal $920,000

Kauri Protection of approximately $300,000

Marine incursions $112,633

Biosecurity incursions $35,000

Department of Conservation:

Wild Deer programme for Northland $50k

Whangārei District Council:

Urban Pest Control $50K

In addition, $1,843,314 of external funding was drawn down for Predator Free F2050.

Biosecurity Activities 2022- 2023	Budget (revised)	Actual	Variance
Expenditure	$14,683,522	$13,124,534	$1,558,987
Revenue	$12,477,470	$11,239,279	-$1,238,191
Operational deficit/ surplus	-$2,206,051	-$1,885,255	$320,796

4. Community Engagement and Bicultural collaboration

Performance Measure	Result	Details
Bicultural collaboration The number of relationships or collaborative projects underway with hapū, whānau or iwi increases by a minimum of 5% annually.	**Achieved** 25 collaborations in 22/23 up 5 from the previous year	At the end of June 2023, the Biosecurity team had new and strengthened collaborative relationships established with hapū, whānau or iwi as follows: • Te Rūnunga o Te kao / Te Aupōuri iwi – Wilding confiers • Ngāti kuri – wilding conifers • Pātaua Tiaki Whenua Project Community Pest Control Area • Aki Tai Here – pest plants and PF2050 • Whirinaki Toiora Trust – Kaimahi for nature support • Patuharakeke - Piroa brynderwyn High Value Area, Kauri protection and marine biosecurity • Te Uri o Hau - Piroa brynderwyn High Value Area and Kauri protection • Ngati Torēhina; Ngati Rehia; Patukeha; Ngati Kuta - PF2050 • Ngati Tirairaka o Ngati Hine – Restoration of Motatau Maunga and Kauri protection • Ngapuhi – Kauri protection • 3B2 Trust Rāwhiti – PF2050 and Kauri protection • Te Rarawa – Kauri protection • Ngāti Torehine ki Matakā • Te Waiariki – Marine biosecurity • Te whanau a Rangiwhaaku • Te Kapotai • Ngāti Kororā • Ngāti Takapari • Ngāti Rehia • Te Parawhau • Patukeha • Ngāti Kuta • Te Uri o Hikihiki • Ngai Takoto • Te Roroa
Bicultural capability All permanent staff will have achieved competency level 1 in council's Te Whāriki workshops.	**Achieved**	All permanent staff in the Biosecurity Group have achieved competency in level 1 of the Te Whāriki workshops, or in the case of recently employed staff they are booked in for this training.

Events

During the year many events were cancelled or unable to run due to Covid-19 illness and Cyclone Gabrielle. Events are a vital part of the community engagement work carried out by the council biosecurity team and it has been difficult navigating two years of Covid-related restrictions and extreme weather events.

The team looks forward to a reinvigorated events season in 2023-2024.

Pest Control Hub

The Pest Control Hub is the council's interactive portal, reached through the NRC website, that enables the public to identify pests and report them.

There were 93,018 views of the Pest Control Hub homepage between 1 July 2022 and 30 June 2023, in comparison with 85,543 visits in the prior year, demonstrating the increasing success of the Hub as an awareness-raising and reporting tool.

Social Media and Media Engagement

The biosecurity team continues to actively engage via the council's Facebook site, website and with regular media releases.

Performance Measure	Result	Details
Community Engagement – social media Total number of social media interactions is maintained or is greater than the previous year.	**Achieved**	• 41 posts related to Biosecurity published. • 113,226 impressions • 10,919 engagements • 9.6% engagement rate (per impression) 787 post link clicks

Impressions: *The number of times your content was displayed to users.*

Engagements: *Reactions, comments, shares, saves and post link clicks*

Engagement rate: *This indicates how engaged people are with your brand. The industry standards for good engagement rates is between 1% - 5%.*

Post link clicks: *The number of times users clicked on links from your posts.*

Most popular Facebook posts

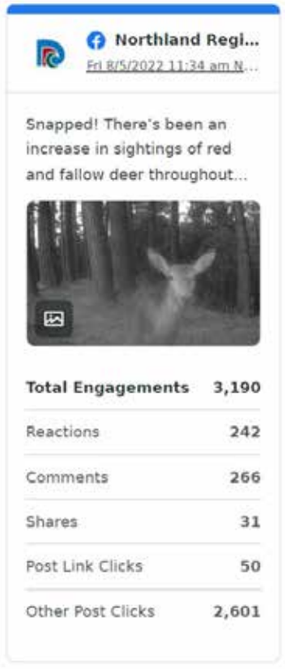
Metrics explained

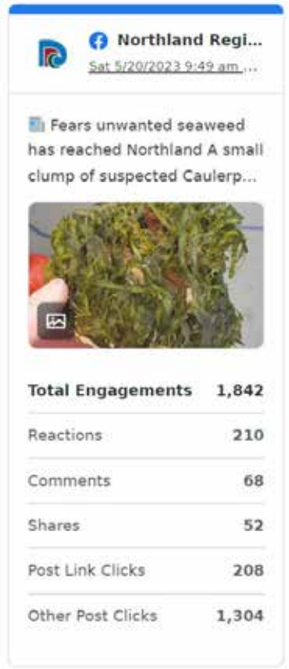
How is our engagement rate compared to other pages?

$$\text{Engagement metric 1} = \frac{\text{Likes + Comments + Shares (for the post)}}{\text{Total Fans}}$$

Industry average = 1% – 2%

Date/Month/Year	Post	Metric 1 Engagement / Total Fans
15 July 2022	Free weeds workshops media release	7.6%
8 August 2022	Sightings of red and fallow deer throughout Northland	26.9%
20 May 2023	Media release on suspected Caulerpa find	15.9%





5. Pest Plants
Riha otaota

0
Exclusion species incursions

64
eradication plant incident reports

16
Biofund projects with a pest plant component

767
Public enquiries

62,303
Wilding pines controlled

9,339
Weed Action volunteer hours

96,498
Pest control hub total page views

For all pest species

1000+
Eradication site inspections

213
Weed workshops participants

1,313 since 2011

5.1 Exclusion plants

Key points of the exclusion pest plant programme

- Enforcement of rules relating to exclusion plants.
- Eradication of exclusion plants found in Northland.
- Inspection and enforcement of rules relating to plant nurseries and retail outlets (National Pest Plant Accord). This performance measure is reported in *Section 5.4 Sustained control plants*

Progress in achieving aims

Performance Measure	Result	Details
Identify new sites Identify new sites of exclusion pests through passive and active surveillance by council staff, the public, or through regional surveillance.	**Achieved**	**Confirmed incursions**: 2020-21: 0; 2021-22: 1; 2022-23: 0
One report of a potential site of Old man's beard was received and investigated and found to be a native *Passiflora* species.		
Incident investigation and response • Initial investigations for all reported sightings and/or discoveries of exclusion species undertaken within 5 working days. • An initial response plan developed and implemented for any new incursion of an exclusion species within 20 working days of confirmation of species.	**Achieved**	Initial investigation of the single potential incursion was undertaken within 5 working days. No infestation was found so no response plan was required.

Old man's beard
As above, one report of a potential site of old man's beard was received and investigated and found to be a native Passiflora species.

Houttuynia management sites
Ongoing surveillance continued at the two existing Houttuynia management sites (three inspections per annum). At the most recent management site (discovered October 2019), no plants were found at any of the three inspections. At the second management site (discovered 2017), 10 seedlings were found on the first visit and treated, and one seedling was found during the second visit and treated. At the most recent inspection no plants were found.

Velvetleaf surveillance site
Annual surveillance was undertaken at the existing velvetleaf management site (a property which received fodder beet seed from a batch infected with velvetleaf seed in 2016) and no plants were observed.

Climbing spindleberry management site
Annual inspection was undertaken at the only known site. No re-growth of the original vine was observed and again, no seedlings were found. It is highly likely this vine was functionally dioecious as this is common for climbing spindleberry, meaning it would not have set seed and the risk of spread from this site is low. However, the source of this vine is still unknown so further targeted digital media and a mail out are planned for next autumn when the foliage of the species is most distinctive.

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5.2 Eradication Plants

Key points of the eradication pest plant programme

- Enforcement of rules relating to eradication plants.
- Eradication of listed eradication pest plants found in Northland.
- Inspection and enforcement of rules relating to plant nurseries and retail outlets (National pest plant accord). This performance measure is reported in *Section 5.4 Sustained control plants*

Performance Measure	Result	Details
Identify new sites New incursion sites of eradication plants are identified through passive and active surveillance by council staff, the public, or through regional surveillance.	**Achieved**	**New sites identified** — 2020-21 / 2021-22 / 2022-23 **Bat-wing passionflower**: 39 (6) / 40 (10) / 85 (12) **Cathedral bells**: - / - / 3 (3) **Mickey mouse plant**: 181 (8) / 160 (4) / 57 (9) **Yellow flag iris**: 2 (1) / 9 / 3 (1) **Evergreen buckthorn**: 1 / - / 1 **Spartina**: 1 (1) / 2 (1) / 1 (1) **Mexican feathergrass**: / 4 / **Wilding kiwifruit**: 1 (1) / - / 1 **Firethorn**: 1 (1) / 5 (1) / 7(3) **Akebia**: 1 (1) / - / 3 **Balloon vine**: 1 (1) / - / - **Royal fern**: - / - / 7 Unbracketed figures are the total confirmed new sites identified in the year. Bracketed figures are the subset of the new sites arising from public reports. Six of the royal fern sites are highly reliable reports from a review of other data sources that are yet to be physically confirmed (see below).
The effectiveness of eradication work is predicated on having a high certainty that most infestation sites are known. In 2022 2023 we continued to see increases in the number of sites in the eradications species programmes, originating from public reports, staff review of iNaturalist records, extended search around known infestations and incidental discoveries by staff. Resourcing surveillance work remains challenging, as it sometimes requires priroitising this work over inspection and control work of known sites, but is essential to ensure undetected sites are not continuing to spread and increase the infestation area. The continued significant growth in the number of sites in the largest eradication programmes, bat-wing passion flower and mickey mouse plant highlight the importance of this work and indicate that these programmes are not yet well delimited.		

Eradication species		Identification of new management sites
	**Bat-wing passionflower**	85 new sites were identified in 2022 2023, 12 of which were from public reports. These sites vary in size and represent both new properties within existing infestation areas, and the extension of known infestation areas. The most substantial of these extensions was the detection of a substantial new site outside of the known infestation area in Kaitaia, which significantly increases the number of management sites and the surveillance area. The Whangaroa and Kohumaru known infestation areas have also been substantially increased due to detections during extended search work. Two significant new infestation areas were also identified; The source of seedlings previously found in the Whangārei Heads area was located and the surrounding area will need ongoing inspection and control and further delimitation. Following a report from the public, a potentially very large infestation area in the Hokianga was confirmed, the source of which appears to have been in the area for a long period. Initial survey work and control work was undertaken but further delimitation is still required and will require additional resources to complete.
	**Cathedral bells**	Three new sites, unrelated to current known sites, were confirmed through public reports.
	**Evergreen buckthorn**	One public report was investigated but was not evergreen buckthorn. One new site, where seedings were present, was added during inspection of properties adjacent to known sites.
	**Field horsetail**	No new sites.
	**Firethorn**	Seven new firethorn sites were confirmed, three from public reports and four from staff/contractors identifying sites in the field.
	**Mexican feather grass**	No new sites.
	**Mickey mouse plant**	57 new sites were identified in 2022-2023, nine of which were from public reports. These sites were primarily within or close to existing infestation areas and represent bird dispersed spread from these areas, however there were some infestations identified in new areas and more significant range expansions. In most locations we need further surveillance work around these sites. The increasing scale of this programme makes it difficult to resource the necessary control and survey work within existing capacity and a review of the programme targets is needed following the testing and roll out of the new GIS platform.
	**Nutgrass**	Two public reports were investigated and found to by species other than nutgrass
	**Spartina species**	A second site was identified in the Mangawhai harbour from a public report. Staff also undertook further delimitation within two known infestation areas in the Kaipara harbour and confirmed new infestation points in these areas. The survey work in the far north harbours is still awaiting additional staff capacity, with the start of the new pest plants officer role for this area delayed until 2023-2024 (role was temporarily re-purposed).
	**Yellow flag iris**	Two new sites identified by staff. One site confirmed from a report from the public. Extended search at existing sites resulted in a range extension for one site.

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Performance Measure	Result	Details
Incident investigation and response Initial investigations for all reported sightings and/or discoveries of eradication species undertaken within ten working days and control actions completed within 20 days.	**Not achieved**	<table><tr><th></th><th>2020-21</th><th>2021-22</th><th>2022-23</th></tr><tr><td>**Incidents reported**</td><td>34</td><td>22</td><td>64</td></tr></table> Of the 64 incident reports responded to, five took longer than the target time for inspection/ control actions to be completed. The probable royal fern sites that were identified in a review of other data sources have also yet to be surveyed.
Due to capacity, the workload posed by the existing known management sites, and the distance of some reports from where staff are based, it is still difficult to be able to complete inspections and control actions for all reports within the target period. For efficiency's sake, depending on the risk posed by a site, staff will combine incident inspections and control with other scheduled control work rather than make an individual trip to the site of a report. The probable royal fern sites that were identified in a review of other data sources that are yet to be surveyed represent a significant amount of survey effort in quite remote wetland areas. It will likely require support from the biodiversity team and DOC to progress this work.		

Performance Measure	Result	Details
Best practice management All management sites visited on scheduled best practice rotation *(based on biological characteristics of each species and defined in the species programme record in the council's IRIS database).*	**Achieved in part**	Refer species details below.
The frequency of inspection and control for management sites of eradication species is dependent on the species ecology and the site status. Each species has a target inspection schedule that would reduce the risk of plants reaching maturity between inspections based on the growth rate and likelihood of plants being missed in the previous inspection. Prior to the addition of new sites from public reports and extended surveillance work undertaken this year, there were 1511 eradication pest plant management sites, of varying scales, spread across the Northland region that required regular inspection and control on varying rotations. Despite some additional contract resource for the programme it remains challenging to meet the best practice targets for all management sites, for all species, as well as completing surveillance and delimiting work. Budget reallocation has allowed for some further additional local contractor capacity to be developed, which is beginning to help address this, and we have additional capacity becoming available in 2023-2024 with a Pest Plants Biosecurity Officer to be based in Kaitaia (the role was originally anticipated to start in 2022 2023 but was temporarily re-purposed to support the wilding conifer programme. The new geospatial information system that is in development for our low incidence work will also significantly reduce the workload involved in work planning, contract management, data recording, data entry and data analysis. The current database management is very manual, and is extremely time consuming and inefficient and adds significantly to workload. The replacement geospatial database is currently at the initial testing phase, before we proceed to data import, review and cut over. The weather patterns during the spring, summer and autumn period of 2022 2023 were also extremely wet overall, and impacted by multiple extreme weather events. This also had a significant impact on a number of programmes, reducing contractor availability and the number of days with appropriate treatment conditions.		

Eradication plant management site visits 2022 - 2023

Eradication plant		Results	Details
	**Akebia**	**Not achieved**	Best practice was not achieved as all eight sites received only a single inspection and treatment rather than the best practice biannual control.
	**Balloon vine**	**Achieved**	The target annual inspection and control activity was undertaken for each of the two existing large-scale balloon vine management sites (one inspection was undertaken early which put it in the previous financial year by seven days).
	**Bat-wing passionflower**	**Not achieved**	Best practice (triannual inspection/ four monthly inspection rotation) was only achieved for 20% of sites. 75% of sites received two inspections. It remains challenging to resource more than 1250 inspections required per annum to meet the best practice target. The current manual work planning, data recording, data entry and data analysis is extremely time consuming and inefficient and adds significantly to workload. Work continues to build contractor resource and capacity, and the replacement database with spatial data capture, management and reporting capabilities is currently at the testing phase of development
	**Cape tulip**	**Not applicable**	Managed by Ministry for Primary Industries.
	**Cathedral bells**	**Achieved**	Best practice (biannual inspection of active sites) was achieved for all sites except one, which received only one inspection rather than the best practice target of two – however no live foliage was found at this site.
	**Chilean rhubarb**	**Achieved**	The large Chilean rhubarb infestation area, which spans multiple large rural properties received the planned annual survey and control.
	**Evergreen buckthorn**	**Not achieved**	Best practice (annual inspection of active sites) was only achieved for 66% of sites
	**Field horsetail**	**Achieved**	The targeted biannual inspection and control were undertaken.
	**Firethorn**	**Not achieved**	Best practice (annual inspection of active sites) was achieved for 75% of sites. Four active sites did not receive annual inspection and control as staff in the mid north were reassigned to assist with cyclone recovery/flood risk reduction which impacted on inspections scheduled for this period.
	**Gypsywort**	**Not applicable**	Site has been managed by Fish and Game New Zealand. Fish & Game have requested support for 2023 - 2024 to deal with increasing infestation levels, particularly on floating mats of vegetation that can't be easily accessed. Drone spraying to be scoped for 2023 2024.

Eradication plant		Results	Details
	**Lesser knotweed**	**Not achieved**	Best practice not achieved. No inspection undertaken due to restrictions around rail line access and limited response from KiwiRail approved operators. Contract now established for 2023 - 2024 with KiwiRail approved contractor and first round of control completed for 2023-2024..
	**Mexican feather grass**	**Achieved in part**	Best practice (annual inspection of active sites) was achieved for 100% of sites. Two monitoring sites did not receive the planned biennial inspection.
	**Mickey mouse plant**	**Not achieved**	Best practice of biennial inspection and control for active sites and four yearly inspection of monitoring sites has been met for 51% of sites. As new sites are identified through extended search and public reports the increasing scale of this programme makes it difficult to resource within existing capacity and a review of the programme targets is needed following the testing and roll out of the new GIS platform.
	**Monkey musk**	**Not achieved**	One Monitoring site received annual inspection and has been deemed eradicated. The three active sites received only one inspection and treatment visit rather than the best practice biannual control.
	**Nassella tussock**	**Achieved**	The single active property received its annual inspection and 18 long term monitoring sites were searched, of which two were confirmed as eradicated. The monitoring sites are large scale sites on long-term reinspection timeframes (monitoring period to confirm eradicated is 20 years after last live plants detected) , and a selection of these are being inspected every year as staff resources allow. 12 other long-term monitoring sites were not inspected.
	**Nutgrass**	**Achieved**	Best practice of biannual inspection and control achieved. Two inspections were undertaken at the single known management site. No live foliage found.
	**Royal fern**	**Not achieved**	DOC were unable to complete their annual autumn control of the site they manage due to high water levels related to the unusually wet spring and summers. Scheduled control work at the Tekateka site managed by Council was again unable to be delivered by the local contractor due to capacity and weather, so will be managed by staff until contractor capacity issues are resolved (staff have already undertaken initial control of the site in 2023-2024). Survey and control was not able to be undertaken at the third site as staff capacity for the mid and far north remained at 0.5 FTE, based in the Waipapa office. In 2023-2024 there will be a Pest Plants Biosecurity Officer based in Kaitaia who will be able to progress the survey and control work needed in the far north.

Eradication plant		Results	Details
	**Spartina species**	**Not achieved**	Best practice (annual inspection of active sites) was achieved for only 13 % of sites. No control work was undertaken in the Kaipara harbour following a request from one iwi to modify the previous consultation approach. The unseasonable wet and windy weather also impacted on the suitable tides days available for inspection and control work. Sites in the Whangaroa Harbour, Taipā, Mangonui, Rangaunu Harbour, and Pārengarenga Harbour were previously managed by the Department of Conservation but ceased some years ago. Before council staff can recommence aquatic herbicide treatment, full consultation with local iwi and hapū will be required. Additional survey and delimitation will also need to be completed. There was still no capacity to initiate this work in 22-23, as the current council resource to manage and deliver spartina work in the mid and far north remained at 0.5 FTE, based in the Waipapa office, and this role is also responsible for numerous other pest plant species control programmes and community liaison. In 2023-2024 there will be a Pest Plants Biosecurity Officer based in Kaitaia who will be tasked with consultation, delimitation and developing local contractor capacity (this is now underway).
	**Wilding kiwifruit**	-	No previous control sites were able to be prioritised for follow up within existing resources. The risk of regrowth at these previously treated sites is very low as a single control visit is usually sufficient to permanently control isolated infestations. One new infestation was found and controlled.
	**Yellow flag iris**	**Achieved in part**	Best practice (annual inspection and control) was achieved for 90% of sites. Two monitoring sites did not receive their biannual inspection and four active sites did not receive an annual inspection.

Modified performance measure	Result	Details
Progress towards eradication Annual decrease in number of adult plants observed or the infestation area at existing management sites	**Modified measure**	Refer species details in table on following page.

This performance measure is used to determine if current management practices are successful in preventing the maturation of plants (and thereby reducing the risk of spread to new sites), or in reducing the total infestation area. Data recorded are:

- Number of sites with mature foliage – this is as recorded at the most recent inspection.
- Count of adult plants – is data for the entire inspection year.
- Infestation area – measured at the most recent inspection, for species where count data cannot be utilised.

Until the new mobile data collection tools are developed with mandatory fields and units for each species, data collection is still in a transition phase, especially for programmes with sites at a range of scales, where large sites are often recorded by infestation area, and small sites recorded as count data.

It should also be noted that based on current technology, infestation area data is subjective. It relies upon observer skills in assessing both area and density to give an estimation of total infestation area.

