

Biodiversity Team

Te Tira Rerenga Rauropi

Annual Report 2023-2024



Foreword

Nau mai, haere mai

It is a privilege to present this year's annual report from our Biodiversity Team. Our biodiversity is a taonga—a treasure—and its preservation is a responsibility we all share. This report not only showcases the progress we've made in conserving Northland's unique ecosystems, but also underscores the importance of collaboration and partnership. Everyone across Te Taitokerau plays a part, from those who support the mahi financially through their rates, to those who are working on the ground, it all adds up to a network of people contributing to looking after our biodiversity taonga.

Among the notable features of our natural heritage are Northland's dune lakes. These are exceptionally rare ecosystems, unique not just to Aotearoa New Zealand, but are recognised globally. Through long-term monitoring of these systems, the team has deepened our understanding of how severe weather impacts lake health, reminding us that the wellbeing of these lakes cannot be taken for granted. This is made all too clear when the team observed, through their monitoring work, that Lake Taharoa (one of the Kai Iwi Lakes) suffered major vegetation loss following Cyclone Gabrielle. Although caused by a natural event, what we need to remember is that these are fragile systems that are already under pressure from human activities.



Ruben Wylie

Pou Tiaki Taiao – GM Environmental Services

Northland Regional Council is committed to giving effect to our obligations under Te Tiriti o Waitangi. Part of this commitment is about being an active Te Tiriti partner through developing and maintaining meaningful relationships with tangata whenua of Te Taitokerau. You will see throughout this report the partnership mahi that the team has been involved in. Through these partnerships, the team is laying the foundations for an enduring management approach that respects and supports kaitiakitanga.

We want to acknowledge the partnerships that have been developed through the mahi reported here, and importantly we would like to take this opportunity to thank the iwi, hapū, marae and whanau who have given their time, knowledge and expertise.

Looking ahead, our region's biodiversity faces a range of challenges. Climate change, habitat loss, invasive species, and the pressures of increasing human activity all threaten the delicate balance of Northland's unique ecosystems. These issues require an enduring response and it is not something we can do alone. Northland Regional Council's focus for future years will be to continue strengthen our partnerships with tangata whenua, and continue to work with local communities.

¹Department of Conservation, 2014, p. 28. Northland Conservation Management Strategy 2014-2024.

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1 Tīmatanga kōrero

Introduction



Vision

“Northlanders value and care for the region’s biodiversity and work together to ensure it is sustained now and into the future.”

Background

Te Taitokerau (Northland) is a hotspot for biodiversity with many rare and unique plants, animals and ecosystems found nowhere else on earth. Northland’s richness of species and ecosystems is a result of our mild climate, coastal influence, diverse soils and landforms, and long geological periods of isolation from the rest of Aotearoa New Zealand.

Northland’s natural ecosystems occupy around 33% of the approximately 1.25 million hectares. Around half of this is public conservation land and there are many high value areas on private or Māori land. Most of the natural lowland forests and wetlands have been impacted by development.

Northland is where the two main ocean systems meet resulting in a coastline with the greatest marine biodiversity in New Zealand and including many islands, bays, estuaries and dunes. A large proportion of original duneland has been converted to forestry and pasture while remaining dunes are under threat from pest plants and animals and human impacts such as driving vehicles on beaches and dunes.

Northland Regional Council’s role in the maintenance of biodiversity can be described as supporting environmental and habitat management interventions which can occur in the marine, terrestrial, and freshwater environments. These actions include habitat and species restoration or management of adverse effects.

Relevant statutes relating to biodiversity management include the Resource Management Act (RMA) 1991, Biosecurity Act 1993, Local Government Act 2002, Environmental Reporting Act 2015, Marine Reserves Act 1971, and Maritime Transport Act 1994. NRC policies or plans relating to the Biodiversity team’s work include Regional Policy Statements and Plans including the Northland Regional Pest and Marine Pathway Plan (2017-2027).

The National Policy Statement for Biodiversity (NPS-IB) 2023 gives direction to councils around protecting, restoring, and maintaining indigenous biodiversity across Aotearoa New Zealand. It sits alongside the National Policy Statement for Freshwater Management (2020) and the NZ Coastal Policy Statement (2010). These policy statements align with global biodiversity commitments and give effect to Te Mana o te Taiao - New Zealand’s Indigenous Biodiversity Strategy 2020 and recognise increased opportunities for developing partnerships with Māori.

A work plan is developed annually by the Biodiversity team which outlines deliverables and performance targets. Strategic documents and projects include the Northland Lakes Strategy, Review of Northland Lakes Strategy and recommendations for the future (2021), Top Wetlands Project, and Northland Biodiversity Actions and Ambitions of the Northland Regional Council (draft) 2018-2028.