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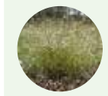
Despite not being able to meet best practice for a number of species programmes, there was still progress made on many of the smaller scale programmes, though several also had new sites detected outside of the known infestation areas. However, for some of the larger and more challenging programmes we are still seeing large numbers of mature plants and new site detections:

- The known akebia sites are under good control but all sites remain at an active status as regrowth continues to be found, with especially older, larger vines and roots resprouting, especially where there is limited foliage to treat. Limited mature foliage was found though. Three new sites were found during 2022 2023, with one more substantial in size.
- The cathedral bells programme has three sites in monitoring status that are nearing eradication status, one active site that is close to status change to monitoring, and two existing sites where live foliage was found. Three new isolated infestations unrelated to existing known infestations were confirmed in 2022 2023 and initial control was undertaken.
- For the two large balloon vine management sites, only 12 juveniles and five seedlings were found at the site that has been under long term management. For the more recently discovered site total area of live foliage was small but there were two plants with mature foliage.
- No new emergence of field horsetail at the one management site during this monitoring period. This species is known to have a long tail to eradication so regular ongoing monitoring will continue.
- Access to the single lesser knotweed site was prevented due to restrictions around rail line access and limited response from KiwiRail approved operators. Contract for triennial control has now established for 2023-2024 with KiwiRail approved contractor to ensure regular treatment can be undertaken.
- No adult plants at any of the Mexican feathergrass sites, and only two with any live plants detected. One further site confirmed eradicated. One historic site still on record with insufficient location information.
- In the monkey musk programme, one monitoring site was confirmed eradicated, one active site had mature growth, one active site had juvenile foliage present and one active site had no live foliage detected with an overall reduction in infestation area.
- The one active site of Nasella had only five small juvenile plants found. Two more long term monitoring sites confirmed as eradicated. All other sites are in long-term monitoring (20 years to determine eradicated).
- No regrowth/seedlings found at the nutgrass infestation site in either of the two inspections this year, the first year the site has been free of live foliage.
- Consistent control at the majority of yellow flag sites saw a decrease in the number of sites with mature foliage present and a decrease in infestation area, with the exception of a range extension at one site found during extended surveillance downstream. This increased the overall infestation area by 500m2. Without this increase the overall infestation area for known sites would have decreased from 539m2 to 369m2. 42 % of sites had no live foliage present. In addition to the range extension, two other new sites were identified, however these were relatively contained.
- Seven new firethorn sites were added to the programme during 2022 2023, two of which are more substantial sites and require further delimiting searches. The number of new sites identified by contractors and staff over the last two years indicate that more resources need to be put into surveillance for this species. Public reporting is usually low as this species is readily confused with many other similar species.
- For evergreen buckthorn, consistent control of sites in the Morningside infestation area has seen good progress toward eradication, however the Matakohe and Sandy Bay infestation areas require additional contractor resource to achieve more consistent control. Part of the Sandy Bay site requires abseil work, and had received regular search and control for a number of years, and the area covered had been expanded. This was unfortunately not able to be completed in 2022-2023 and will be a priority for 2023-2024
- Continued increases in site numbers and adult plants from extended search for Mickey mouse and bat-wing passion flower indicate that these programmes are still not well contained. These are challenging programmes because of their scale, bird dispersal mechanism, and in case of bat-wing, due to its growth rate to maturity requiring sites to ideally be inspected three times a year for more open areas, and twice per year for sites in contiguous bush.
  Eighty-five new sites were recorded for bat-wing passion flower and while only 10% of sites had mature foliage present at the most recent inspection, 27% had mature foliage present at least one inspection during the year, and there was a very high count recorded for adult plants (a large proportion of these will have originated form new sites, however limitations in the database reporting functions meant that count data figures for new sites could not be separated out from existing sites). The newly identified Whangārei and Hokianga infestation areas increase the area that needs to be under management and require further survey and additional resources to pursue control of these sites.
  Fifty-seven new sites were identified for Mickey mouse plant, and a significant amount of additional surveillance around existing sites outside of the Whangārei area is still required. As new sites are identified through extended search and public reports the increasing scale of this programme makes it difficult to resource within existing capacity.

Eradication plant		Year	Number of sites		Number of sites with mature foliage		Count of adult plants		Infestation area	
			Existing	New	Existing	New	Existing	New	Existing	New
	**Akebia**	2020-21	6	2	1 (17%)	1 (50%)			100 m^2	7 m^2
		2021-22	7	0	0	-			43.75 m^2	-
		2022-23	7	3	2 (29%)	3 (100%)			93.5 m^2	52 m^2
	**Balloon vine**	2020-21	1 (large)	1	0	1 (100%)			0.91 m^2	30 m^2
		2021-22	2 (large)	0	1 (50%)	-			3.5 m^2	-
		2022-23	2 (large)	0	1 (50%)	-			4 m^2	-
	**Bat-wing passionflower**	2020-21	272	39	42 (15%)	8 (21%)	176	9		
		2021-22	307	40	29 (9%)	19 (48%)	121	39		
		2022-23	347	85	>44 (10%)	^ Included in existing site data	424	^ Included in existing site data		
	**Cathedral bells**	2020-21	6	0	1 (17%)	-			1,000 m^2	-
		2021-22	6	0	1 (17%)				750 m^2	-
		2022-23	6	3	1 (17%)	3(100%)			20.5 m^2	440 m^2
	**Chilean rhubarb**	2020-21	1 (large)	0	1 (large)	-	26	-		
		2021-22	1 (large)	0	1 (large)	-	26	-		
		2022-23	1 (large)	0	1 (large)	-	49	*		
	**Evergreen buckthorn**	2020-21	48	1	9 (18%)	1 (100%)	44	20		
		2021-22	51	0	10 (20%)	-	40			
		2022-23	51	1	20 (39%)	0%	55			
	**Field horsetail**	2020-21	1	0	0	-	-	-		
		2021-22	1	0	0	-	-	-		
		2022-23	1	0	0	-	-	-		
	**Firethorn**	2020-21	6	1	5 (83%)	1 (100%)	n/a	3		
		2021-22	7	5	2 (29%)	5 (100%)	53	9		
		2022-23	12	7	5 (42%)	6 (86%)	27	25		
	**Lesser knotweed**	2020-21	1	0	1	-			92 m^2	-
		2021-22	1	0	1	-			22 m^2	-
		2022-23	1	0	1	-			50m^2	-
	**Mexican feather grass**	2020-21	2020-21	6	0	2 (33%)	-	6	-	
		2021-22	2021-22	5	4	1 (20%)	4 (100%)	2	41	
		2022-23	2022-23	8	0	0 (0%)	-	0	0	

	**Mickey mouse plant**	2020-21	522	181	47 (9%)	59 (33%)	96	187		
		2021-22	695	160	112 (16%)	54 (34%)	276	124		
		2022-23	855	57	180 (20%)	^ Included in existing site data	369	^ Included in existing site data		
	**Monkey musk**	2020-21	4	0	3 (75%)	-			n/a	-
		2021-22	4	0	2 (50%)	-			295 m^2	-
		2022-23	4	0	1 (33%)	-			80 m^2	-
	**Nassella tussock**	2020-21	33	0	n/a	-	n/a	-		
		2021-22	34	0	1 (2.9%)	-	6	-		
		2022-23	34	0	0 (0%)	-	0	-		
	**Nutgrass**	2020-21	1	0	0	-	-	-		
		2021-22	1	0	0	-	-	-	1 m^2	-
		2022-23	1	0	0	-	-	-	0 m^2	-
	**Royal fern**	2020-21	3	0	1	-	n/a-	-		
		2021-22	3	0	1 (33%)	-	50	-		
		2022-23	3	7#	3(100%)	7#	120	0#		
	**Spartina**	2020-21	120	1	n/a	n/a			n/a	n/a
		2021-22	116	2	n/a	n/a			102150m^2†	2320 m^2
		2022-23	118	1	n/a	n/a			102150m^2†	1 m^2
	**Yellow flag iris**	2020-21	49	2	18 (37%)	2 (100%)			1,291 m^2	3 m^2
		2021-22	48	9	13 (27%)	9 (100%)			539 m^2	69 m^2
		2022-23	60	2	7(11.67%)	2 (100%)			869 m^2	19 m^2

** No new MGS but search area extended*
^ Limitations in the database reporting functions meant that figures for new sites could not be separated out from existing sites for these large programmes
> Figures given for most recent inspection not annual inspection total.
 # 6 probable new sites included in these figures are yet to be physically confirmed/surveyed
†This is an approximate estimate only; Data is incomplete due to areas not under management not having being inspected and infestation area has not been consistently interpreted as extent x density.

5.3 Progressive Containment Plants

Key points of the Progressive Containment programme

- Eradication of plants outside the defined containment zones in Northland.
- Enforcement of rules relating to occupier led control.
- Council will also support communities to reduce the impact of progressive containment pests through non-regulatory biosecurity programmes.

The objectives and rules of the progressive containment plant programme vary by species and location. Control responsibilities are summarised below.

PERFORMANCE MEASURE	RESPONSIBILITY FOR CONTROL	
	Outside the containment zone	Inside the containment zone
African feather grass	Council led eradication	Owner-occupier management to reduce the risk of spread
Pultenaea	Council led eradication	Owner-occupier management to reduce the risk of spread
Mile-a-minute	Council led eradication	No requirement to control
Lantana	Owner-occupier management to reduce the risk of spread	No requirement to control
Manchurian wild rice	Ministry for Primary Industries led eradication, delivered by council	No requirement to control

Progress in achieving aims

Annual status reports

Annual reporting on the status and number of new sites of all progressive containment plants is required in the Pest and Operational Plans. With the exception of Manchurian wild rice, the 2022-2023 status reports are detailed in the performance measure tables below.

The Manchurian wild rice programme is funded by the Ministry for Primary Industries as part of its National Interest Pest Response Programme and is reported on separately and a summary of the programme is reported here.

Performance Measure	Result	Details
Identify new sites New sites of progressive containment plants are identified through passive and active surveillance by council staff, the public, or through regional surveillance.	**Achieved**	**New sites identified** / **2021-2022** / **2022-2023** African feather grass / 0 / 0 Pultenaea / 0 / 1 Mile-a-minute / 24 / 5 (1) Lantana / 3 / 3(1)
Incident investigation and response Initial investigations for all reported sightings and/or discoveries of Progressive Containment species are undertaken within 10 working days and decisions documented within 20 working days.	**Achieved**	**2020-21** / **2021-22** / **2022-23** **Incidents reported** / 4 / 2 / 5

African feather grass
No new roadside sites identified during inspection and control work. Extended search work on properties adjacent to roadside infestation areas (outside of the containment area) remains a priority for surveillance, as resources allow, the current priority being to bring the large scale dune infestation under control.
No delimiting work undertaken north or south of the area already searched for the Pouto dune site, as control work at the known site utilised existing resources.

Lantana
Three new small scale lantana sites were identified and controlled (one through a public report), and the landowners made aware of requirement for follow up control.

Mile-a-minute
A total of five new sites where identified, five by Council officers and one through a public report; one in the Baylys beach, one in central Whangarei, two sites in Mangonui and one site in Paihia. Four other public reports were found to be species other than Mile-a-minute.

Pultenaea
One new site, with a large number of adult plants, was identified through extended surveillance of properties near known infestation areas. Extended search on one large rural property also extended the known infestation area, with significant infestations and adult plants found in new areas.

Performance Measure	Result	Details
Best practice management All Council managed sites visited on scheduled best practice rotation. *(based on biological characteristics of each species and defined in the species programme record in the Council's IRIS database).*	**Achieved in part**	Refer species details below.

Progressive containment plant management site visits 2022-2023			
Pest plant		**Results**	**Details**
	**African feather grass**	**Not achieved**	Contract control at the dune and roadside sites was delayed by weather and contractor capacity, and work was deferred and completed early in 23/24
	**Lantana**	**Not achieved**	Control is undertaken by occupiers, and the programme currently has no set targets for follow up contact with landowners where control or management plans have previously been enforced. New sites are identified, and control enforced or control undertaken with permission, but inspection of previous sites for continued compliance had largely been put on hold because of capacity issues, progressive containment being a lower priority than the eradication work; one site received follow up inspection and control.
	**Mile-a-minute**	**Not achieved**	Best practice (annual inspection and control for active sites) was completed for 74.6% of management sites.
	**Pultenaea**	**Achieved**	Best practice (annual inspection and control for active sites) was undertaken for all sites

Modified performance measure	Result	Details
Progress towards eradication Annual decrease in number of adult plants observed and/or the infestation area at existing Council managed sites.	**Not achieved**	Refer species details below.

This performance measure is used to determine if current management practices are successful in preventing the maturation of plants (and thereby reducing the risk of spread to new sites), or in reducing the total infestation area. Data recorded are:

- **Number of sites with mature foliage** – this is as recorded at the most recent inspection.
- **Count of adult plants** – is data for the entire inspection year.
- **Infestation area** – measured at the most recent inspection, for species where count data cannot be utilised.

Until the new mobile data collection tools are developed with mandatory fields and units for each species, data collection is still in a transition phase, especially for programmes with sites at a range of scales, where large sites are often recorded by infestation area, and small sites recorded as count data.

It should also be noted that based on current technology, infestation area data is subjective. It relies upon observer skills in assessing both area and density to give an estimation of total infestation area.

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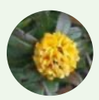
African Feather grass
The Pouto dune infestation remains challenging to treat due to its scale, remote location and difficult access. The contractors are revising their approach and equipment to see if they can improve efficiency. Significant effort was put into the initial delimitation work for this site, but the highly exposed nature of the infestation means there is potential for long range dispersal north and south along the dune system so further survey is required. Roadside infestations are well delimited however there is a risk of further sites existing in suitable habitat in adjacent properties and extended search work on properties adjacent to roadside infestation areas (outside of the containment area) remains a priority for surveillance, as resources allow, the current priority being to bring the large-scale dune infestation under control.

Mile-a-minute
Most isolated sites that have been under consistent control are progressing well toward eradication, with a reduction recorded in overall infestation area, density and presence of mature foliage. However, the Baylys beach infestation area, which was significantly expanded through extended search effort last year, still requires more intensive control effort to reduce infestation area and mature foliage; the bulk of the total infestation area was contributed by sites in this area (952m2), as well as more than half of the sites with mature foliage recorded. Some access issues for staff and contractors are also still being resolved. The other main contributor to the total infestation area was the site on Motukiore island, that staff supported DOC to control this year (250m2).

Lantana
Rather than being eradication, the target for Lantana is zero-density outside of progressive containment zones (where lantana is already widespread), achieved through enforcement rather than council led service delivery. In 2022 2023 there was still insufficient resources to commit to the lantana enforcement programme. Staff find that the enforcement approach is inefficient for small scale infestations, as the time taken to locate owners to undertake the multi-step enforcement process usually outstrips control the control effort required for small garden infestations. Where landowners are home/easily contactable, staff can undertake control with landowner permission, but this isn't possible in a large number of cases. The rule requiring landowners to create a management plan for larger infestations is also somewhat vague and difficult to enforce. The rules for this species have been identified for review when the Regional Pest and Marine Pathways plan is updated.

Pultenaea
Consistent search and control of the known infestation areas has seen continued reduction in the total number of plants and adult plants at the majority of existing sites. However, as resources are available, extended search is being undertaken and this is continuing to identify new sites with adult plants. The known infestation area for one of the existing sites was significantly extended, with 332 adult plants found, and one new site was added through extended search.

Pest plant		Year	Number of sites		Number of sites with mature foliage		Count of adult plants		Infestation area	
			Existing	New	Existing	New	Existing	New	Existing	New
	**African feather grass**	2020-21	27	0	13 (50%)	-			7,823m^2	-
		2021-22	27	0	8 (30%)	1 (100%)			6720m^2	3,925m^2
		2022-23	27	0	12(44%)	-			6800m^2	-
	**Mile-a-minute**	2020-21	45	1	2 (4%)	1 (100%)			121 m^2	50m^2
		2021-22	45	24	10(22%)	7(29%)			372m^2	539m^2
		2022-23	63	5	19 (30%)	5(100%)			1396m^2	141m^2
	**Pultenaear**	2020-21	4	4	4 (100%)	3 (75%)	795	28		
		2021-22	8	0	4 (50%)	-	26	-		
		2022-23	8	1	4 (50%)	1(100%)	341	701		

Manchurian wild rice

The Manchurian wild rice control programme is carried out in partnership with the Ministry for Primary Industries as part of the National Interest Pest Response Programme (NIPR). An annual report is produced as part of the funding agreement and is summarized below for 2022-2023 season.

Work outside of the Progressive Containment (Intransigent) zone

The Manchurian wild rice programme in Northland is focused on the control and eventual eradication of all sites outside of the core high-density river infestation areas known as the 'Intransigent Zone' or Progressive Containment zone.

Progress toward eradication of sites outside of the Intransigent zone can be seen in the change in classification status. The programme uses the "Treatment, Interim, Monitored, Eradicated" (T.I.M.E) classification system utilised by MPI, where Treatment sites have live growth at the last visit, Interim sites have no live growth at the most recent visit, Monitored sites have had no live growth for four consecutive years, and sites designated as Eradicated have had no live growth for 10 consecutive years.

Over the course of the 2022-2023 management period, 22 sites underwent a positive change in classification; 15 Treatment sites were updated to an Interim classification and seven Interim sites were updated to a Monitored classification. Thirteen sites underwent a negative change with 12 Interim sites reverting to Treatment, and one site that was erroneously designated as Monitored instead of Interim corrected to Treatment. Note shifts between Interim and Treatment status are common given the ability of this species to regenerate from underground rhizomes after a period with no love foliage. Data is summarised in the table below.

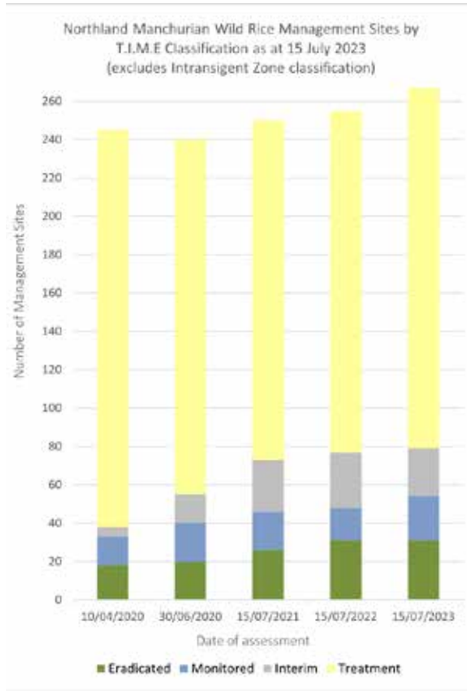
Manchurian wild rice treatment site classification changes

Positive change	2019-20	2020-21	2021-22	2022-23
Treatment to Interim	10	20	14	15
Treatment to Monitored	-	4	-	-
Interim to Monitored	9	4	3	7
Monitored to Eradicated	1	6	5	0
Negative change	**2019-20**	**2020-21**	**2021-22**	**2022-23**
Interim to Treatment	3	1	7	12
Monitored to Interim	-	2	1	1

Nine new sites were identified throughout the year, one through public reporting and eight through extended surveillance work in high risk areas (flood zones) outside of known management sites. All new sites were investigated, confirmed and had trace-back and delimitation work undertaken. At the end of the year there was a total of 267 sites under management outside of the intransigent zone.

The weather patterns during the spring, summer and autumn period of 2022 2023 were extremely wet overall, and impacted by multiple extreme weather events that caused widespread flooding and damage throughout the region. This compounded the already wetter than average weather conditions in the 2021-2022 year. These weather patterns and severe events had a significant impact on the programme, reducing the number of days with appropriate treatment conditions, and had a major impact on the accessibility of some sites due to wet ground conditions and damaged infrastructure preventing access. Unusually high water levels also meant that sites that are normally dry were inundated and could not be treated as they were not part of our planned aquatic treatment work. Despite the challenges, contractors worked hard to prioirtise and deliver this programmes work, and 91% of sites received one round of treatment and 68% of sites received two rounds of treatment.

The below graph gives an overview of the total number and relative proportions of management sites by the 'T.I.M.E' classification status. The positive trend continues, but progress is still slow, reflecting the difficult nature of this species to control. The overall increase in the number of sites is due to the nine new sites found through extended surveillance, and an addiotnal four sites created by splitting existing management sites into smaller units made to improve management and data records.



In addition to the overall site status trends, infestation size can also be seen to be reducing; The adjacent pie chart shows the relative proportions of management sites by infestation area, showing that the majority of sites are now relatively small (≤50 m2), or area sites with little to no live foliage present. Where sites have had consistent control, the height, density and extent of infestations is reducing. Photo A below shows the reduced height and density of a typical pasture infested site that has been under management, as compared to the height and density of an unmanaged site in the Intransigent zone shown in Photo B (inset).

Restrictions around aquatic site control is still preventing full treatment at some large high-density sites, so alternative approaches are being investigated.

Photo A. Showing low density re-growth of Manchurian wild rice in a managed pasture area as compared to Photo B (inset) the height and density of an unmanaged site in the Intransigent zone

Inside the containment (Intransigent) zone

Land occupiers are not required to undertake control of Manchurian wild rice on their properties inside the Intransigent zone. However council staff continue to work with and support landowners to undertake control, by providing advice and information on best practice techniques and some herbicide.

NRC was able to supply, support and provide herbicide to 14 landowners undertaking ongoing control, and 8 new landowners commenced control in 2022-2023.

5.4 Sustained Control Plants

Key points of the sustained control pest plant programme

- Enforcement of rules relating to sustained control plants.
- Enforcement of Good Neighbour Rules[4].
- Inspection and enforcement of rules relating to quarries.
- Inspection and enforcement of rules relating to plant nurseries and retail outlets (National Pest Plant Accord).
- Enforcement of rules relating to road and rail corridors, and development and implementation of management plans relating to the corridors.
- Reducing the impacts of pests that are widespread in suitable habitats throughout Northland. These pests all cause adverse effects to the environmental, economic, social, or cultural values of the region.
- Council will provide education, advice, and support to enable landowners to manage sustained control pests on their properties.

Progress in achieving aims

<table>
<tr><th>Performance Measure</th><th>Result</th><th>Details</th></tr>
<tr><td>Request response time
Response to requests from the public on sustained controlled pests will be responded to within 20 working days.</td><td>Response time data not available</td><td>
<table>
<tr><th></th><th>2020-21</th><th>2021-22</th><th>2022-23</th></tr>
<tr><td>Sustained control pest plant requests</td><td>1,227</td><td>1,098</td><td>767</td></tr>
</table>
The council database reporting system is not currently able to report on request response times and requires modification to capture response data (rather than close date) for this performance measure.
</td></tr>
<tr><td colspan="3">Enforcement requests (incidents)
Of the 20 requests for enforcement of sustained control pest plant rules, 17 were responded to and initial actions undertaken within 20 working days. Note, the majority of these enforcements were not resolved within 20 days because of the enforcement process compliance window must allow for inspection, serving of the Notice, and then a reasonable period for control work to take place.</td></tr>
<tr><td>Road and rail five year weed management plans
All road and rail authorities have 5 year weed management plans or prioritised annual plans approved and implemented.</td><td>Not achieved</td><td>KiwiRail has submitted a draft plan that is being reviewed by Council staff and some areas for amendment have been identified and will work with KiwiRail collaboratively to address these.
Whangarei District Council and Waka Kotahi, the New Zealand Transport Agency plans are expired and have not been revised.
The Northern Transport Alliance (representing Whangarei District Council, Kaipara District Council and the Far North District Council) and Waka Kotahi initially responded positively to discussions and indicated they would progress their plans, however, post the severe weather events in early 2023 no progress has been made</td></tr>
</table>

[4] *Good neighbour rules are designed to address the external effects of pests spilling over from land onto adjacent properties.*

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<table>
<tr><th>Performance Measure</th><th>Result</th><th>Details</th></tr>
<tr><td colspan="3">During 2022 2023, Council staff contacted road and rail authorities on multiple occasions and met with KiwiRail and Waka Kotahi representatives to discuss the renewal or development of their Five-year Weed Management Plans and to offer support for this process. A guidance document was developed (see below) and this was distributed to all Road and Rail authorities.
KiwiRail was the most proactive, and has submitted a draft plan that is being reviewed by Council staff to ensure it meets the objective of the rule, and is a useful tool for the agency.
Discussions with the Northern Transport Alliance (representing Whangarei District Council, Kaipara District Council and the Far North District Council roading teams), and Waka Kotahi, the New Zealand Transport Agency were initially positive, and they undertook to progress these plans to address the lack of compliance. However, following the severe weather impacts on the roading network, staff struggled to get any response to subsequent contacts and no progress was made.
In the earlier discussions it is was still apparent that weed management struggles to gain traction, in terms of focus and funding, against the competing priorities of the safety and resilience of the roading network, exacerbated further by the increasing frequency severe weather events.</td></tr>
<tr><td>Best practice guide
Best practice guide developed for all road and rail authorities</td><td>Achieved</td><td>A guide for developing the Five-year Weed Management Plans (as required under rule 6.4.2.2 in the Northland Regional Pest and Marine Pathways Management Plan 2017-2027), was developed and sent to all road and rail authorities. The purpose of the guide was to ensure the road and rail authorities had the necessary understanding of the principles that should be applied in the development of the plans, and to ensure that plans that are developed are practical, and easily implemented by the practitioners that will be planning and undertaking the work. It also outlined the need for their plans to provide transparency for the public as to the agencies approach and the resources available for the management of weeds in the road or rail corridor. It contains guidance on plan structure, content, target species, prioritisation and control methods and principles.</td></tr>
<tr><td>Plant retail outlet compliance
All known plant outlets in Northland are inspected annually for exclusion, eradication, progressive containment and sustained control species, and species banned under the National Pest Plant Accord..</td><td>Achieved in part</td><td>
<table>
<tr><th></th><th>2020-21</th><th>2021-22</th><th>2022-23</th></tr>
<tr><td>Nurseries inspected</td><td>72%</td><td>44.9%</td><td>64.4%</td></tr>
</table>
</td></tr>
</table>

Plant retail outlet compliance

No nurseries were found to be selling species that are nationally banned from sale and propagation, however four were found to be selling regionally banned species. Of the four, one was a larger nursery that was found to be selling variegated Ivy, a cultivar of Hedera helix that is now a popular indoor houseplant, and Sextons bride (Rhaphiolepis umbellata). The grower destroyed these plants (20 in total) and have subsequently been reinspected. The three other nurseries were small backyard growers/nurseries. Each of the three had a single specimen of a banned species, being rhus tree (Toxicodendron succedaneum), coastal banksia (Banksia integrifolia) and ladder fern (Nephrolepis cordifolia) respectively. These operators were happy for these to be removed and destroyed.

One instance of ivy being propagated to be sold outside Northland (where it is not banned from sale) was found, and the owner has been instructed that they would need to apply for consideration for an exemption if they wish to continue. In addition, three nurseries were advised of the risk of selaginella and/or tradescantia present in corners of the nursery possibly making its way into plants being offered for sale. They agreed to control these species in the nursery. An up-to-date species list of banned plants is provided on all visits. For outlets that are unfamiliar with the list of species that are regionally banned from sale & propagation, further education along with a pictorial handout is provided.

Fourteen of the remaining twenty-one known nurseries were inspected in early July outside of this reporting period.

TradeMe

Trade Me was monitored through saved searches for species banned from sale and propagation (focused on higher risk species and regionally banned species that are more commonly sold, such as agapanthus). No listings for species banned from sale in the Northland region were identified which is a significant improvement from previous years and may be a reflection of the work down previously to have listings removed and sellers contacted.

Salvinia, an Exclusion species for Northland and part of the National Interest Pest Response programme, was identified for sale on a local Facebook page. Staff had the post removed, via a local member of the group, and the seller contacted via the group administrator and the incident was passed on to MPI for management.

5.5 Community Partnerships

In addition to the regulatory work undertaken for pest plants, work continues to raise community awareness and understanding of the threat posed by pest plants, and to encourage and remove barriers to community action, though advice and funding support. This is done primarily through Biofunds, Community Pest Control Agreements, and the High Value Area programme.

The case studies over page highlight the work by three pest plant focussed groups that are supported through the Council's High Value Area programme.

Partnership activity	Details			
Council supported programmes – Biofund Biofunds approved for the community.	**Biofunds**	**2020-21**	**2021-22**	**2022-23**
	With pest plant component	11	7	17
	Total biofunds granted	117	88	77
Council supported programmes – High Value Areas Summary of the engagement work undertaken by the High Value Area Pest Plant groups.	**Community group engagement**	**2020-21**	**2021-22**	**2022-23**
	Volunteer and education events	164	78	344
	Awareness campaigns / media articles	31	24	11
	Recorded volunteer hours	6,505	9,541	9,340
	Landowner site visits, advice, and materials	89	124	148
	Social media posts	160	94	147

CASE STUDY

Weed Action – Native Habitat Restoration Trust

https://weedaction.org.nz/whangarei-heads/

The Weed Action Native Habitat Restoration Trust (WANHRT or 'Weed Action') is a community-based organisation that has been operating on the Whangārei Heads peninsula since 2015. The group is focused on protecting and restoring native ecosystems by removing invasive weeds and preventing the spread. Weed Action do this through several channels; Raising awareness in the community, removing barriers to action, supporting and encouraging volunteer action; working together with tangata whenua, and working with different agencies and advocating for action and resources. 2022-2023 was another busy and successful year for the group.

Through high quality funding applications, WANHRT has been extremely successful in securing significant additional funding ($341,000) to increase the amount of weed control that can be achieved in the Whangārei Heads area over the next couple of years. This is weed control work would otherwise not be undertaken. Weed Action has also helped support the development of local contractor Aki Tai Here Tai. This group is now working independently on both their own whenua and for other landowners in the district and beyond. Aki Tai Here have received awards at the NRC Environmental awards, and together with Weed Action Contractor Mike Urlich, presented at the NETS Biosecurity conference in Paihia, wining best presentation.

An example of the value these initiatives have brought to the Whangārei Heads can be seen in what was achieved on the maunga of Reotahi. Utilising a grant they received from the Lottery Grants Board, WANHRT was able to engage Aki Tai Here to undertake control of a suite of invasive species across 40 hectares of the maunga, that would otherwise have been left to spread and deteriorate further.

The Weed Action coordinator or volunteers undertook a total of 109 landowner contacts, visits or herbicide allocations in 2022-2023 and continue to support and grow the number of active Weed Action' groups that take ownership for different areas on the peninsula and run regular working bees.

The roadside signage campaign continued and a 'Word on Weeds' newsletter was launched, to continue to raise awareness in the community. The successful moth plant pod campaign was run again, along with the popular weed amnesty bin for the community. The group also spent a huge number of volunteer hours developing and improving their own Health and Safety Systems and in May 2023 achieved Sitewise accreditations with a score of 94%. This reflects the groups commitment to keeping all their contractors, volunteers and landowners safe when undertaking their mahi.

Just some of the awesome volunteers that are working to protect the Whangārei Heads area.

Weed Action Whangārei Heads 2022-23	
Volunteer events	29
Landowner engagements	109
Volunteer members	40
Weed Action groups	7
Total volunteer hours	4018.5
Facebook posts	50

Map showing the 40ha where weed control was undertaken on Reotahi (yellow shaded area)

The 'S.W.A.T' team (Strategic Weed Action Team) taking a well earned rest from tackling priority weed sites around the peninsula

Aki Tai Here revisiting an area that prior to their control efforts, was a solid patch of wild ginger

The moth plant pod bin and awareness campaign and competition removed millions of seeds from the Whangārei Heads area

CASE STUDY

Specialist Weed Assistance Team (S.W.A.T) – Tutukaka Landcare

https://tutukakalandcare.org.nz/plant-pests/

S.W.A.T. 2022-2023	
Weed action events	17
Educational events	5
Volunteer members	15
Weed Action Groups	2
Landowner support	12
Total volunteer hours	**237**

Highlights for this year have been:

- Regular Weedy Wednesdays for keen volunteers to meet and make a difference. This enabled the removal of jasmine and planting native trees from Whangarei District Council for planting in Shoebridge reserve.
- Attending the markets and getting great engagement from the community with the moth plant pod collection campaign.
- Support and engagement from neighbours at William Parata Wellington reserve to remove moth plant on private land
- Working with Te Waiora Trust to help control woolly nightshade on their land.
- Hands on educational events with Ngunguru School

Tutukaka markets.

Weed identification with Tai Timu, Ngunguru School.

SWAT volunteers getting the mahi done!

CASE STUDY

Weed Action – Piroa Brynderwyns

https://weedactionpiroabrynderwyns.org.nz/

Highlights for this year have been:

- Significant growth in the number of volunteer hours with 5084 volunteer hours recorded for pest plant control, up from 3,541 last year.
- A focus on climbing asparagus, one of the most invasive and challenging weeds in the Piroa Brynderwyns high value area. Areas worked on have been Mangawhai community park, Waiorahi, and further work at Langs beach reserve.
- The weed control work at Waipu Coastal Walkway and Breve St Reserve had a significant boost from work done by the Wairahi 'trackies' group
- Weed amnesty bin was popular again, raising awareness and encouraging gardeners to 'do the right thing' with getting rid of harmful weeds.
- This year has also seen significant work with schools in the high value area with the development of packages of curriculum based activities that can be undertaken in the classroom, on the beach, in the bush or on school camps.

Weed Action Piroa Brynderwyns 2022-23	
Volunteer and education events	2
Engagement initiatives and media	302
Weed Action groups	12
Volunteer members	112
Landowner visits	27
Total volunteer hours	**5084**

The recipient of the Piroa Brynderwyns 'Weed Warrior' of the year, for a huge contribution to weedy work in the area, including helping to all but eliminate wild ginger from Langs Beach Scenic Reserve.

Waipu Coastal walkway team

CASE STUDY

Wilding pines

https://www.wildingconifers.org.nz/national-programme/

In 2022- 2023, Northland Regional Council was again allocated funding from the National Wilding Conifer Control Programme to control wilding pines in Northland. The programme is also building valuable relationships with Northland's communities and providing local work and training opportunities, whilst helping protect our native biodiversity.

Managed pine plantations are an essential resource in Northland's economy. However, the region's unique dune, gumland, and wetland habitats are vulnerable to invasion from wilding pines. The programme is focused on removing pines from these habitats and controlling key seed sources in and around these habitats. bush or on school camps.

Northland wilding pine control 2022-2023	
Jobs created (new starts)	41
Hours worked	8,570
Full time equivalent staff (non council)	5.49
Contractors engaged	5
Wilding pines controlled	62,303
Area controlled (hectares)	8,617
Number of control sites	15

Wilding pine control at Great Exhibition Bay

To the south of the Parengarenga Harbour lies the unique dunes of pure white silica sands that form Great Exhibition Bay. With limited public access this remote 30km long beach on the East coast of the Aupōuri Peninsula is a natural and outstanding site with unique dune systems, dune lakes, cultural wahi tapu and many endangered plant and animal species. The reserve is jointly owned and managed by Te Aupouri and the Department of conservation.

Pine plantations and legacy plantings have contributed to wilding pines spreading throughout the dune land scape almost to the exclusion of native species.

The Northern end of the bay is formed by Kokota Spit where in 2021 local contractors removed over 2000 wilding pines within a 1400 ha area.

In April 2023 work began on the southern end of Great Exhibition Bay reserve. To date 7,000 wildings have been removed in an area of 400ha.

A culturally and environmentally significant landscape it is hoped that once the initial control work has been completed ongoing pest and weed control by DOC and the local Iwi Te Aupōuri will enable the whenua to regenerate to its natural state.

Kokota Spit Dunes, Great Exhibition Bay after wilding pine control.

NRC staff and contractor son a site visit to Kokota Spit

5.6 Community Engagement

Performance Measure	Result	Details
Community engagement - events Total number of engagement events conducted to increase awareness of plant pests is maintained, or greater than the previous year	**Achieved**	See table below

	2020-21	2021-22	2022-23
Field Days / A&P Shows	1	0	3
Community events	1	1	6
School visits /activities	0	0	2
Stakeholder activities	13	15	12
Pest workshops	8	3	11
	23	**18**	**34**

During 2022-23 (post covid restrictions) the biosecurity team have been able to host or attend events again and this is reflected in the increase in numbers of both events and participants. Events attended included the Kerikeri Garden Safari, Whangarei Garden Ramble, the Whangarei A&P show, the Paparoa A&P Show, Dargaville Field days, Seaweek, Volunteering Northland Open day, and the Parihaka Bioblitz.

The NRC pest plant displays at Dargaville Field Days and at one of the gardens on the Kerikeri Garden Safari. Despite wet weather there were a good number of people through this garden engaging with the display and staff .

Eight weed workshops were also held between July to October 2022 , spread around the region, held in halls and schools, wherever a group of people were keen to learn. Participation was very good with 319 people from young students to retirees enjoying the learning. The lockdowns had possibly encouraged more people to look more closely at the weeds in their surroundings and engendered interest in these workshops. In addition to these weed workshops, two workshops for Madagascar ragwort and fall army worm were held, as well as a 'weed wananga' (continued over page).

Performance Measure	Result	Details

The 'weed wananga' was a learning space created to help groups learn from each other and share information. Each of these groups is working on weeds and using different tactics and approaches to engage volunteers, and obtain funding and support to progress work, and there was huge value in sharing this knowledge. Topics of presentations and discussions included how to use a Facebook page to gain a greater reach and engender more learning, health and safety platforms being developed to help keep volunteers safe and record information, and digital options for recording work being done on weed species in the field.

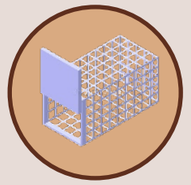
Clockwise from top left; Weed workshop held at Lake Ohia School; Attendees watching a presentation at the Weed Wananga; Weed workshop in Kerikeri at the St Johns hall; and Weed workshop at NRC in Whangarei.

6. Pest Animals
Riha rawaho

2020
Customer requests

1,568
hectares of new CPCAs

71
Biofund projects
487 since 2017



Kiwi numbers have increased from
80→1,115
in Whangārei Heads
Since 2002

225
Kiwi Coast Community Groups actively managing
251,300 ha

708,536
Animals trapped across the Kiwi Coast since 2013

55,523
Pets trapped in High Value Areas

7,189
Pest control devices issueds

60
Event activities

Exclusion animals

Key points of the exclusion programme

- Prevention of seven pest animal species establishing populations in Northland.
- Council and Crown agencies are responsible for control.
- Success is related to fast and efficient response planning and action in the field.

Performance Measure	Result	Details
Engagement events attended is maintained or greater than the previous year	**Achieved**	**Field Days / A&P Shows/ Community Events**: 2020-21: 1; 2021-22: 0; 2022-23: 2

Rainbow lorikeet incursion
Due to lack of suitable specialist contractors and Ministry for Primary Industry staff and resourcing being reprioritised into other significant responses (Cyclone, Caulerpa and Freshwater Golden Clams) progress on response activities has stalled. There was one report in the Mangawhai area in July but nothing further for the year. Northland Regional Council and Auckland Council will monitor the situation for evidence of a population.

Wallaby
There were five reported sightings of wallabies this year. Two were confirmed as other species (a possum and a cat) and the remaining three (in Waipoua, Pukenui and Glenbervie) were unable to be confirmed despite surveillance activities. Following the report by a member of public of a wallaby in Waipoua a full surveillance operation was undertaken with the support from Tipu Matoro/Wallaby Free Aotearoa (MPI). A wallaby indicator dog that can detect wallaby droppings was used through the area, along with the establishment of a trail camera network of 25 cameras, which were deployed for six weeks as per the current protocol. No sign of wallabies were found. A further six-weeks of monitoring using trail cameras was implemented in an expanded range area but to date there has been no further sightings.

A passive surveillance program using a media release at the time of sightings and local signage to encourage reporting has been implemented at both Glenbervie and Pukenui forest with no further evidence or sightings reported.

Identify new sites New incursion sites of exclusion animals are identified.	**Achieved**	**Incident reports**: 2020-21: 8; 2021-22: 4; 2022-23: 3
Incident investigation and response • Initial investigations for all reports undertaken within five working days. • Response plans developed and implemented within 20 working days	**Achieved**	All exclusion pest animal investigations were undertaken within five days and where relevant response plans implemented within 20 working days. The rainbow lorikeet incursion is being led out by MPI under their plan.

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Eradication animals

Feral deer have the potential to establish throughout the region and can cause adverse effects to the environmental, economic, social, or cultural values of the region. Council is either the lead agency or a partner in their eradication. Eradication will be undertaken by the council in conjunction with relevant Crown agencies, tangata whenua, and other stakeholders where practicable.

Regulatory programmes include:

- Enforcement of rules relating to eradication animals.
- Eradication of species listed within the eradication programme.

Non-regulatory services include:

- Support eradications undertaken by other Crown agencies, tangata whenua, and other stakeholders
- Provide advice about how to manage eradication animals
- Support, attend and provide public pest control workshops to raise awareness
- Manage contractors relating to control response for eradication animals.

There are currently four species of deer known to be present in Northland; red deer (Cervus elaphus scoticus), fallow deer (Dama dama), and sika deer (Cervus nippon) and wapiti- red hybrid which have arisen from past farm escapes. Red deer and fallow deer are farmed, and sika deer are present in one area of Northland as a result of illegal releases.

Programme objectives

- The goals of Northland Wild Deer Response Programme 2023-2030 (a collaboration of stakeholders including the Department of Conservation, OSPRI[6], and Northland Regional Council tangata whenua, and other stakeholders).
- has two broad goals:
- To eradicate low densities of wild deer in Northland through deer farmer liaison, fence inspections, surveillance, wild deer response activities and statutory management; and prevent the successful establishment of wild deer populations.
- To increase community awareness of the risks and environmental consequences of feral deer establishing in Northland to gain wide community support for the vision of no feral populations of deer in Northland.

Programme aims

Council will work cooperatively with the Department of Conservation and other stakeholders to achieve the objectives of the Northland Wild Deer Operational plan 2023-2030. Landowners, occupiers, and the public understand the risks and environmental consequences of feral deer establishing in Northland and are supportive of the programme.