The Biodiversity Team’s main role is about fostering enduring partnerships with iwi/hapū and the community to enable and encourage people to look after our biodiversity, sustain the environment and deliver essential benefits to all Northlanders. Ultimately, the state of Northland’s environment is determined by our people and visitors.

Team Expertise

Lisa Forester

Biodiversity Manager

Team lead, botany, threatened plants, weeds, lakes and wetland management, native forests.

Jacki Byrd

Freshwater Specialist (Team Deputy)

Freshwater Improvement Fund (FIF) Dune Lakes Project Manager, lake management, aquatic pest weed control, land management.

Laura Shaft

Senior Biodiversity Advisor - Coastal

Coastal workstream lead. CoastCare programme co-ordinator, dune restoration, dune monitoring, nature-based solutions for coastal hazards, community engagement, support for oiled wildlife response.

Katrina Hansen

Biodiversity Specialist

Native birds and wildlife, wetland programme co-ordinator, freshwater ecology, wetland monitoring, oiled wildlife response lead Northland and MNZ National Response Team, data management and analyst, NRC programme auditor.

Stevie (Stephanie) Tong

Biodiversity Advisor

Botany, bird, bat and lizard survey and monitoring, terrestrial ecology, terrestrial and wetland monitoring, community engagement, iwi/hapū partnerships.

Brooke Gray

Biodiversity Advisor - Coastal (On Parental Leave)

CoastCare programme, dune restoration, dune monitoring, and community engagement.

Stephanie Membery

Biodiversity Advisor

Native birds and fish, freshwater biodiversity, biodiversity education and communications.

Maria Seeker

Biodiversity Advisor - Coastal (fixed term)

CoastCare programme, dune restoration, dune monitoring, coastal education and engagement.

Claire Heyns

Biodiversity Advisor (fixed term)

Native fish, pest fish control, Check Clean Dry Advocate, assists with wetland monitoring.

Biodiversity Support staff

Sandra Harris - *Biodiversity Admin*

Charly-Jade Cairns - *Biodiversity Casual - Coastal*

Marley Ford - *Biodiversity Casual - Botanist*

Winiwini Kingi - *Biodiversity Casual - Cultural Advisor*



Maria Seeker, Katrina Hansen, Lisa Forester, Jacki Byrd, Stephanie Membery, Stevie (Stephanie) Tong, Laura Shaft and Claire Heyns (front)

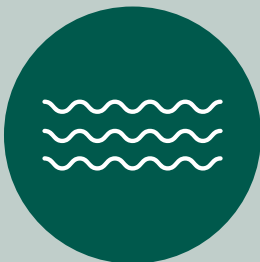
Practical Biodiversity Management

Biodiversity delivery actions are undertaken by Council in the following areas:



Freshwater

- Lake ecological monitoring
- Iwi/hapū partnerships for freshwater management
- Freshwater Improvement Fund Dune Lakes Project
- Coordination of Council's wetland programme
- Wetland advice and restoration plans
- Wetland monitoring
- Freshwater partnerships and community capability building
- Threatened species monitoring and management



Coastal

- Dune restoration and protection advice and implementation
- Support network of CoastCare Groups
- Iwi/hapū partnerships for dune protection and restoration
- Vehicles on beaches working groups and advocacy
- Dune health assessments and monitoring
- Coastal education and awareness events and communications
- Support Kaitiaki Takutai Ranger programmes



Terrestrial

- Terrestrial monitoring and surveys
- Assist community led Bioblitz and biodiversity surveys
- Communications - terrestrial education and awareness
- Terrestrial iwi/hapū partnerships
- Supporting building community capability
- Threatened species monitoring and management

2 Whakarāpopoto ā pūtea

Financial Summary



Overall, for the Biodiversity budget, had a favourable variance of \$44,527 (5.17% expenditure) at the end of June 2024. Over and under-expenditure across the workstreams balanced out to a small underspend.

Biodiversity Activities 2023- 2024	Budget (revised)	Actual	Variance
Expenditure	\$892,347	\$851,457	\$40,889
Revenue	\$33,648	\$37,286	\$3,638
Operational surplus	\$-858,699	\$-814,171	\$44,527

External funding was received from the Ministry for the Environment in a 50% co-funded agreement with NRC through the Freshwater Improvement Fund for hornwort (*Ceratophyllum demersum*) control in five dune lakes (see page 31 for further details on this project):

- Ministry for the Environment contribution 2023/2024: \$33,648
- Northland Regional Council contribution 2023/2024: \$38,939
- FIF (Freshwater Improvement Fund) Dune Lakes Project 2023/2024 budget total: \$72,587

We support dune restoration and terrestrial projects through the Council's Environment Fund (EFund).