[6] *OSPRI is a partnership between primary industries and the government that manages two national programmes – NAIT and TBfree. NAIT provides the National Animal Identification and Traceability system and TBfree aims to eradicate bovine tuberculosis from New Zealand.*

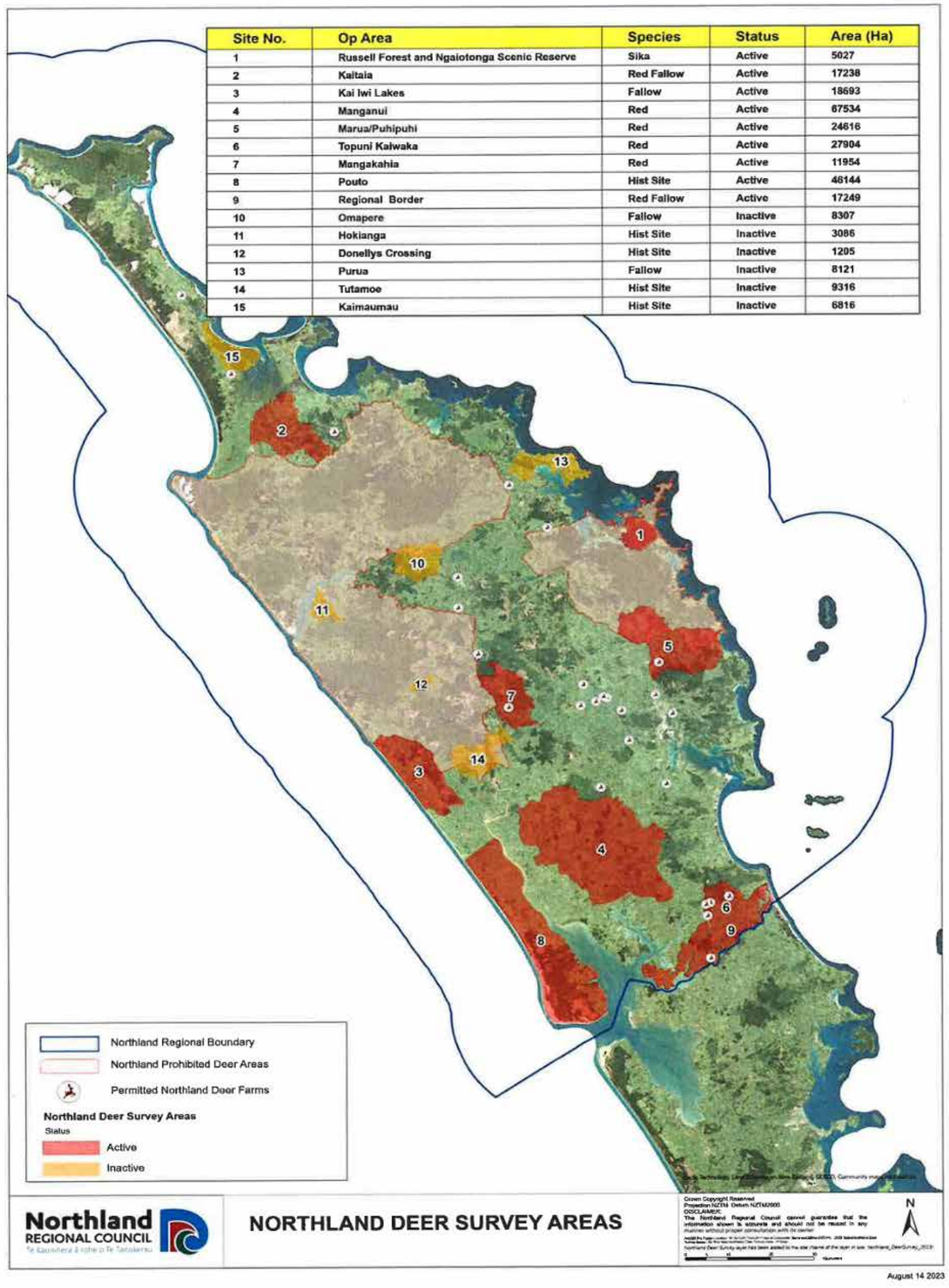
Progress in achieving aims

Performance Measure	Result	Details
Known deer populations are surveyed and mapped across Northland.	**Achieved**	TADS (Thermal Animal Detection Systems) have been completed on 7 sites. Contractor ground surveillance work is ongoing in a continual program mapping population indication or density
Attempt to resolve legal and accountability issues regarding feral deer in Northland.	**Not achieved**	NRC staff are unable to be warranted under the WAC Act (Wild Animal Control Act) DOC are intending to create a full-time deer related role to work through processes under this Act.
100% of deer incidents are responded to within 48 hours.	**Achieved**	NRC staff and Contractor attendance.
Any faults in deer farm fences observed via field inspections that pose a risk of deer escaping are reported to the Department of Conservation within 24 hours for remedial action.	**Achieved**	NRC staff and contractors recorded this information on GIS programs which DOC have access to.

There were 16 public reported deer sightings in the 2022-23 year.

Reporting Month	Animal	Total
Jul-2022	2	2
Aug-2022	0	0
Sept-2022	1	1
Oct-2022	2	2
Nov-2022	0	0
Dec-2022	2	2
Jan-2023	1	1
Feb-2023	2	2
Mar-2023	1	1
Apr-2023	2	2
May-2023	2	2
June-2023	1	1
Total	**16**	**16**

Site No.	Op Area	Species	Status	Area (Ha)
1	Russell Forest and Ngaiotonga Scenic Reserve	Sika	Active	5027
2	Kaitaia	Red Fallow	Active	17238
3	Kai Iwi Lakes	Fallow	Active	18693
4	Manganui	Red	Active	67534
5	Marua/Puhipuhi	Red	Active	24616
6	Topuni Kaiwaka	Red	Active	27904
7	Mangakahia	Red	Active	11954
8	Pouto	Hist Site	Active	46144
9	Regional Border	Red Fallow	Active	17249
10	Omapere	Fallow	Inactive	8307
11	Hokianga	Hist Site	Inactive	3086
12	Donellys Crossing	Hist Site	Inactive	1205
13	Purua	Fallow	Inactive	8121
14	Tutamoe	Hist Site	Inactive	9316
15	Kaimaumau	Hist Site	Inactive	6816



Sustained control animals

Biodiversity restoration projects controlling sustained control pest animals are generally managed through council's Biosecurity programmes. These include:

Biofund (Environment Fund)

Small management agreements and grant funding to establish pest control projects.

Community Pest Control Areas (CPCA)

A way of assisting communities to manage pests on private land.

High Value Areas (HVA)

Specifically identified areas of high biodiversity and/or cultural, recreational or economic value where the community lead and undertake pest control

Predator Free 2050 projects

These are large scale predator elimination and control projects that have been established in Northland in partnership with community, iwi and hapū, and other agencies. NRC is the fundholder for two Predator Free projects in Tai Tokerau, Whangārei and Pēwhairangi Whānui.

Biosecurity Partnerships

Such as the Northland Regional Council – Kiwi Coast Trust Partnership to support and enable coordination of community pest control across Northland.

Council uses regulatory measures when required (rules differ for each animal), such as not holding mustelids in captivity.

Progress in achieving aims

Performance Measure	Result	Details
Land area in CPCAs Increase in land under CPCA protection by 5,000 ha per annum.	**Not achieved**	**New CPCAs (ha)**: 2020-21: 5,732; 2021-22: 7,345; 2022-23: 1,568 New and pre-existing CPCAs are shown in the map overleaf.
New CPCAs initiated during the year were: The number of new CPCAs was considerably lower than in previous years due to heavy rainfall and cyclones that affected landowner and contractor ability to engage and implement management plans.		
Response to reports from public Reports on sustained control pests will be responded to within 20 working days.	**Response time data not available**	**Requests received**: 2020-21: 4,149; 2021-22: 2,865; 2022-23: 2,020

CPCA Name	Area (ha)
Te Arai	1,116
Takahiwai Mātaitai	452
Total area new CPCAs	**1,568**

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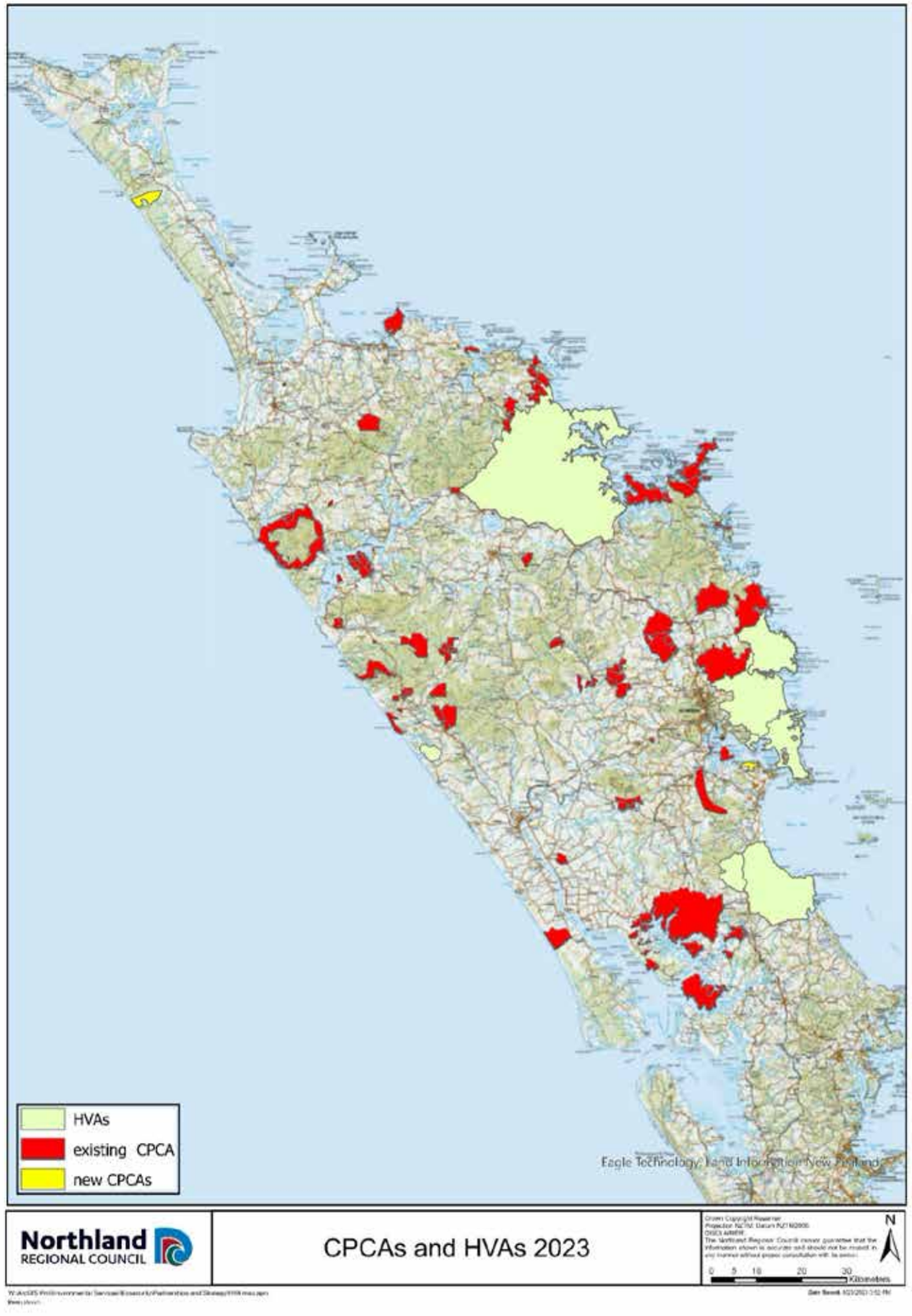


CASE STUDY

Kiwi Coast Partnership – Northland Regional Council

https://kiwicoast.org.nz

The Kiwi Coast celebrated its tenth anniversary since being formed in 2013. The NRC-Kiwi Coast Partnership is now into its second year of the renewed five-year agreement, and we are proud to be supporting this organisation which has continued to provide a platform for community-led groups to realise their conservation goals across Northland.

Over its 10 years in existence, the number of projects linked to the Kiwi Coast has grown from 32 to 225. This equates to a collective area being managed for pests by these entities to over 251,300 ha. Data from these groups show that a record number of 116,952 pest animals were trapped in 2023 – this takes the total number to 708,536. On average, 2,250 animal pests are being trapped per week across the Kiwi Coast.

Importantly, the huge amount of pest control is resulting in the protection of our taonga species. For example, kiwi and pāteke populations are stable or increasing in those areas where integrated long-term predator control, and good dog management has occurred.

Another part of the Kiwi Coast's work is to support and empower new groups. As such, 22 skill building workshops were run by the Kiwi Coast in 2023. These events include trapping workshops, dog management workshops, and a regional pest control hui where people have the opportunity to get together to share ideas, skills, and perspectives.

Although the recovery of kiwi populations across Northland has been a great success story that the Kiwi Coast has played a part in, there is still more work to do to ensure the long-term survival of this species. The Kiwi Coasts strategic aim of continuing to provide safe wildlife corridors via landscape-scale pest control networks across Northland shows no sign of slowing down and will ultimately allow the safe dispersal of taonga species across the region.

Community events since 2013	
Skill building workshops	121
Kiwi event participants	23,267

Right: Backyard Kiwi Project Manager, Todd Hamilton, with Murdoch the kiwi at the Parua Bay release in February 2023.

Kiwi Coast Statistics (calendar year)	2018	2019	2020	2021	2022
Groups working to save kiwi	129	159	187	210	225
Land in active pest management (ha)	155,000	198,000	224,760	241,000	251,300
Animal pests gone (since 2013)	297,753	396,634	492,458	591,584	708,536

Performance Measure	Result	Details
Council supported programmes Number of pest control devices issued, and number of pests trapped	**Achieved**	Over 6,700 pest animal control devices were issued to landowners and community groups in 2022-23. This was slightly higher that recorded in 2021-23 and it was clear that the effects of severe weather and cyclones in the last year has had an impact on the community's ability to engage in pest control, which is also reflected in the slightly lower total numbers of pest animals trapped (see below).

	Mustelids trapped			Total pests trapped		
High Value Area outputs	**2020-21**	**2021-22**	**2022-23**	**2020-21**	**2021-22**	**2022-23**
Mid-North	655	807	919	40,210	43,786	40,661
Tutukākā	49	195	212	2,027	3,788	2,361
Whangārei Heads	38	48	54	947	1,184	874
Piroa-Brynderwyn	271	252	282	3,497	3,751	3,541
KiwiLink		152	195		9,509	8,086
Total	**1,013**	**1,454**	**1,662**	**46,681**	**62,018**	**55,523**

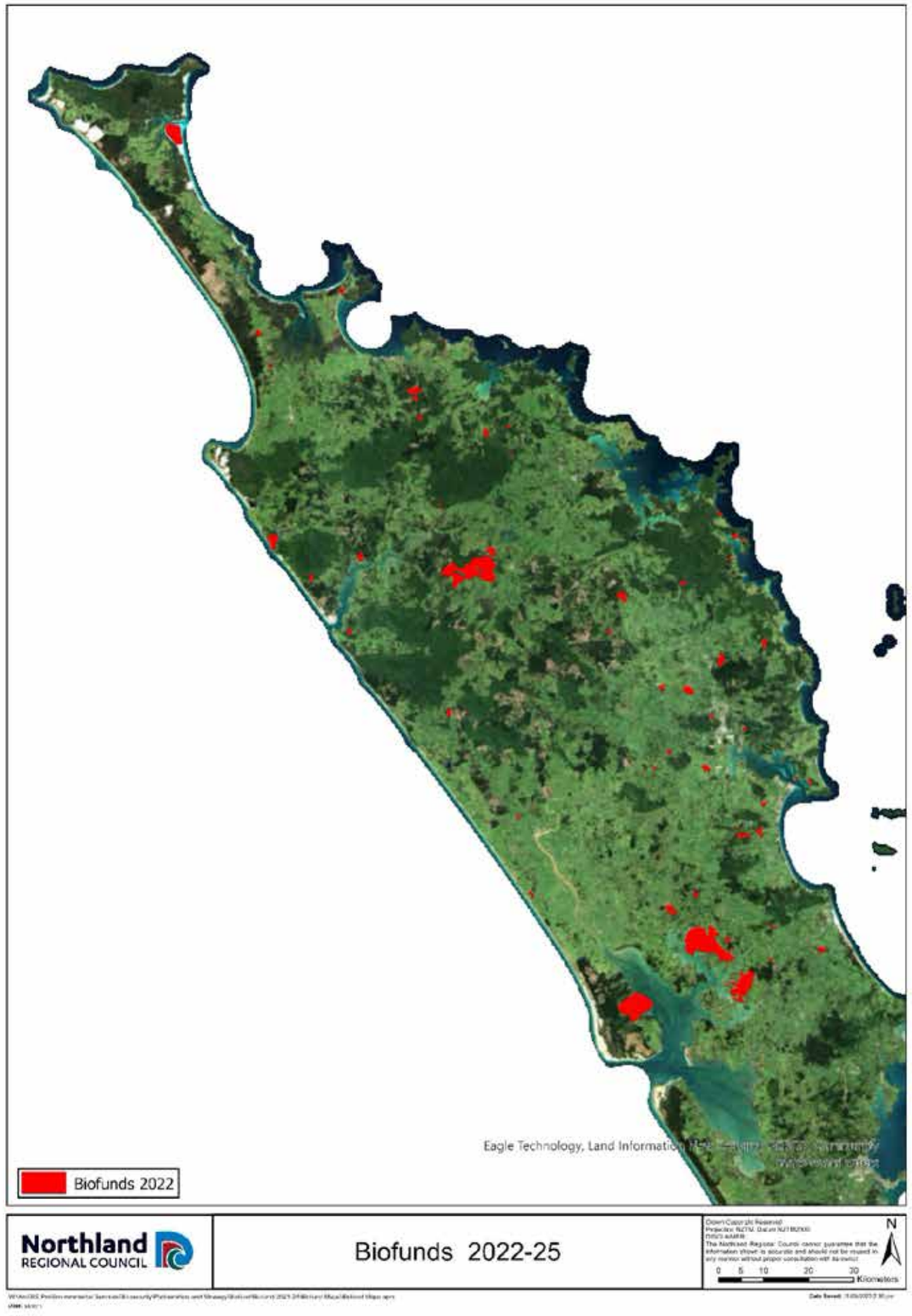
Council supported programmes – Biofund Number of new Biofund grants approved.	**Achieved**		**2020-21**	**2021-22**	**2022-23**
		Biofund projects	117	88	71

Compared to the previous two years, there was a reduction in the number of Biofunds awarded in 2022-23 which was primarily attributed to the number of extreme weather events and cyclones that occurred across the region. Accordingly, this was not an unexpected result.

BIOFUND 2021-2022

71 community projects were granted funding for pest control

Right: Biofund management site at Parangarahu. Here, members of the Waetford family join Biosecurity Officers for a site visit before deploying pest control devices.



Performance Measure	Result	Details
Possum Index Monitoring Contractors specifically engaged by council for possum control will meet a target of 5% residual possum densities in council led operations. Council supported programmes undertaking possum control are achieving agreed targets set in community pest control area agreements.	**Achieved**	There were no NRC funded performance-based contracts for possum knockdowns in 2022-23; however, possum monitoring has been completed in some of the projects where sustained possum control is being carried out using the Waxtag Index (WTI) method: Monitoring using the WTI protocol at Maunganui Bluff following toxin operations between September – November returned a WTI of 18% (i.e., an average of 18% of WaxTags on each transect were interfered with by possums). Annual possum monitoring in the eradication zone on the Purerua peninsula within the Mid North High Value Area returned a WTI between 0-3%, while monitoring across the c. 4,600 ha which buffers the peninsula returned a mean WTI of 15.6%.

CASE STUDY

Enviroschool students with NCEA credit	
2020-2021	121
2021-2022	91
2022-2023	175
Since 2011	1,243

Enviroschools

The Enviroschools Project Pest Control Programme continues to be a huge success, opening-up real opportunities for students, including educational qualifications (NCEA unit standards), career pathways and the potential to make a living from possum fur. The team tutored at three courses held throughout Taitokerau, each consisting of a two-day skills workshop and an assessment day. Overall, 175 Enviroschools senior secondary students took part.

The programme started with Project Possum in 2011 and evolved to include Project Mustelid in 2016 and Project Rodent in 2017. The three initiatives were combined into Project Pest Control the following year and now enjoy considerable success in the battle against pests.

Northland Regional Council (NRC) leads the in-field and theory-based programme, supported by Can Train NZ, local industry and Te Whatu Ora. Students learn about the biology and impact of animal pests and are shown how to trap and kill them humanely, and how to skin possums and machine and hand pluck their fur.

As part of the best practice learning during the two-day skills course, tutors start with the life of the pests, establishing the creatures as living, breathing animals deserving of our respect and humane treatment. Humane leg-hold traps are used to trap possums and the students are taught how to place them and set them to cause the least discomfort to the animal, while also placing the trap beyond the reach of Kiwi.

After a few weeks, to allow for pest control practice and completion of theory work, an assessment day is held. At this workshop, students are put through their paces and investigate a variety of biosecurity career pathways.

Above: NRC Biosecurity Officer demonstrating trapping best practice to secondary students.

High Value Areas

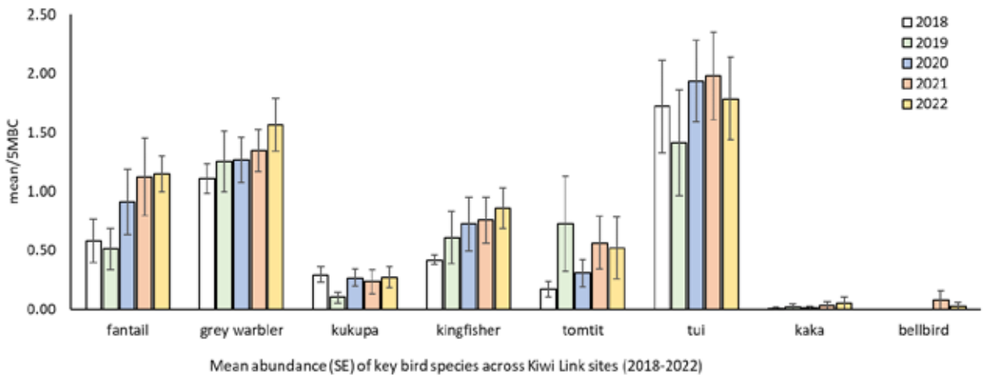
High Value Areas (HVAs) are geographic areas across Northland where high biodiversity and recreational values are matched with strong community interest in pest control. The Northland Regional Council currently supports five HVA totalling a combined area of approximately 130,000 ha. Work to establish a new HVA in western Northland has made excellent progress in 2022-23 and it is expected to start in 2023-24. The severe weather events that occurred throughout the last year has limited the ability for some mahi to be done; however, it is pleasing to note that many conservation gains were made. Highlights from community groups with a weed focus have been described in the previous Pest Plants section. Here we showcase some of the stand-out achievements made in pest animal management over the past year. While some excellent pest management statistics are presented below, it is important to note that pest management should be viewed as a solution to a problem. The problem being that pest animal continue to threaten the existence of our native species. Accordingly, it is splendid to report that monitoring across these projects is showing that at sites with sustained predator control, positive effects on our native species are being observed. For example, targeted five-minute bird counts, pāteke flock count surveys, and kiwi listening surveys all show that populations of these species are stable or increasing in relative abundance.

Kiwi Link

The Kiwi Link HVA is made up of 11 different landcare groups that are actively managing pests across 15,000 ha between Taranui and Ngunguru Ford in the eastern Whangārei ecological district. This project is flanked by significant kiwi populations in the Tutukākā and Whangārei Heads area; accordingly, it has a key focus for this HVA to not only protect its own kiwi populations, but also provide a safe landscape-scale ecological corridor so that kiwi in the other areas can safely move and disperse through Kiwi Link.

During the last year, Kiwi Link groups trapped an impressive 8,086 pest animals, which included 3,672 possums, 3,171 rats, and 102 stoats. This takes the total tally of pests trapped since 2017 to 45,044. This is an underestimate of the total number of pests removed as it is impossible to quantify the number removed through the use of toxins. In addition to the large amount of paid and volunteer pest animal control, a significant amount of pest plant management was also completed as over 1,250 volunteer hours were done by volunteers as well as paid contractor work.

Outcome monitoring across the Kiwi Link area suggests that the hard work being done controlling pests is having a positive impact on native species. For example, targeted five-minute bird counts show that key species are stable or increasing in abundance (see below), pāteke and kiwi surveys have again shown that populations are doing well in the area, and long-tail bat presence was confirmed at several locations. Finally, a flock of four kākāriki, which are rarely seen on the mainland in Northland, were spotted in the Owhiwa area. The achievements of the Kiwi Link HVA will also be resulting in a beneficial 'halo' effect for the adjoining Whangārei Heads and Tutukākā biodiversity strongholds as less pests are re-invading these areas and native wildlife will be spilling into them.



Mean abundance (SE) of key bird species across Kiwi Link sites (2018-2022)

Mid-North

The Mid-North HVA, which has been running for five years, links together 68 community, hapū, school, and agency-led projects over approximately 40,000 ha. A total of 40,661 pest animals were removed from this HVA, including 13,533 possums, 14,587 rats, 510 stoats, 409 weasels and 566 feral cats.

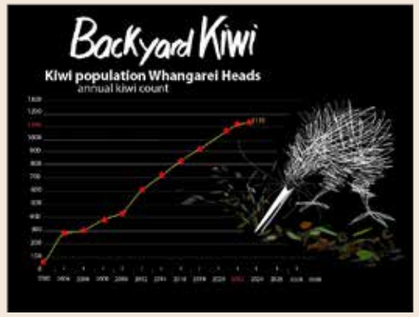
The Pest Free Purerua Peninsula also sits within this HVA and has just finished its third year of operation. This project covers 7,600 ha and approximately 25% of Northland's kiwi population are thought to reside there. The project has significantly boosted the existing pest control since beginning in 2020 and 1,434 pests were removed by traps in 2022-23. Monitoring has confirmed that pests, such as possums, are now at very low abundances.

One of the highlights of 2023 was the release of 20 pāteke at The Landing on the Purerua Peninsula, an area of high biodiversity value and part of the Predator Free Pēwhairangi Whānui programme (see the Predator Free Whangārei section of this chapter for more information on this). This release was supported by Ngatiwai Trust, Ngati Torehina, the Pāteke Recovery Group, Kiwi Coast and the Northland Regional Council. Unfortunately, in the months following the release, monitoring revealed that seven pāteke were found to have been preyed on by feral cats highlighting the problems even small numbers of predators, like feral cats, can have. This has since resulted in an increase in feral cat management, which will result in benefits to remaining pāteke and all other wildlife. Additional pāteke translocations are planned for 2023-24.

Images from the Mid North HVA. Top left: Ngati Torehina Matua Hugh and Ngatiwai Matua Hone at the pateke release in March 2023; top centre: pateke on the Purerua Peninsula; top right: Matua Hugh with a pateke; left: a kiwi moving safely among traps (photo Zane Wright).

CASE STUDY

Backyard Kiwi: Integral to Whangārei Heads HVA success



Twenty-two years of successful kiwi recovery work, through mustelid and feral cat trapping, and advocating for responsible dog control has seen the Whangārei Heads kiwi population increase from approximate 80 kiwi in 2001 to an estimated 1,115 in 2023. These population estimates are calculated from the annual directional kiwi call count surveys that are completed each winter. On average kiwi call counts have risen from 2.9 calls per station per hour in 2002 to 8.8 calls in 2023. This is an annual growth of around 10% compared with the national average of a decline of 2%.

As kiwi numbers continue to grow in the Whangārei Heads area, significant numbers of kiwi that are now moving northwards out of the traditional kiwi area of the Whangārei Heads into the wider Parua Bay area and beyond into the Kiwi Link area. People in those areas are delighted to be hearing kiwi calling after an absence of many decades.

While these results from the hard work done across the Whangārei Heads are pleasing, there are no signs of easing off and continued predator control and good dog management is still crucial for kiwi chick and adult survival.

Tutukākā and Whangārei Heads

The Tutukākā and Whangārei Heads projects are two of Northland's longest running HVA's with a foundation built on twenty years of successful pest control and kiwi recovery work. Despite the limitations caused by many severe weather events in 2022-23, both HVA's have largely maintained the huge amount of work that is done by both paid contractors and volunteers.

The Tutukākā HVA trapped more mustelids (212) in 2022-23 compared to the previous year; although, the actual number is likely to be considerably higher thanks to a highly successful community-led 1080 operation across 250 ha of private land. Very high levels of bait take were recorded in this operation, which will have resulted in the secondary kill of many stoats and enhanced protection of kiwi and other native species.

The hard work that has been done across the Tutukākā HVA for a continues to have positive impacts on native species as indicated by annual kiwi listening surveys which show that call rates have increase 39% compared to pre-2011 data. Furthermore, pāteke flocks are steady or increasing across the project area, as indicated from the annual Department of Conservation and Kiwi Coast led surveys, and bittern and long-tail bats are also present in the area.

Finally, the Tutukākā Landcare Coalition (see below image) were honoured at the 2023 Northland Regional Council Whakamānawa ā Taiao – Environmental Awards for the mahi and took out the Kiwi Coast Outstanding Group or Project category.

Backyard Kiwi Project Manager, Todd Hamilton, showing Humphries the kiwi to students at Whangārei Heads School in June 2023.

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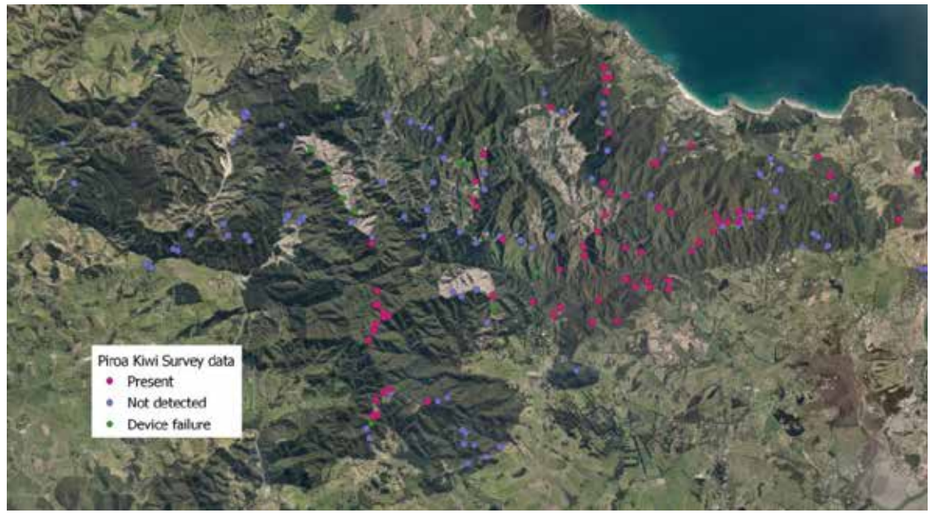
Piroa-Brynderwyn

The Piroa Brynderwyns HVA consists of 35 different landowner and community-led groups that are actively managing both animal and plant pests across 22,374 ha. This area encircles the Brynderwyn Range and extends north to Waipū, east to Te Paepae o Tū (Bream Tail) and south to Mangawhai. These groups removed 3,635 pest animals over 2022-23 bringing the total number over the five years since Northland Regional Council funding began to 16,524.

While recording trap catch provides some information on the numbers of pests removed, it does not give the complete story as the number killed through toxin operations is not able to be measured. As such, the Piroa Conservation Trust uses different toxins in strategic locations to great effect. For example, 1080 was used at Waorahi in 2021 (200 ha) and in 2022 it was placed in three DOC reserves adjoining Waorahi. These operations sit alongside other conservation blocks using other toxins forming a contiguous area of more than 1,500 ha under intensive pest control.

The Piroa Conservation Trust also conducted a large-scale kiwi survey using Automated Listening Devices (ALDs) at 165 locations over the HVA. Excitingly, kiwi were detected at 44% (77) of the ALDs. The results provide a map of kiwi presence/non-detection across the HVA landscape (see below). This information is critical to focus future predator control efforts, such as where to intensify trapping networks, which traps to use, and where vulnerabilities and gaps are across the network. This mahi will also provide an opportunity for kiwi advocacy with landowners and the wider public.

Left: Mustelid traps destined for the Mangawhai Community Park project; right: Piroa Conservation Trust volunteers installing a new trap on the Baldrock / Brown Road trapline; bottom: Aerial photo of the Piroa Brynderwyns HVA project area showing locations where kiwi listening devices were deployed. Pink dots indicate that kiwi were detected there.



Western Northland

Waipoua HVA coming!

A community led Waipoua High Value Area has been confirmed for 2023/24. The governance or decision-making bodies of the seven existing CPCA's in the area have agreed to their involvement in a community-led HVA model. This includes Te Roroa, who are leading the strategic vision and direction for the Waipoua Forest. Decision making about what happens is a partnership between Te Roroa and the Department of Conservation (DOC). The HVA-model would sit underneath this as one way to operationally contribute towards achieving pest control goals in their rohe by supporting the mahi on the iwi and private land surrounding the Waipoua. Over the next financial year, the focus will be on creating a fit for purpose HVA structure that further strengthens the existing relationships and collaboration while continuing the existing pest control across these areas.

DOC Contractor working the possum habitat on private land.

Forest health – possum and rat control

Forest health protection is a key component of pest control work in the Waipoua area. Rat and/or possum control is carried out by Te Toa Whenua, Maunganui Bluff, Native Forest Restoration Trust (NFRT), Pupurangi, Waipoua Forest Trust (WFT) and Wekaweka CPCA's. Furthermore, in October DOC, in partnership with Te Roroa, completed an aerial 1080 operation in the Waipoua Forest. The aerial operational boundaries overlapped or adjoined with the Te Toa Whenua, Native Forest Restoration Trust, Waipoua Forest Trust and Wekaweka CPCA's (refer to map overleaf). This aerial 1080 operation will have provided great benefit for these projects by reducing rat and possum numbers over their own project area and the wider landscape along with secondary poisoning of mustelids, which removes trap shy animals. This will have had the flow on effect of benefiting the kiwi protection efforts by Kaitiaki Kiwi Waipoua. NRC's investment in the infrastructure of baitstation networks and funding of possum control through the Te Toa Whenua, Native Forest Restoration Trust and Waipoua Forest Trust CPCA's will also help to slow the reinvasion of possums on the southern end of the forest. Additional funding was provided to support DOC contractors to do ground control in the privately owned forests that adjoin Waipoua on the northern side in the Waimamaku Valley. This removed over 3000 possums (conservative estimate).

Pupurangi CPCA completed bait fills for rat and possum control from December 2022 – March 2023 across their 150ha bait station network and were able to reduce their rodent tracking from 34% down to 6%.

Three bait station fills for possum control using Feratox and Double-Tap were completed at Maunganui Bluff between September – November 2022. Large numbers of dead possums were seen under bait stations but a Residual Trap Catch (RTC) monitor completed in January 2023 returned an index of 18%, well above the operational goal of 10% or less and indicated that the possum population was still too high to be achieving forest recovery goals. While discussions were had about how to improve the efficiency of the bait station network and method of control, follow up operations with Feratox were completed by Te Roroa and contractor support in March and May. Improvements in timing of the operations, in-filling of gaps in the network with more bait stations and biobags and targeting of areas with leg-hold trapping will be implemented next year.

On NFRT's Michael Taylor reserve, adjacent to Pupurangi, a bait station network was installed for possum control to support the restoration of this property and protect the existing native bush that is contiguous with the Marlborough Forest.

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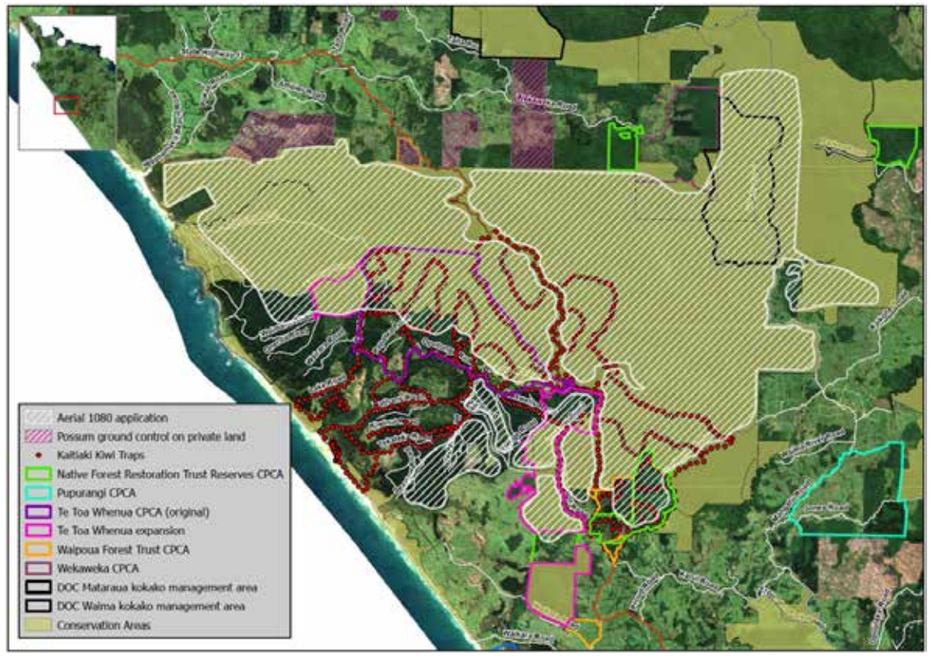

Map showing the overlap of the DOC aerial 1080 operation with existing CPCA's and the NRC funded ground control on the Northern side of the forest with participating landowners.

Forest health – goat and pig control

A collaborative approach to goat and pig control has been occurring with successful results.

DOC and Te Roroa have a pig control programme operating in the Waipoua Forest for kauri protection.

Pupurangi and NFRT have been working with DOC and neighbouring forestry companies to look at managing goats at a landscape scale to make a more meaningful impact in reducing numbers by combining resources to reduce the impacts of goat browsing. DOC, NRC and Manulife funded contractor goat control across Marlborough Forest, CPCA management areas and forestry and over 70 goats were culled.

Maunganui Bluff contains rare and endemic plant species that are threatened by goat browse. NRC Biosecurity, DOC and Te Roroa staff collaborated to focus resources on reducing goats within the Maunganui Bluff to low levels. The agreed plan was to engage a contractor to carry out ground control, working the block to push goats towards the coast and then follow that work closely with an aerial shoot to target the goats residing on the bluffs which are inaccessible to ground hunting. DOC funded the ground control and NRC funded the aerial shoot. A successful aerial operation was carried out during May 2023, with 50 goats and four pigs shot. There have also been at least 20 goats shot during the ground control. The number of goats killed was higher than expected and a coordinated collaborative approach will still be required to target the individuals remaining and reduce the rate of reinvasion from surrounding areas.

Kiwi Protection

Native Forest Restoration Trust installed new mustelid trap lines in two of their CPCA reserves, Cynthia Hewitt and Michael Taylor. Both of these mustelid trapping networks link in with trapping being done by neighbouring landowners that they are collaborating with, increasing the scale of the control in those areas.

Kaitiaki Kiwi Waipoua have continued their trapping efforts which spans over 6000ha of private, iwi and public conservation land. They have been successful at receiving funding from the Lotteries Commission to complete a study on the feasibility of exclusion fence options to increase the kiwi population within the park so they can be translocated to managed areas.

Progress in establishing the trapping network on the Opara peninsula, Hokianga as part of the Opara/ Wharekawa CPCA has run into contractor capacity issues which has stalled progress. NRC staff have met with the group to reset and get things moving forward once more to protect this last remnant of kiwi on the Hokianga Harbour.

Native Forest Restoration Trust staff opening up their mustelid trapline at Cynthia Hewitt reserve.

Project	Area under management	Ferrets	Stoats	Weasels	Feral cats	Rats
Kaitiaki Kiwi CPCA	c. 6000ha	0	73	21	4	1116
Wekaweka CPCA	735 ha	0	19	12	0	278
Pupurangi CPCA	785 ha	0	23	1	0	60
Native Forest Restoration Trust CPCA - Cynthia Hewitt reserve	153 ha	0	7	0	0	22
Native Forest Restoration Trust CPCA – Michael Taylor reserve	128 ha	Traps not opened until August 2023				

Kiwi Monitoring Highlights

Pupurangi CPCA completed a comprehensive kiwi survey combining 350 camera locations and 10 targeted kiwi listening activities in their 150 ha of native forest. They now have a very good understanding of the territories held by kiwi singles and pairs. These results show they now have four pairs and three single birds within this management area.

Two acoustic listening devices were put out in May to detect the presence/absence of kiwi at locations in the southern half of Maunganui Bluff as part of baseline monitoring work for Te Roroa to assess the next steps for animal pest control at the reserve. Kiwi numbers had dwindled away over the years at the Bluff and had been considered locally extinct. It was therefore very exciting for male and female kiwi calls to be detected at both locations and a pair were heard duetting at one of the device locations which is promising.

Tiakina Whangārei

Tiakina Whangārei is a community-led urban initiative helping people connect with their environment through conservation activities, while supporting existing mahi, to protect and enhance Whangārei's native biodiversity.

This project has evolved into two focus areas. Firstly, to create awareness of conservation issues with Whangārei and to empowered communities to 'take action' over various scales, from maintaining backyard traps through to establishing 'predator free' community groups where management is also conducted in fragments and reserves within Whangārei. This year, Pest Free Kamo was established and over 70 traps have already been distributed across that suburb in backyards and fragments.

Predator Free Onerahi, with support from Tiakina Whangārei, continues to grow with more than 300 pest control devices now uploaded to TrapNZ in that area. In addition to backyard trapping, Predator Free Onerahi maintained bait station lines along sections of Beach Road and the Waimahanga Track. Tiakina Whangārei also supports weed management/restoration groups in that area.

The second area of work involves increasing the amount of pest control that is conducted in forests adjacent to Whangārei. As such, we have provided resources to Pukenui Forest Trust so over 70 ha of bait station infrastructure can be installed across Coronation Reserve. In addition, approximately 90 ha of bait station infrastructure was also installed across Parihaka, which was done in partnership with the Whangārei District Council. This increases the amount of that area under management to 200 ha.

To highlight some of the amazing biodiversity in Whangārei, and promote the public's engagement with their local environment, a 'BioBlitz' was held in November in Parihaka Scenic Reserve. A BioBlitz is an intensive, short term biological survey to detect as many species as possible in an area. Fifteen hapū, educational, government, and non-government agencies took part in the event by providing specialist scientific or cultural support. Over 110 students from 12 ECE/schools joined the survey and a public day was also held. Data collected will help inform future pest management within Parihaka.

Social media outreach	
Page visits	3,265
Post reach	83,987
New page "likes"	400
Total page "likes"	1,566

Tiakina Whangārei engagement	
Public events	6
Facebook posts per month	4+
Print articles	6
Online articles/ newsletters	10
Educational institutes engaged	17

Tiakina Whangārei Trap NZ data	
Pest devices distributed this FY	902
TrapNZ registrations	482
Devices uploaded to TrapNZ this FY	450
Pests removed this FY	554

Above: Whangārei community engaged in urban conservation work.

Performance Measure	Result	Details
Community engagement – events and activities Total number of engagement events and other social media interactions is maintained or is greater than the previous year.	**Achieved**	

	2020-21	2021-22	2022-23
Field Days / A&P Shows	2	0	5
Community events	4	18	7
School visits and workshops	8	0	20
Enviroschools workshops	7	4	9
Pest workshops and contractor training	28	7	10
Kiwi releases and activities	10	0	2
Controlled substances licence courses	5	4	4
Total	**64**	**33**	**57**

Predator Free Whangārei

Ka rere te kūkupa e kawe ana ngā kākano mō āpōpō

Tihewa mauri ora ki te wheiao ki te ao mārama

Predator Free Whangārei

Tiaki te whenua, tiaki te tangata

Key Performance Measure	Outcome
Possum elimination Percentage of project area active in removal phase *'Knock down' or 'Mop Up'*	**16% (1,387ha)** Reotahi Adjoining Farmland and Bush
Possum elimination surveillance Percentage of project area in surveillance phase *'Detection and Response'*	**17% (1,500ha)** Te Whara Taurikura Adjoining Farmland and Bush

Operational Overview

Phase 1: *Knock down* - intensified 1/ha device network to remove possums.

Phase 2: *Mop Up* - reduced network density to capture surviving possums.

Phase 3: *Detect and Respond* - lean detection network using the best tools to efficiently respond to possum sightings.

Predator Free Whangārei is delivering a large landscape scale possum elimination project happening, which covers 9,100 hectares of the Whangārei Heads peninsula. Whilst this project is NRC led, it works alongside the many existing (and new) conservation community groups, mana whenua, schools, around 1,000 landowners, and governmental agencies. Five out of the six full-time staff dedicated to this project are Whangārei Heads locals.

The possum elimination project is now in its second year of on-the-ground delivery. Since commencing elimination work in April 2022, Te Whara, Taurikura Ridge and surrounding Whangārei Heads farmland has moved from an initial 'knock down' phase, to 'mopping up' the remnant possums, to now being focused on detecting and responding when possums are sighted, across the 1,500 hectares.

Work has also begun further inland in the project's buffer zone. Pre-monitoring has been carried out in the 3,100 hectare buffer area that will form the virtual barrier (made up of traps and bait stations). Spanning from the Parua Bay village to Pataua North, the results indicated a pleasingly low number of possums in most of the blocks, which has been a testament to the existing pest control efforts by community. Discussions are underway to further boost and work with community in this buffer zone, which also overlaps with Kiwilink areas.

Over 400 landowners have directly supported the project so far by allowing elimination work to be carried out on their land and by getting in behind the wider kaupapa. Positive results at Reotahi recently have been well received by locals which complements the many hours of volunteering by locals over numerous years.

There has been continued partnering with local uri who are developing their own elimination programme with support from Predator Free field team members. Delivery of this programme will be by uri, and opportunity exists for this programme to expand across a wider landscape as well as ongoing skill development. Engagement with Whangārei hapū members has progressed well, and opportunities are being discussed that could see a taiao focus being the catalyst for closer kaunihera, hapori and hapū partnerships.

Graph showing possum presence over the months as detected by the trail camera network

Left: Possum presence in April 2022. Right: Possum presence in June 2023.

Predator Free team members have supported numerous community events throughout the year and have continued to grow the relationship with Parua Bay and Whangārei Heads Schools to involve their senior classes. Kiwi Coast and Kiwi Link connections have been expanded to include options for their involvement in the buffer area and further mustelid suppression.

Support has been gained by a Dog Advisory Group for a certified possum indicator dog & handler to assist with the "detect and response" work and feed into the Proof of Absence model.

Trialling the latest technology is an important component of the Predator Free 2050 kaupapa. New VHF trail cameras that have the capacity to send image data to one camera has been trialled by the project. This is exciting technology that will dramatically reduce labour costs.

A Facebook page was launched in February and a Report a Possum functionality was published in June. These two platforms have helped encourage further engagement with community and the wider public. It has helped create opportunities to present the kaupapa to new groups, offer more citizen science opportunities, and help people get better set up with trapping in their own backyards.

The programme is at an exciting time with expansion into new areas with an ongoing focus of supporting closer connections with hapū and community groups.

Facebook engagement (launched Feb 2023)	
Page "Likes"	344
Page "Follows"	458
Facebook Posts	82
Post reach	29,383
Post reactions	3,013

Predator Free Whangārei Comms & Engagement	
Public enquiries (Jan – Aug 2023)	44
Public events hosted or presented at	27
Newsletter Articles	33
School engagements	15
Hapu hui	11

Landowner Agreements – Yes	Landowner Agreement – no	Bait stations set live	Traps set live	Trail cameras set active
396	12	329	384	157

Bait Taken last 12 mnths	Annual Bait Station Checks	Trap Catches last 12 mnths	Annual Trap Checks	Possums Detected last 3 mnths 2023	Possums Detected last 3 mnths 2022	% of Area Detected Possums last 30 days
416 kg	4,500	170	4,637	87	160	3.9%

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Top left: Installing AT220s on the coastal strip with community groups
Top middle: Teaching senior students at Whangārei Heads about AT220
Top right: Helping out key community group Bream Head Conservation Trust restore their tracks after Cyclone Gabrielle
Bottom left: Uninstalling Flipping Timmys in areas no longer active in 'Knock down' phase
Middle: Community event in March at McLeod Bay Hall

Predator Free Pēwhairangi Whānui

Hei whakahoki i te mauri ki te ngahere o te rohe

o Pēwhairangi Whānui

Key Performance Measure	Outcome		
Possum eradication Percentage of project area in knockdown / removal phase	Russell Purerua-Mataroa Rakaumangamanga	27% 58% 0%	808 ha 4,595 ha
Possum eradication surveillance Percentage of project area in surveillance phase (Detection and response)	Russell Purerua-Mataroa Rakaumangamanga	0% 0% 0%	

Predator Free Pēwhairangi Whānui Engagement	
Collective Hui	6
Peninsular Hui	11
Hapu hui	8

The Predator Free programme spans the Purerua-Mataroa, Rakaumangamanga, and Russell peninsular. An ArcGIS mapping and data platform is being rolled out across the three peninsular to record real-time data and to track results.

Filming started for the Pēwhairangi Predator Free promotional video and featured Predator Free 2050 Ltd CEO and Pēwhairangi Whānui Project Lead in cameo performances, supported by Te Rawhiti 3B2 Ahu Whēnua Trust.

Predator Free Russell (Russell Landcare Trust)

A highlight has been the overwhelming community buy-in shown by almost complete saturation of landowner access provided across the project area, and rat catch numbers trending toward zero during the current knock-down phase. Another highlight is that no possums have been caught or detected over the last quarter.

Servicing almost 6,000 devices in the Old Russell Peninsula area and over 1,200 devices in the Orongo Bay area, on 10-day cycles, they are now at the end of the knock-down phase and will be moving into the final mop-up phase soon.

Thermal AI cameras will be trialed as part of the project's detection network. It is hoped the data will provide greater accuracy than current trail cameras.

Predator Free Russell's trappers

Kiwi Coast's project Pest Free Purerua-Mataroa at their Pāteke release

Predator Free Purerua - Mataroa (Kiwi Coast, Ngati Torehina)

Kiwi Coast's project Pest Free Purerua-Mataroa has already been carrying out successful pest control for years and Pēwhairangi Whānui will help boost the existing efforts to make the peninsula pest-free.

Kaumatua and kuia representing Ngāti Torēhina have provided tīkanga and guidance for the delivery of the project in the eastern zones over the last twelve months.

The eastern zones Elimination Plan is completed, and Kiwi Coast have commenced installation of additional traps and bait stations across the peninsular.

Ngāti Rehia - Predator Free, Te Ahutai (Ngati Rehia)

"Ko te Ahurei Taiao, He tupu hāpai, Kia tau te wā"

Ngāti Rēhia kaumatua and management staff lead an uplifting and meaningful wananga to name the project and capture the essence of the kaupapa. Te Ahutai derives from Ahu which embodies uniqueness and uplifting creativity and connection with nature, and Taiao which heroes the subject at hand, and the importance of restoring the health of the Whēnua, ngāhere, and people.

An experienced trapper (Ngāti Rēhia whakapapa) has been employed to deliver the western zone enhanced suppression mahi and will work alongside recently appointed Predator Free Taiao Lead on community engagement. Community and hapū engagement at Te Tii has been completed and planning underway for Takou whanau.

Ngāti Rēhia's Te Ahutai project presenting at Hapū hui in Takou

Predator Free Rakaumangamanga (Ngati Kuta, Patukeha, Te Rawhiti 3B2 Ahu Whenua Trust)

Design and delivery of the elimination programme is being led by Te Rawhiti 3B2 Ahu Whēnua Trust. Delivery plans and budgets have been completed and support in principle provided by Ngāti Kuta and Patukeha hapū. Progress to implementation has been delayed with the outbreak of the marine pest Caulerpa which has involved many of the hapū team who are also leading the predator free mahi. Commencement of the elimination delivery is expected by late August.

Predator Free Pēwhairangi Whānui builds on the existing pest control efforts by community and hapū

Filming for Predator Free Rakaumangamanga, at their wetapunga release on Urupukapuka Islandwith Project Island Song.

7. Kauri Protection

268
New sites sampled since 2018

40
Kaitiaki engaged through iwi/hapu collaborations

3
Kauri Protection workshops
23 since 2020

247
Hectares of kauri forest protected by new fencing

1625
Meters of walking track upgrade | Since KDTM Project completion

255
Hygiene kits distributed
1355 since 2018

12
School visits/events
65 since 2018

12
Hygiene stations installed

57 since 2019

460
Students educated about kauri dieback

2,500 since 2019

Programme objectives and aims

Sustained controlled diseases are those that are widespread throughout Northland. This section relates to the management of Phytophthora agathidicida (kauri dieback) disease in Northland. P. agathidicida is managed by a multi-agency collaborative partnership between tāngata whenua, Biosecurity New Zealand, Department of Conservation, Auckland Council and the Northland, Waikato, and Bay of Plenty regional councils.

Objectives

- For the duration of the Pest Plan, prevent the spread of P. agathidicida to reduce impacts on biodiversity, cultural and economic values in Northland.
- Ensure coordination with other government agencies and the Department of Conservation to achieve the Pest and Operational Plan objectives.

Aims

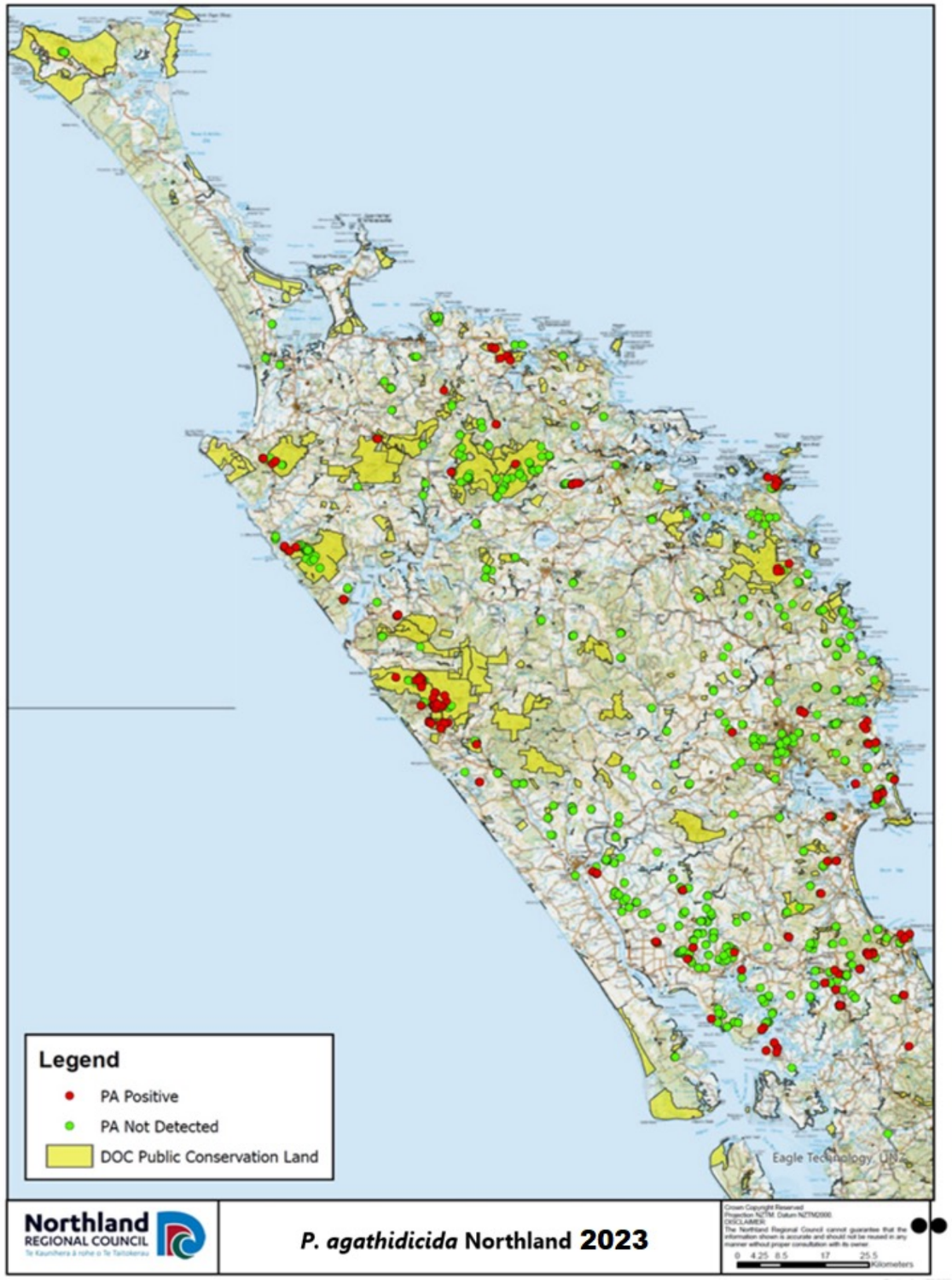
- To maintain a complete record of the distribution and severity of P. agathidicida in Northland.
- To increase public knowledge and skills and encourage people to take action to help reduce the spread of P. agathidicida.

To ensure that measures taken under the Pest Plan are complementary to inter-regional and national approaches to kauri protection.

<table>
<tr><th>Performance Measure</th><th>Result</th><th>Details</th></tr>
<tr><td>Soil sampling
100% of remaining aerial survey sites on private land will be sampled and a minimum of 50% will have management plans. There are 309 sites in total.</td><td>Not achieved</td><td>
<table>
<tr><th>Sample site</th><th>Since 2018</th></tr>
<tr><td>Aerial surveillance sites sampled</td><td>268</td></tr>
</table>
Overleaf is a map of Northland sample site locations.
Positive sites identified 2022-2023 = 2</td></tr>
<tr><td colspan="3">The remaining 43 sites identified in the 2017-2018 aerial survey are landowners who have either denied access, or who were unable to be contacted during the year despite repeated attempts. Future compliance actions in respect of these sites will be directed by the new national plan.</td></tr>
<tr><td>Management plans</td><td>Not Achieved</td><td>
<table>
<tr><th></th><th>2019-20</th><th>2020-21</th><th>2021-22</th><th>2022-23</th><th>Total</th></tr>
<tr><td>High risk properties</td><td>15</td><td>3</td><td>2</td><td>N/A</td><td>20</td></tr>
<tr><td>Plans prepared</td><td>33</td><td>8</td><td>2</td><td>N/A</td><td>43</td></tr>
</table>
</td></tr>
<tr><td colspan="3">Plan preparation for high-risk properties has been prioritised and is proceeding as quickly as is possible within constraints of staff availability. Further work is required to engage with the multiple landowners to develop plans.</td></tr>
</table>

Mitigation advice

Landowners with sites that have tested negative or deemed to be low risk for P. agathidicida are supplied with a mitigation advice plan. This landowner support is undertaken outside of the Pest Plan and is considered a valuable additional measure to help prevent the spread of P. agathidicida. Since 2018, 163 mitigation advices have been issued.



Performance Measure	Result	Details
Incident response times All incidents are recorded, and a response plan developed and implemented within 20 working days	**Achieved in part**	2019-20: Incidents reported 16; 2020-21: 15; 2022-23: 18 All incidents were responded to, and a plan formulated within 20 days, but plans could not always be implemented due to covid and other factors.
This performance indicator is difficult for the team to achieve because: • P. agathadicida sampling cannot be performed in wet conditions and testing takes two months to complete. • A full response is not always practical or necessary within 20 days.		
P. agathadicida distribution Maintain a record of distribution of P. agathidicida disease across Northland.	**Achieved**	Data has been recorded on both national and council databases. Sampling data is recorded in ARCGIS online and viewed through a Kauri Dieback Viewer.
Hygiene stations 14 hygiene stations installed to improve track hygiene in 2022-2023. Locations included the Waitangi treaty grounds and A H Reed reserve in Whangārei.	**Achieved**	2019-20: Stations installed 7; 2020-21: 10; 2021-22: 11; 2022-23: 14

Hygiene stations are an important part of helping ensure visitors to our kauri arrive (and leave) with clean footwear. This year the Biosecurity kauri protection team provided 14 hygiene stations across Northland. The barrel and grate stations come in two sizes for tracks with varying volumes of traffic. Additionally, with the support of external funding the team was able to purchase 3x MKII automated stations and replaced the old one at A H Reed Reserve in Whangārei.

Hygiene stations 2022-2023	
New barrel and grate hygiene stations provided	14
Replacement guns for existing stations	8
Sterigene concentrate provided	103 L
Construction jobs Whangārei Men's Shed	16
Construction jobs Waipū Menzshed	18
Mountain bike cleaning station	1
Upgrades to existing stations	11
New MKIII automated stations	3

Above: New MKIII hygiene station at AH Reed

Kauri Museum 60th Anniversary

The Kauri Museum of Matakohe celebrated its 60th Anniversary in 2022. The museum held a free open day on Saturday the 15th October 2022. The event provided the opportunity to not only set up a stall for Kauri Protection but to do it as a collaborative effort across agencies.

This was the first-time staff from kauri lands agencies were able to come together to attend the same event for Kauri Protection. Staff from NRC and Auckland Council joined forces to make the day a huge success.

It was not only an extremely well attended event. There were many interested people with many great questions and lots of enthusiasm. It was a great day all round!

There was a great turn out on the day for the 60th anniversary of the Kauri Museum

Biosecurity staff did a terrific job interacting with visitors and answering all the important questions

Staff drawing in the crowd

Performance Measure	Result	Details			
Community engagement – events and collateral Deliver a minimum of 10 public engagement events annually.	**Achieved**	*Refer Appendix for more details*	**2020-21**	**2021-22**	**2022-23**
		Field Days / A&P Shows	0	0[1]	2
		Community events (includes sponsorships)	3	0	3
		School visits	24	6	6
		Stakeholder activities	9	12	N/A
		Kauri protection workshops	8	11	3
		Pig hunting competitions	2	4	2
		Total events	**46**	**33**	
		Collateral distributed – hygiene kits	200	200	255
		Collateral distributed – Visitor's flyer	-	0	-
		Collateral distributed – All flyers	-	500	400
		Collateral distributed – Waitangi flyer	-	50,000	0
		Collateral distributed – Tiakina kauri bags etc	-	-	120

Kauri Protection Flyers

These flyers are full of key information on how to protect kauri and are created for specific forest user groups. We have expanded the list to include Mountain bike riders and horse riders.

Hygiene Kits

An essential tool to help protect kauri, approximately 255 hygiene kits were distributed to the community in 2022-2023.

Team in Action

Kauri Protection at NRC has expanded to a team of 4 at the start of 2023.

Kauri Protection Specialist Chris Beard picking up a load grates for hygiene stations built by the Whangarei Mens Shed.

[1] *Events were cancelled by Covid-19.*

Pawarenga Vehicle Hygiene Station

On a wet May day this year staff joined local Te Rarawa iwi/hapu on site for the delivery of a concrete tank to store water for the ongoing use of the vehicle hygiene station. It was decided that the concrete tank was needed to sure up the water supply for the station and not interrupt local supplies. The delivery and install of the tank and parts went off without a hitch with locals on hand to help position the tank correctly.

The tank is swung into place in its new position above the yellow grated platform of the vehicle hygiene station.

The tank install crew with Pawarenga church in the background.

Performance Measure	Result	Details
Fencing External funding was sourced and spent on protecting Kauri from P. agathidicida by fencing off forest blocks on private land	**Achieved**	

	2021-22	2022-23
Number of properties fenced	3	8
Distance of fencing installed (m)	2850	3410
Size of forest protected (ha)	30	247

Various challenges were faced in organising these jobs including COVID and a lack of available contractors.

Kauri protection monthly updates

The Kauri Protection Team's monthly update continues to be delivered to a variety of partners and stakeholders across all of kauri lands. The update provides recipients the opportunity to learn about all the work that is carried out in the kauri protection space at NRC.

There are now 75 recipients of the monthly update from iwi/hapu, community groups, other councils, DOC and scientists and researchers. With the new team in place this concept will be continued and expanded on its current format into next financial year and beyond.

8. Freshwater Pests
Riha wai māori

Exclusion freshwater pests

Key points of the exclusion freshwater pest programme

- Enforcement of rules relating to exclusion freshwater pests.
- Eradication of exclusion freshwater pests found in Northland.
- Inspection and enforcement of rules relating to plant nurseries and retail outlets (National pest plant accord). This performance measure is reported in Section 6.4 Sustained control plants.

Progress in achieving aims

Performance Measure	Result	Details
Identify new sites Identify new sites of freshwater exclusion pests through passive and active surveillance by council staff, the public, or through regional surveillance	**Not applicable**	<table><tr><th></th><th>2020-21</th><th>2021-22</th><th>2022-23</th></tr><tr><td>**Confirmed incursions**</td><td>0</td><td>0</td><td>0</td></tr></table>
The Exclusion incident investigation Initial investigations for all reported sightings and/or discoveries of exclusion species undertaken within 5 working days.	**Not applicable**	No reports of exclusion species
Exclusion Incident response A response plan developed and implemented for any new incursion of an exclusion species within 20 working days of confirmation of species	**Not applicable**	No reports of exclusion species

Orfe
Follow up work was undertaken at Martins Dam (Paparoa) that was previously identified as a potential historic orfe release site. In March 2023, a concerted netting effort was carried out in partnership with DOC with several fish collected for DNA analysis. Morphologically the species appeared to be koi which are known to be present. The same operation was used to trial NRCs floating fish feeder and camera surveillance system which proved to be effective at detecting and identifying koi carp on camera. The results of genetic tests to determine if they are orfe are yet to be provided by DOC and will be reported on in the new year 2023-2024. This site remains active at present.

Eradication freshwater pests

Key points of the eradication freshwater pest programme

- Enforcement of rules relating to eradication freshwater pests.
- Eradication of listed eradication freshwater species found in Northland.
- Inspection and enforcement of rules relating to plant nurseries and retail outlets (National Pest Plant Accord). This performance measure is reported in Section 6.4 Sustained control plants.

Progress in achieving aims

Performance Measure	Result	Details
Identify new sites Identify new sites of freshwater eradication pests through passive and active surveillance by council staff, the public, or through regional surveillance.	**Achieved**	New sites identified: **Red-eared slider turtle** 2020-21: 9(9); 2021-22: 12 (12); 2022-23: 2(2) **Salvinia** 2021-22: 2; 2022-23: 3 **Water hyacinth** 2022-23: 4 **Eastern water dragon** 2021-22: 1; 2022-23: 1(1) **Snake-necked turtle** 2022-23: - Unbracketed figures are the total confirmed new sites identified in the year. Bracketed figures are the subset of the new sites arising from public reports.

Red-eared slider turtle (2022-2023)
Red eared slider turtle reports from the public were much lower than in previous years across Northland. This was likely due to the frequent flooding events during summer when slider turtles are more active. Downstream dispersal of turtles is also expected following flooding events (and subsequent habitat loss) which means that previously known turtle locations may no longer be accurate.

This year's work program instead focused on raising awareness of aquatic pests at events such as the Dargaville Field Days and on improving the tools in the toolbox. Our events theme was "Don't let pets become pests" with Snappy the Red-Eared Slider turtle the undeniable star of the show. The new turtle display and signage provided a visual demonstration on how aquatic pest animals and plants can impact water quality, while providing simple solutions on how the community can prevent the spread – such as Clean Check Dry. Over the course of the weekend the team received lots of new requests for assistance with pest fish including a landowner in Kerikeri who reported having a pond filled with at least 20 slider turtles. This report highlights the existence of a significant slider turtle population within Northland.

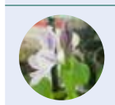
Red Eared sliders are an increasing issue for several regions and the Top of the North councils (NRC, Auckland Council, Waikato, BOP and Taranaki), DOC and Biosecurity New Zealand have established a red eared slider turtle regional working group. The group will focus on communications and engagement, technical support and best practice trapping approaches and managing rehoming or euthanasia of turtles. Several new basking traps have been made to improve catch efficiency of turtles in the 2023-24 year as well as the development of a turtle sniffer dog which will be used to sniff out nesting sites or hibernating turtles at the lake during winter.

Performance Measure	Result	Details
		Eastern water dragon Throughout the 2022-2023 period, there were only two eastern water dragon (EWD) sightings reported both from the Lamb Road area. The second report resulted in a specimen being collected as roadkill and it is assumed that this was the same individual sighted earlier, given the description and close proximity and timings between sightings. The EWD was a reasonably large sized specimen in good condition and is currently being held in freezer storage at NRC. The specimen will be sent for taxidermy and used as a prop for advocacy and education at public events (Feld Days, school, or public events). No additional reports of EWD have been reported for the year ending. **Salvinia** Two salvinia sites (a National Interest Pest Response species) were found by Biosecurity officers and reported to MPI for control and monitoring. A Biosecurity Officer also identified salvinia being offered for sale on Facebook. The seller was contacted and the post was taken down immediately and the details were passed on to the Ministry Primary Industries (MPI) for control and trace back activities **Water hyacinth** A new site of water hyacinth site, also a National Interest Pest Response species, was identified in a small pond during routine inspection work for other weed species. In discussions with the property owner the officer identified a second larger source site. Two other water hyacinth sites were also found by Biosecurity Officers during the course of their work. An officer also followed up a report from the public of a fourth potential water hyacinth site , but this was found to be Mexican water lily. Details of all confirmed sites were provided to the Ministry for Primary Industries for control and ongoing monitoring.

Performance Measure	Result	Details
Incident investigation and response Initial investigations for all reported sightings and/or discoveries of eradication species undertaken within 10 working days and control actions completed within 20 days.	**Achieved in part**	**Incidents reported** 2020-21: 11; 2021-22: 19; 2022-23: 4 Of the two reports of red eared sliders, one was reported after it was rehomed by the Kerikeri SPCA. The second was the landholder in Kerikeri (see above for details) which will be subject to a larger response plan. For the eastern water dragon reports see above for details
The one public report of water hyacinth was followed up within 10 days and found to be Mexican water lily. Staff capacity for freshwater animal work continue to limit resolving new reports of eradication species alongside managing other freshwater pest species across operational sites. The large population of red-eared slider turtles identified in Kerikeri will require more resourcing and effort to determine strategies around trapping and management control. These processes will be developed over the 2023-2024 year with the support of external experts through the red eared slider turtle working group.		

Performance Measure	Result	Details
Best practice management 100% of NRC freshwater pest plants management sites visited on scheduled best practice rotation (based on biological characteristics of each species and defined in the species programme record in the Council's IRIS database).	**Achieved in part**	Refer species specific details below.

Eradication freshwater pest management site visits 2022-2023

Eradication species		Results	Details
	Eastern water dragon	Not applicable	No active management sites.
	Eel grass	Not applicable	No active management sites.
	Nardoo	Achieved	One monitoring status site confirmed to still be free of nardoo and site declared eradicated.
	Red-eared slider turtle	Not achieved	There are 17 sites where turtles are considered to be present based on sightings and reports. Four sites still remain classified as 'undetermined' because of the unverified nature of the reports, or the detail provided. No trapping or surveillance work was undertaken at any of the sites due to limited capacity and weather conditions.
	Salvinia	Not applicable	Sites are managed by the Ministry for Primary Industries.
	Senegal tea	Achieved	Annual inspection undertaken for the one active site.
	Snake-necked turtle	Not applicable	No active management sites.
	Water hyacinth	Not applicable	Sites are managed by the Ministry for Primary Industries.

Annual Report on the Biosecurity Operational Plan | 2022 - 2023

Eradication freshwater pest management site summary

Eradication freshwater pest		Adult count 2020-21	Adult count 2021-22	Adult count 2022-23	Details
	Eastern water dragon	0	1	2	No active or monitoring status management sites. See above for further details
	Eel grass	0	0	0	No active or monitoring status management sites.
	Nardoo	0	0	0	The one monitored site has now been declared eradicated.
	Red-eared slider turtle	5	16	17	17 existing active management sites where a turtle is believed to be resident in the wild but could not be captured, and 4 undetermined sites. The count is currently based on one adult turtle per site classified as 'present', but the new site in Kerikeri potentially has more than 30 turtles present.
	Senegal tea	2	2	0	One active management site. One small dense area of immature growth found and treated.
	Snake-necked turtle	0	0	0	No active or monitoring status management sites.

Performance Measure	Result	Details
Red-eared slider distribution Maintain database and map tool for management of turtle sightings	**Achieved**	We now have our mapping tool linked to the new database structure which allows us to visualise the distribution of Red- Eared sliders across the region. It divides management sites into the categories below: **Eradicated:** Sites where control effort has successfully eradicated a known population or individual, or the original site locations of instances where turtles have been caught and handed in by the public. This ensures we have a complete record of previous infestation sites and a record of the frequency of pet escapes/ turtles being found with uncertain origin. **Present:** Sites where turtles have been confirmed as present by staff surveillance or by good quality public reports/photo evidence. These should ideally be the target of control operations, where capacity allows. **Undetermined:** Reported sites where it is not clear if a turtle is still present/active at a reported site of because of the nature of the original report (it may be unverified, or second-hand, or lacking in detail). Further surveillance work or reports from the public are required to confirm presence/absence at these sites. **Not detectable:** Where intensive surveillance work has been carried out and has not resulted in any evidence of a turtle being present (i.e. the initial report not reliable or was a different species i.e.. not a red-eared slider).

Red eared slider poster is collateral developed for Dargaville field days event in conjunction with a live turtle display to promote awareness around red eared slider turtles.

Progressive containment freshwater pests

Key points of the programme

- Enforcement of rules relating to progressive control freshwater pests.
- Eradication or reduction of infestations of progressive containment freshwater pest may be attempted with council in conjunction with Crown agencies and stakeholders where practical.

Progress in achieving aims

Performance Measure	Result	Details
Incident investigation and response Initial investigations for all reported sightings and/or discoveries of Progressive Containment species undertaken within 10 working days and decisions documented within 20 working days.	**Achieved in part**	<table><tr><th></th><th>2020-21</th><th>2021-22</th><th>2022-23</th></tr><tr><td>**Public reports**</td><td>6</td><td>2</td><td>2</td></tr></table> 2 reports of freshwater progressive containment species were responded to in 2022-2023. For both reports, initial response time targets were met. Actual netting and surveillance operations took a little longer to initiate because of the resources required and weather conditions or flooding holding up fieldwork.

Incident investigation details

There were two reports of freshwater progressive containment species.

A report of a dead fish resembling perch (March 2023) in a roadside drain with connections to the Kaihu River 20km north of Dargaville was responded to within three days of receiving the request. The fish in question was not located, instead, a reconnaissance of the drain was completed and assessment of the connection to the larger Kaihu River carried out to assist with planning a surveillance operation in 2023-2024.

The second report related to a die off event of possible koi carp in a small drain connected to the Awakino river (Dargaville) which is outside the current containment zone. Flooding had flushed the drain of any remaining fish and a surveillance netting operation was carried out in May 2023 with no koi captured. A more concerted netting operation and eDNA sampling will be carried out in 2023-2024 to confirm koi presence/ absence in the river system.

Maintain distribution record. Maintain an updated distribution record of progressive containment pest fish species.	**Achieved**	The pest fish database for all three Progressive Containment species has been updated to reflect the status and management actions undertaken this year for existing sites and new sites. It divides management sites into the categories below. **Present:** Sites where the species has been confirmed as being present to a high degree of certainty. **Undetermined:** Sites created in response to incursion reports that still require surveillance effort to confirm presence (or absence/not detectable at that site). **Not Detectable:** Sites where intensive surveillance has been undertaken in response to reports, but the pest species has not been detected and we have a high level of certainty that they are not present at that site. **Eradicated:** Sites where koi have been confirmed and have been subsequently eradicated (having met post-eradication monitoring surveillance effort minimums).
Management and eradication actions Training, surveillance, control, and eradication actions attempted for progressive containment pest fish species will be reported annually.	**Achieved in part**	Refer to species specific status and management summaries below.

The intensity and scale of management actions required to produce definitive evidence to confirm either the presence/absence of reported pest fish (such as netting), in conjunction with the seasonal limitations (water temperature impacts fish activity) means being able to deliver an efficient and effective pest fish program is extremely challenging and resources intensive.

Capacity is still limited to one dedicated pest fish specialist role, who in the past had to rely on other teams to help resource this work. The availability of an additional FTE on short term contract has significantly increased the ability to undertake surveillance and response activities meaning two previous long standing koi sites to be re-evaluated as undetected and no further monitoring will be required. There has also been a shift in focus to a partnership-based delivery model with the specialist working closely with the Department of Conservation and Fish and Game, and their key freshwater field officers, to prioritise and deliver netting operations.

Additionally, we are developing smart tools like our new camera surveillance systems to detect pestfish in high value biodiversity and culturally significant dune lakes (i.e., Kai iwi). This tool is currently being trialled in partnership with mana whenua of these lakes (Te Roroa).

Management and eradication actions in 2022-2023

Annual reporting on the status and number of new sites regarding Progressive Containment freshwater pests, associated training opportunities, pestfish surveillance, control, and eradication actions attempted during 2022 2023 are outlined below.

Koi carp

Koi carp caught at Waipu Golf Course by grounds keeper Garry Shanaghan with NRC during cyclone Gabriel 2023

Outside the containment area

The summer season prioritised surveillance netting and eDNA sampling where applicable at the 'Undetermined' status management sites. The driver of this surveillance work is to provide robust evidence to either confirm presence at the sites, or to reach a high certainty that the reported species is not present, and no future work is required. Sites were prioritised based on risk and biodiversity value. This work was made possible through an ongoing partnership with Department of Conservation and fieldwork assistance from the Check Clean Dry advocate. Two sites (Awanui River and Kaka Street Drain) have recently been re-evaluated based on recent surveillance results and their status is to be changed from undetermined to not detected as discussed below.

Confirmed sites outside the containment area (2 sites)

Location	Type of site	Date confirmed	Activity undertaken 2022-2023
Ōmāmari	**Dune lake/ wetland**	**2012**	Despite being a high priority site, no surveillance work was undertaken this year due to access restrictions by the landowner which have been in place since 2012. However, recent discussions with the landowner (July 2023) resulted in him providing access to the lake without the need to use Warranted Officer powers under the RPMP (via the Biosecurity Act 1993). The status of pestfish in Lake Omamari will be determined in the new year and reported on in the 2023-2024 operational report.
Kaingaroa – Mangatete River	**River system**	**September 2020**	The undetermined status of koi carp in the Mangatete River since the capture of one fish in 2020 remains in place with no further koi carp captured in past 2021-2022 and 2022-2023 seasons. This work has been carried out in partnership with DOC using either gill or fyke nets set within the Mangatete River, and no detection using eDNA sampling. This season we attempted to use another sampling approach (electrofishing) which would increase our capacity to detect pestfish. Unfortunatley, technical problems with the equipment on site couldn't be resolved and the system could not be used to good effect. The electrofishing system will be trialled again in 2023-2024 along with our new underwater camera surveillance tools.

Potential sites outside the containment area to be confirmed (10 sites)

Location	Type of site	Activity undertaken 2022-2023
Kaitaia, Awanui and Karemuhako River	Stream	This river has multiple reports of koi and is classed as a high priority site. eDNA and netting results (May 2021) show goldfish are present. Extensive netting operations were conducted on private properties along the breadth of this river system in lower reaches of the Awanui River, mid reaches off Dodds Road and close to its headwaters in the Karemuhako River to determine presence/absence of koi. Across all sites only naturalised goldfish were caught which is consistent with eDNA evidence collected from these sites. Several orange-coloured specimens from the Karemuhako and Awanui sites which could be confused for koi carp, were identified as goldfish. Another small netting operation was conducted in collaboration with DOC on the 10th and 11th of July 2023 in the Awanui river outside Knight Engineering and Marine workshop which also proved to be naturalised goldfish. Based on corroborating eDNA analyses and extensive netting operations delivered over the past 3 seasons across the breadth of the Awanui and Karemuhako river systems, there is no clear evidence of koi carp in the river and their status will be moved to "undetected". Public reports of orange fish are likely to continue for this river which will likely be mis-identified koi carp. We would need to ensure any future reports have some conclusive evidence, photos or the reports are from an experienced fish person to commit time and resourcing too. No further monitoring would be required for this site.
Kai iwi Lakes, Taharoa and Kai Iwi Lakes	Lake	Following the sighting in 2021 of koi in Taharoa a significant incursion response was initiated with no Koi being detected. NRC has continued monitoring the site using eDNA and so far, no koi has been detected. A site led pestfish incursion response plan for Kai Iwi lakes complex will be drafted in partnership with Te Roroa, KDC and DOC. The pestfish surveillance approach is centred around our new camera surveillance tools, bathymetry mapping to determine feeder placement, and setup of shore-based blockade nets to catch pestfish. which will delivered through our partnership with mana whenua of the lakes. The team also commissioned 3D printed koi carp models which will be set in the water around shallow margins of Lake Taharoa to test whether drone surveillance might be an effective koi carp detection tool. The first initial trial of this work will be delivered in 2023-2024 once the final rendering of the koi models is completed. Ongoing development of the surveillance system and response plans for Waikare and Taharoa will be carried out in partnership with Te Roroa and KDC moving forward into 2023-2024.
Martins Dam	Dam	Department of Conservation (DOC) and Northland Regional Council continued surveillance work of Martins Dam (13th -16th March 2023). This is a DOC site listed as a high priority surveillance area based on the Stewart Smith diaries identifying it as an orfe release site. It was unknown if the orfe survived or hybridised with rudd or koi. A combination of gill, trammel, fykes were along with the floating feeder to determine presence/absence of this pest fish and whether it hybridised, koi were caught and there was no sign of hybridisation. DOC will provide results from DNA analyses of samples once completed. This will be reported on in the 2023-2024 operational report.

Location	Type of site	Activity undertaken 2022-2023
Lake Manuwai	Lake	Northland Fish & Game were carrying out a routine trout survey in Lake Manuwai in December 2022 and caught several small fish which could not conclusively be identified. Other than gambusia, no other pest fish species are known to be in the lake. To confirm presence / absence and identification of this unknown pest fish species NRC, DOC and Fish and Game conducted two small-scale netting operations in lake Manuwai on however no pest fish were located. Further work is planned in the new year 2023-2024 in partnership with Fish and Game and DOC.
Tangowahine, Awakino river	River system	A surveillance netting operation was carried out in May 2023 after reports of a die-off event for koi carp in a small drain connected to the Awakino river. No koi were captured through netting and the drain had been flushed of any dead fish through recent flooding. More concerted netting operation and eDNA sampling will be carried out in the Awakino river in 2023-2024 to confirm koi presence in the system.
Mangapai, Tauraroa river	River system	Due to the extent of increased fishing effort spread across all other summer surveillance sites, this river was not able to be surveyed in 2022-2023. Surveillance work is planned for this site in 2023-2024.
Parapara stream, Taipā	Stream	The river was visited in April (2023) by DOC and NRC where a netting operation in an un-surveyed section of the Parapara River using a range of netting methods (gill and fyke nets), as well as eDNA sampling to determine if koi carp were present. No koi were captured or detected by eDNA. Observations of goldfish by the surveillance team (DOC & NRC) in previous years monitoring (2022-2023) and the detection of goldfish from eDNA samples in consecutive years indicates a population of goldfish exists within the Parapara river. This was further supported by a local landowner report that goldfish were released into the river by his elderly grandmother. The past and future misidentification of koi carp for goldfish is likely for this river system. In line with previous years surveillance where both netting and eDNA evidence indicate no koi are present, the status of the site regarding koi carp will be changed to 'Not detectable'. However, the eDNA sampling (2022-2023) again detected grass carp which has strict regulations around the use and release. Grass carp have not been released by either NRC or DOC at this site. Previous detections were disregarded as cross contamination due to NRCs work with grass carp in other sites (use of waders and kayaks may have residual DNA fragments). The recent sampling was obtained without the need to use waders or kayaks so unlikely to be any cross-contamination. This result requires further investigation and while the containment status of koi carp can be changed to not detectable, surveillance to determine the presence of grass carp in the river will be necessary and this will be carried out in 2023-2024.
Ruawai	Drainage canal	During the summer surveillance operation (Jan 2023) water levels in the Ruawai drainage canal were too low to set nets. However, reports from a farmer that he had a koi carp in his cattle trough was investigated and goldfish were found. The fish had been pumped into the trough by a nearby drain which was fed by a large dam on the property. eDNA sampling alongside a small-scale netting operation will be carried out in 2023-2024 to confirm if koi are present.
Arapohue	Drainage canals	A netting operation was carried out in January 2023 during a major flooding event on the basis that pest fish access into the drainage network from the Wairoa River would be highly probable. However, despite significant widespread flooding in Dargaville and Ruawai districts (Jan 2023), water levels within the drainage network were still significantly low. No koi were captured within the drains and gill nets were only able to be set within a few fragmented pools. Additional information on the frequency of the floodgate usage will be sort from the Kaipara District Council will support timing of future netting efforts in the drainage system.

Location	Type of site	Activity undertaken 2022-2023
Makaka Creek, Te Kōpuru,	Creek	A small-scale netting operation was carried out Jan 2023 to determine presence/absence of koi carp, because of its proximity to other koi carp summer surveillance sites (Arapohue, Ruawai) and connection to the Wairoa River a potential source of koi carp. No koi carp were captured The river system had recently been dredged likely contributing to the lack of fish. Further netting in the 2023/24 year is required.
Kaka Street, Whangarei City	Drain	Two reports were received from the public of koi carp in the Kaka Street drain (Whangarei). The drain has been subject to many sightings over the years particularly during flood events and photographic images of orange, black fish resembling koi have all but confirmed their presence in the drain. However, recent netting (14 July 2023) revealed the fish were goldfish. Many of the fish captured were bright orange and had patches of black colouring on the head and spine matching images taken by the public in previous years. No other koi carp have been reported elsewhere within the drainage network, suggesting this is a small, localised population of goldfish. As this site is inside the containment area for koi carp will be changed from undetermined to not detectable. No further sampling will be carried out at this site.

Inside the containment area

New pestfish sightings within containment areas continue to be received, the assistance of a check clean dry advocate in responding to these reports has improved our capacity to respond and provide more advocacy, awareness and support to locals and landowners for these species and other workstreams within the pestfish programme. However, these populations represent an ongoing threat for expansion of these pests and there would be added value in further delimiting the progressive containment zones if resources allowed.

Netting operation at Martins Dam and floating feeder used to survey koi carp.

Perch

Image of progressive containment perch

Outside the containment area

Confirmed sites outside the containment area (none)

Potential sites outside the containment area (3 sites)

Location	Type of site	Activity undertaken 2022-2023
Wairua river, Pīpīwai,	River	A netting operation was carried out using fykes and trammel nets at this site resulting in only catfish and eels being caught. The site is scheduled for summer surveillance work in partnership with DOC for Apr 2023-2024
Mareretu	Pond and stream	No surveillance was undertaken in 2022-2023 due to the wide scope of work delivered across other river sites constraining capacity. This site was added based on a reference found in 2014 NIWA report. Surveillance will be carried out in 2023-2024 summer surveillance work streams.
Kaihu River, Dargaville	River	A report of a dead fish resembling perch (March 2023) in a roadside drain with connections to the Kaihu River 20km north of Dargaville was responded to within 3 days of receiving the request. The fish in question was not located where it was observed and couldn't be confirmed. Instead, a reconnaissance of the drain was completed and assessment of the connection to the larger Kaihu River carried out to assist with planning a surveillance operation in 2023-2024.

Inside the containment area

There are only a limited number of sites known to occur within the three containment areas, and these are relatively discrete sites. Progress could be made on managing the risk posed by these sites, however, without capacity to provide more advocacy, awareness and support to locals and landowners, these populations represent an ongoing threat for further range expansion.

Tench

Tench caught out of lake Kapoai - Dargaville

Outside the containment area

Confirmed sites outside the containment area

Potential sites outside the containment area

Location	Type of site	Activity undertaken 2022-2023
Arapohue	Pond	No surveillance undertaken in 2022-2023. The site was added after a reference was found in the Smith Diaries (a summary of historic release activities undertaken by Stewart Smith). Whilst the site is a low priority for follow up, an investigation in 2023-2024 to confirm its status will be carried out.

Inside the containment area

The progressive containment zone for tench is centred around the Waitangi River infestation that is not considered feasible to manage with current technology and resources.

Sustained control freshwater pests

Key points of the sustained control freshwater pest programme

- Enforcement of rules relating to sustained control freshwater pests.

Progress in achieving aims

Performance Measure	Result	Details
Request response time Response to requests from the public on sustained controlled pests will be responded to within 20 working days.	**Achieved**	**2020-21** / **2021-22** / **2022-23** **Public requests** 5 / 10 / 2 The council database reporting system is not currently able to report on request response times and requires modification to capture response data (rather than close date) for this performance measure

Two reports were received from the public regarding sustained control species in 2022-2023. The first was an unidentified fish species in Lake Manuwai (see details above). The second report was from Golden Bay Cement (Wilsons Dam Hikurangi) who reported catching a large number of catfish in their sediment pond during a flood event. A small-scale netting operation was undertake to remove catfish from the pond, goldfish were also caught. Management of the pond will include dredging it in summer. This will remove any future pest fish incursions from the pond and no further actions will be required.

Community engagement

Performance Measure	Result	Details
Community engagement - events Total number of engagement activities conducted to increase awareness of freshwater pests is maintained, or greater than the previous year.	**Achieved**	Refer Appendix for more details / **2020-21** / **2021-22** / **2022-23** **Field Days / A&P Shows** 1 / 0 / 3 **Community events / waka ama** 8 / - / 4 **School visits and workshops** 4 / - / 2 **Stakeholder activities** 3 / 1 / 1 **Pest workshops** 6 / 1 **Total** **22** / **2**

Community engagement events included the Check, Clean, Dry Campaign, attendance to the Whangarei Agriculture and Pasture show, Paparoa Agriculture and Pasture Show and Northland Field Days.

In addition, Check, Clean Dry training and biosecurity response surveillance tools training was provided to Mana Moana biosecurity ambassadors, Kaipara District Council staff and kaimahi rangers from Te Roroa at Kai iwi Lakes.

9. Marine Pests and Pathways
Riha tai me te huarahi ki mua

Background of the Marine Pathway Management Plan

Over the life of the Marine Pathway Management Plan council has the following aims:

- To increase the number of vessel owners or persons in charge of vessels complying with the pathways plan rules
- To increase the awareness of the risk hull fouling poses to marine pest spread
- To see a reduction in the rate of spread of established marine pests within Northland
- To help marine stakeholders, coastal marine area occupiers, vessel owners and the public to gain knowledge and skills to help reduce the impacts and spread of sustained control marine pests.

From 2010 council has had a species-led approach to managing marine pests. However, identifying current and potential marine pests for Northland is difficult, so rather than relying solely on the species-led approach, the council has also begun addressing the universal vector of spread. Mediterranean fanworm (Sabella spallanzanii) is one of many species that has entered the region via hull biofouling. Taking a proactive approach and enouraging cleaner hulls through a Marine Pathway Management Plan will result in fewer vessels carrying marine pests, such as Mediteraranean fanworm, and other biofouling into the region and reduce the risk of new marine pest incursions.

Marine pathway		
Hull fouling: Level of Fouling 2 (LOF2)		
'Light fouling' allowed, which means no more than small patches (up to 100 mm in diameter) of visible fouling, totalling less than 5% of the hull and niche areas.		
Asian paddle crab	Mediterranean fan worm	Undaria seaweed
Australian droplet tunicate	Pyura sea squirt	
Japanese mantis shrimp	Styela sea squirt	

Programme implementation 2022-2023

Programme implentation in 2022-2023 included:

The hull surveillance programme continued as per previous years with levels of fouling recorded and any vessel carrying a named marine pest in a location where that pest is not established placed under a Notice of Direction to have the vessel cleaned. Dive contractors were directed to perform in-water removals where possible on vessels with low levels of fouling to immediately mitigate risk.

Wherever possible, staff informed owners of their vessels level of fouling threshold, reducing the risk of vessels moving between designated places in breach of the Marine Pathway rules. Simultaneously, existing communication and engagement programmes have continued to assist vessel owners and stakeholders with ensuring compliance.

Where Notices of Direction were issued to the owners of vessels found with listed marine pests, these enforcement notices were tracked in IRIS (council's incident logging database) and regular contact was made with vessel owners to ensure they had met the requirements of the notice.

Progress in achieving aims

Introduction and spread of marine pests in Northland

Performance Measure	Result	Details
New marine pests Introductions of new marine pests to Northland are recorded and trends over the duration of the plan are analysed.	**Achieved**	New Pests Reported: **2019-20** / **2020-21** / **2021-22** / **2022-23** **From hull surveillance**: 1 / 0 / 0 / 0 **From external monitoring**: 2 / 0 / 1 / 2
Exotic Caulerpa (Caulerpa brachypus and Caulerpa parvifolia) was identified by hapū kaitiaki in Omākiwi, Bay of Islands in May 2023. This is the first time these species were recorded on mainland New Zealand. More information about this response below.		
Range extensions within Northland The spread of established pests to new designated areas within Northland are recorded and trends over the duration of the plan analysed.	**Achieved**	**2019-20** / **2020-21** / **2021-22** / **2022-23** **Range Extension Reports**: 6 / 1 / 2 / 0

Vessel compliance to the Marine Pathways Management Plan

Performance Measure	Result	Details
Hull survey The vessel hull surveillance programme will inspect a minimum of 2,000 vessel hulls annually	**Achieved**	New Pests Reported: **2019-20** / **2020-21** / **2021-22** / **2022-23** **Hulls surveyed**: 2,048 / 2,144 / 2,060 / 2,037
2,037 hulls were assessed, representing between 50 - 60 % of the vessels that pose a risk for the spread of marine pests in Northland.		
Vessel compliance reporting Compliance with the marine pest and pathway plan is recorded and trends over the duration of the plan are analysed	**Achieved**	Vessel compliance: **2019-20** / **2020-21** / **2021-22** / **2022-23** **Overall compliance Incidents**: 47.5% 145 / 44.6% 169 / 51.3% 194 / 55% 136

Hull surveillance and vessel compliance data is reported monthly in the Chief Executive's report to council.

Approximately 55% of the vessels inspected met the required biofouling threshold (these are vessels that would be compliant with the Marine Pathway Management Programme rules if the vessel moved between designated areas).

This summer the weather was relentless with Northland experiencing a continuous series of sub-tropical lows, atmospheric; rivers, and former tropical cyclones, resulting in greater than usual heavy rainfall. This persistent weather caused a significant portion of the fleet to remain stationary for extended periods, leading to increased fouling. Nonetheless, the surveillance program indicated that, on the whole, vessels were cleaner compared to past years. Additionally, divers noted that anchored vessels were notably clean with minimal biofouling.

The educational campaign emphasizing "clean before you go" is ongoing, ensuring vessel owners understand the importance of maintaining compliant vessels before moving.

CASE STUDY

Strengthening national marine partnerships

Marine biosecurity staff are actively collaborating with our regional Top of the North (TON) partners, including Auckland Council, Waikato Regional Council, Bay of Plenty Regional Council, Ministry for Primary Industries, and the Department of Conservation. Together, we have developed and populated a Marine Vessel Portal (MVP). This portal is designed to streamline data collection from users, stakeholders, and partner councils. Key entities such as marinas and haul-out facilities will benefit initially, but eventually, individual vessel owners will also find it easier to manage their biofouling and hull cleaning records through this system.

The MVP serves as a centralized vessel database, pivotal for implementing the Clean Hull Plan (a National Pathway Management Plan under the Biosecurity Act). It will trace and document vessels traversing regional boundaries. Additionally, the portal will allow the public and marinas to access specific information about vessels, whether they're looking up their own or those entering their facilities. Within the Top of the North area, there's an estimated count of 20,000 vessels on moorings and marina berths. This figure represents roughly 90% of all New Zealand's vessels. Impressively, since the onset of this financial year, the TON collaboration has successfully captured information for over 11,000 of these vessels. For the marine biosecurity team and other departments within the Council, the MVP emerges as an invaluable asset.

TON Partnership engagement 2022-2023

Newsletter subscribers	1,492
Facebook – total page likes	633
Facebook – reach	261,300
Instagram reach	20,3000
Website unique visits	30,200
Google ads and video impressions	>3,508,642
Google ad clicks	31,055
Google video views	297,530

24 incidents are recorded as not having been closed within 5 working days in the year. However, all incidents were risk assessed upon receipt, and a response implemented based on likely harm to the receiving environment. The reporting system requires modification to capture response data (rather than close date) for this performance measure.

Performance Measure	Result	Details
Incidence response All significant incidents are recorded, and a response plan is developed and implemented within 5 working days.	**Response time data not valid**	**2019-20** / **2020-21** / **2021-22** / **2022-23** **Incident response recorded as > 5 working days**: 58 / 32 / 24 / 25

Incursion responses 2022-2023

With support from Biosecurity New Zealand, council has funded several responses to marine pest incursions during 2022-2023.

Exotic Caulerpa, Te Rāwhiti

Caulerpa, a genus of green algae was first reported on INaturalist in New Zealand at Aotea, Great Barrier Island in late June 2021. Researchers from NIWA quickly identified the species as being unusual and organized for a sample to be sent for formal identification, this was later identified as two species which are morphologically similar (Caulerpa brachypus and Caulerpa parvifolia).

In May 2023, haukainga of Te Rāwhiti identified the exotic Caulerpa species, Caulerpa brachypus and Caulerpa parvifolia within their rohe. Once identification was formally confirmed, a collective of BNZ, council and local hapū, initiated a response. Together, hapū, council, and MPI established a joint strategy aimed at eliminating Caulerpa in Te Rāwhiti. Both a rāhui and a Controlled Area Notice (CAN) have been implemented. Furthermore, council and NIWA dive teams have made extensive efforts to gauge the extent of the infestation, using benthic mats and chlorine for treatment.

Caulerpa functions as an ecosystem engineer, dramatically altering our marine habitats. Its propensity to outcompete and replace native seagrasses and other benthic species, has the potential to set off trophic cascades, disrupting the food web from the base upwards. The current Caulerpa proliferation will diminish access to kai moana and significantly impact ecological biodiversity, and our way of life. Currently no treatment tools have been demonstrated to be effective at removing exotic Caulerpa on the scale of the infestations seen in New Zealand. Since the first detection, BNZ has been following a containment strategy: working to reduce the spread of exotic Caulerpa from known infestation sites.

Biosecurity responders and communities are assessing the feasibility of different tools to identify a scalable and effective means for achieving eradication, local elimination, or control, while taking the environmental impacts into account. Suction dredging has been a viable and useful tool in a seaweed pest management strategy in overseas locations however, it needs to be trialled in Aotearoa to gather information on how effective it is in Aotearoa's ecosystem, the types of habitats it can be applied, cost, logistics, impacts on other species and habitats, impact on the Mauri of the ecosystem, and the extent of follow-up needed.

As such NRC, BNZ, and local hapū have been working towards a proof-of-concept trial in Te Rāwhiti (Bay of Islands) to test the effectiveness and efficiency of suction dredging, with and without secondary treatment, at removing exotic Caulerpa on the scale of greater than one hectare of infestation. The objectives of the proof of concept are to understand the efficacy and consistency of the treatment protocol on sites equal to, or greater, than 1-hectare, the efficacy and consistency in different substrate types and exotic Caulerpa densities and the ability to remove above-surface, surface, and/or subsurface exotic Caulerpa biomass. The trial also aims to understand the risk of spreading exotic Caulerpa fragments created by the in-situ removal operations, and the impact of treatment protocols on the Mauri and ecology of the area. Implementation of the trial is targeted for October 2023.

Caulerpa brachypus and Caulerpa parvifolia within Omākiwi Cove, Te Rāwhiti Bay of Islands May 2023.

Annual Report on the Biosecurity Operational Plan | 2022 - 2023

Whangaroa Harbour

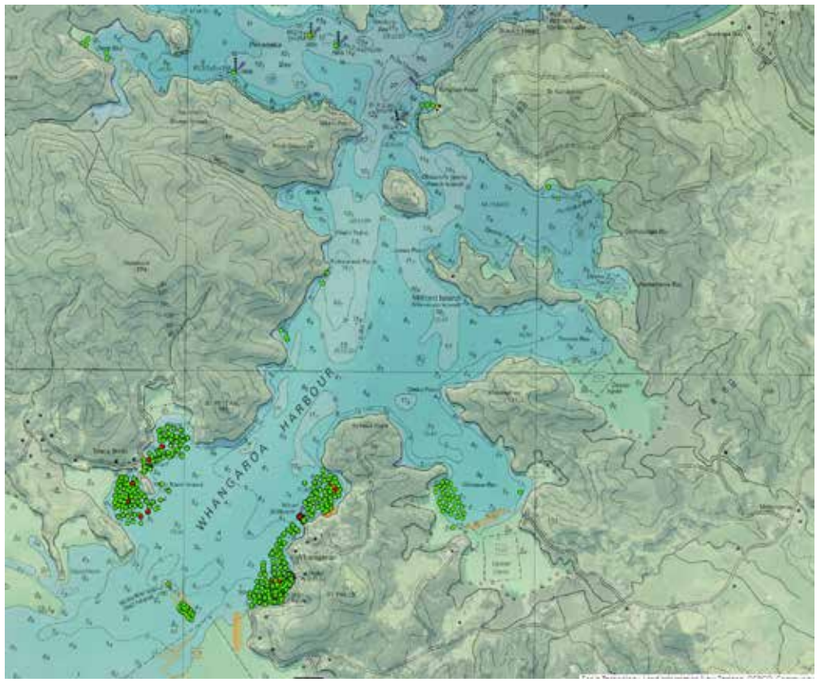
In 2021, the Mediterranean fanworm, Sabella Spallanzani (Sabella), was reported on structures within an oyster farm in Whangaroa Harbour. A comprehensive search of the marina and surrounding area in July 2021 revealed additional Sabella on marina piles, the seafloor, and under the wharf at Totara North. No Sabella were detected on vessels, whether in the marina, on anchor, or on moorings. However, Sabella was identified on mooring blocks and lines near Motu Kauri Island.

In November 2021, dive contractors undertook another comprehensive survey of all structures within the Whangaroa Marina and a broader delimitation survey within Whangaroa Harbour to determine if Sabella had spread beyond the marina. They discovered two large clusters of Sabella on the marina's seafloor (referenced image below) with a total of 118 specimens found and removed from the entire survey area. These specimens had an average size of 322 mm, ranging from 40 mm to 700 mm. The clusters in the marina are unlikely to have arisen from natural recruitment and may be due to dumping or vessel scraping, though the exact cause remains uncertain. It is probable that these clusters seeded the broader population within Whangaroa Harbour.

An estimated growth rate of 10 to 20 mm per month suggests that the Sabella's establishment in the Whangaroa Marina dates back approximately 1 to 2.5 years (± 2–4 months). However, this estimation doesn't account for potential seasonal growth fluctuations, due to a lack of local data. There's anecdotal evidence suggesting even higher growth rates (~50 mm per month), which would reduce the establishment timeframe.

A follow-up survey in May 2022 revealed three live specimens on pontoons on the marina's western edge. Another survey in September 2022 identified a single 220 mm Sabella under the Clansman wharf. February 2023 saw another comprehensive search in the marina and adjacent bays, resulting in the removal of 13 Sabella, primarily from the mooring field north of the Clansman wharf. A subsequent search in August 2023 across the marina and broader Whangaroa Harbour yielded 16 Sabella, with the majority found at or below the Clansman wharf, and the remainder at Totara North and near Motu Kauri Island.

Eradication of the Sabella population should be achievable with regular, repeated surveys. Staff will continue to conduct biannual surveys in the coming years.



Location of the search areas and transects (orange lines). Green dots represent where Sabella spallanzanii was absent and red dots represent were Sabella was present.

Top panel: Location of the two clusters of alive Sabella spallanzanii found within the Whangaroa Marina. Bottom panel: One of the large clusters of Sabella located on the seafloor within the Whangaroa Marina (right panel) and the largest Sabella measured from the cluster (left panel).

Community engagement

Performance Measure	Result	Details				
Community engagement – events and activities A minimum of two engagement activities are conducted annually to facilitate an increased awareness of the risk hull fouling poses to the spread of marine pests.	**Achieved**	Refer Appendix for more details	**2019-20**	**2020-21**	**2021-22**	**2022-23**
		Boat shows and community events	1 19	4 20	9	16
		School visits / workshops	2	5	6	10
		Stakeholder activities	6	3	1	2
		Marine pest workshops	4	3	2	3
		Total	13	15	18	31

Education and Advocacy

Institute of Oceanographic Studies (Tri-Oceans)

Marine Biosecurity staff recently developed an educational and advocacy relationship with the Institute of Oceanographic Studies' "Tri-Oceans" programme, based in the Bay of Islands. Tri-Oceans is a collective of scientists and innovators. Their academic background is centred on marine mammal science and marine education, and they aim to conduct high-quality research, inspire conservation through education, and integrate Mātauranga Māori with modern science techniques. Staff supported the Tri-Oceans Career Explorations Day with a practical demonstration of how to use a GoPro camera on an extendable pole at Doves Bay Marina. The use of the pole camera enables staff to conduct hull inspections of vessels without needing divers. Staff also explained the Level of Fouling (LoF) metric that is used in NRC's Hull Inspection programme. A marine pest identification and Sabella dissection workshop were also conducted with students and staff from Tri-Oceans.ion of the trail is targeted for October 2023.

Top panels: NRC staff and students from Tri-Oceans Institute at the Doves Bay Marina conducting marine hull surveillance using a pole camera. Sabella dissection Bottom panel: Marine pest identification workshop.

North-Tec / Te Pūkenga student project

As part of the North Tec / Te Pūkenga Negotiated Research programme, marine biosecurity staff supported the completion of a laboratory experiment examining the tolerance of Sabella Spallanzani (Sabella) to freshwater. The aim of this research was to test the salinity tolerance of Sabella. To do this, individual Sabella specimens from two different size classes – non-reproductive (10-150mm) and reproductive (greater than 151mm) – were exposed to four different concentrations of seawater: High, Medium-high, Medium-low, and Freshwater. This exposure lasted for 21 hours, after which their behaviour and mortality were recorded.

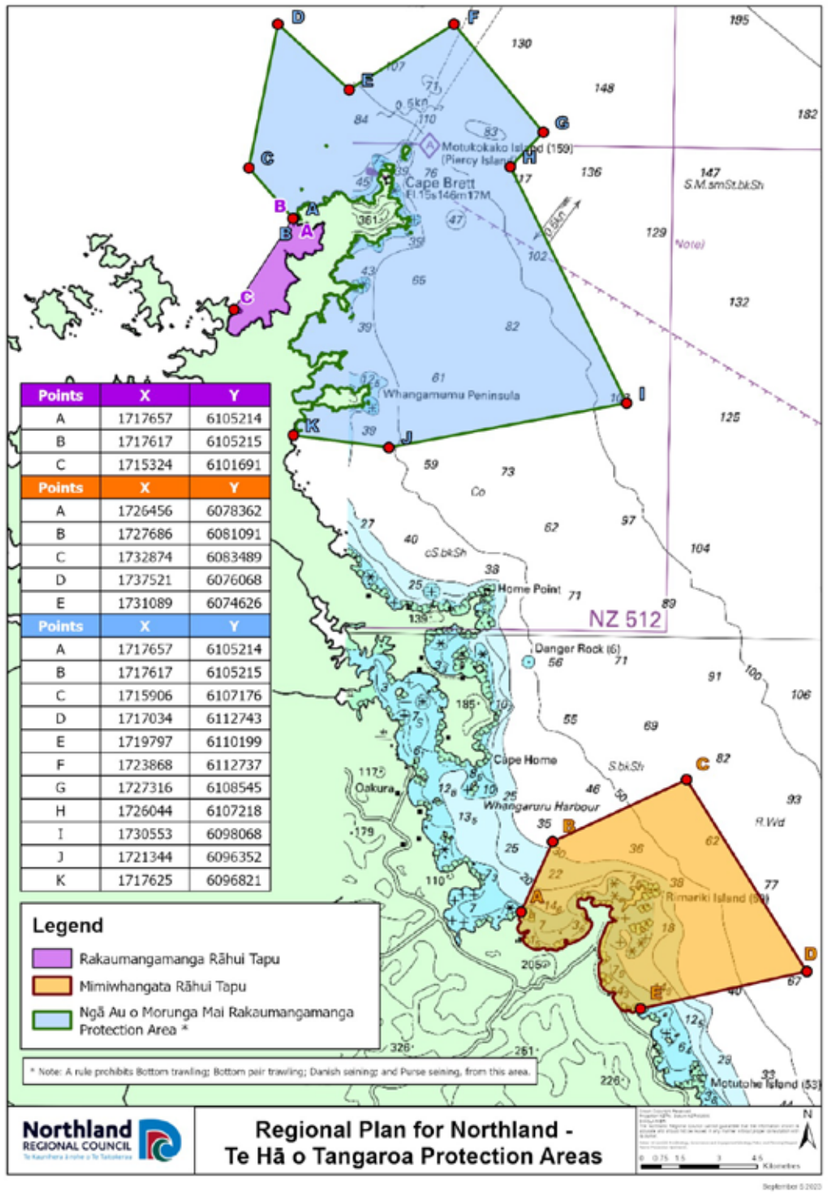
Results showed that the salinity treatment had a significant effect on Sabella's mortality. Both size classes experienced 100% mortality in the freshwater treatment. In the medium-low salinity treatment, 100% mortality was observed in the small size class, while 80% mortality was observed in the large size class; however, this difference was not statistically significant. In the medium-high salinity treatment, the small size class had 20% mortality, but there was no observed mortality in the large size class. Lastly, no mortality was observed in the high salinity treatment for both size classes.

Experimental set up for the salinity tolerance trial on Sabella spallanzanii (Mediterranean fanworm).

Rāhui Tapu / Marine Protected Areas

Northland Regional Plan

In addition to the Marine Pathway and Pest Management Plan, marine biosecurity staff are implementing the new rāhui tapu/marine protection rules which are now operative at Mimiwhangata peninsula and Maunganui Bay (Deep Water Cove) to Opourua (Oke Bay), including commercial seining and trawling restrictions around Rakaumangamanga (Cape Brett) as shown in the map below.



Points	X	Y
A	1717657	6105214
B	1717617	6105215
C	1715324	6101691

Points	X	Y
A	1726456	6078362
B	1727686	6081091
C	1732874	6083489
D	1737521	6076068
E	1731089	6074626

Points	X	Y
A	1717657	6105214
B	1717617	6105215
C	1715906	6107176
D	1717034	6112743
E	1719797	6110199
F	1723868	6112737
G	1727316	6108545
H	1726044	6107218
I	1730553	6098068
J	1721344	6096352
K	1717625	6096821

Northland
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Te Kaunihera ā rohe o Te Taitokerau