Partnership activity	Details				
Council-supported programmes	Environment Fund	2020-21	2021-22	2022-23	2023-24
Environment Funds granted for the community	CoastCare dune restoration projects	\$38,766	\$20,522	\$34,012	\$42,642

Each year the council provides funding for fencing waterways, wetlands, and terrestrial forest habitats with the aim to support communities, tangata whenua and landowners to care for their land and water. This mahi (work) is largely administered by the Land Management team through the Environment Fund and through contracts with central government (Ministry for Primary Industries and Ministry for the Environment). We have included the funding that was utilised for the benefit of biodiversity during the 2023-2024 financial year.

The 2023-2024 funding year saw a total of \$547,743 of NRC Environment Fund delivered across Northland to support improved water quality and biodiversity outcomes.

Breakdown of the Environment Fund administered by the Land Management team for biodiversity outcomes in 2023-2024

Project type	Amount
Fencing waterways	\$382,241
Fencing wetlands	\$120, 272
Fencing forest habitats	\$45,230

Fencing of 15 wetlands through the Environment Fund via the Land Management team, including five of the Top 150 ranked wetlands. Terrestrial Environment Fund fencing projects organised by the Land and Biodiversity teams included five blocks, totalling 113ha retired.

Biodiversity Levels of Service

The Levels of Service listed in the Northland Regional Council's Long-Term Plan 2021 to 2031 for Biodiversity state that "Indigenous biodiversity and ecosystems are maintained and enhanced, particularly around our rivers, lakes, wetlands and coastal margins".

Performance Measures	Expected targets and detail	2023/24 Result
Number of plants provided through the CoastCare programme	<p>Target plant numbers: 2023/24 FY: 16,000 2025/31 FY: 15,000</p> <p>Plant numbers are recorded in a spreadsheet broken down to species and site for each planting season.</p> <p>The total numbers of plants each financial year are collated and added into a separate spreadsheet showing plant numbers per financial year (reported in Quarters 2 and 4).</p>	<p>14,672 – not achieved.</p> <p>In the first half of the financial year plant numbers were down due to losses in the nursery because of unfavourable weather, therefore numbers delivered were down from that estimated.</p> <p>Because of the increased costs of plants, we were not able to catch up on numbers in the second half of the financial year.</p>
Number of top-ranked lakes identified in the Northland Lakes Strategy that are under active management² with stock excluded	<p>Target number of lakes: 20</p> <p>LTP LOS target is 95% of the 20 lakes. The lakes are listed and ranked in the Northland Lakes Strategy.</p> <p>Monitoring records and recommendations for "active management" are recorded as part of annual lakes ecological monitoring reports undertaken by NIWA.</p>	<p>Achieved</p> <p>10 lakes received ecological monitoring, weed control was undertaken in 6 lakes and pest plant surveillance in 4 lakes.</p>

The Freshwater Improvement Fund (FIF) Dune Lakes project extension ran until June 2024. The outcomes of this project extension, as agreed with the Ministry for the Environment, our funding partner, are outlined in the table below.

Project	Expected outcome	Details
FIF Dune Lakes project	Achievement of hornwort <i>C. demersum</i> control and Māori partnerships workstreams objectives in the form of reports and invoices submitted to the Ministry for the Environment.	Objectives have been met for hornwort <i>C. demersum</i> and Māori partnerships workstreams and the project is now finished and closed off by MfE.

²Active management includes basic care standards for lakes: nutrient management, ecological monitoring, submerged weed surveillance, and weed and pest control if necessary.



Clockwise from top: Regionally rare Sphagnum moss *Sphagnum perichaetiale* (Range Restricted) (First time recorded fruiting in New Zealand). Ahipara; Threatened (Threatened - Nationally Endangered) gumland liverwort *Goebelobryum unguiculatum*. Ahipara; Pygmy Clubmoss *Phylloglossum drummondii* (Nationally Critical) in gumland. Ahipara. Only found in Northland; Lichen *Cladonia floerkeana* in gumland. Ahipara; At Risk - Naturally Uncommon lichen *Erioderma leylandii* in gumland. Ahipara.

3 Mahi tahi

Collaboration and engagement



BIODIVERSITY'S COMMUNITY ENGAGEMENT IN 2023/24

1 WETLAND SYMPOSIUM



FRESHWATER EDUCATION EVENTS **5**



57 MEDIA STORIES 10 PRINT MEDIA ARTICLES
8 NRC WEBSITE STORIES
39 SOCIAL MEDIA POSTS

PARTNERSHIP VALUES ASSESSMENTS **3**



29 COASTCARE EVENTS



2 CAMPAIGNS FOR INTERNATIONAL & NATIONAL CONSERVATION DAYS

Conservation Week
World Wetlands Day

THREATENED SPECIES WEB PAGES **7**



Partnerships

NRC is committed to working with Māori. The Biodiversity team works extensively to develop more meaningful and enduring relationships with Māori, support their capacity to undertake work themselves, participate in decision making and exercise kaitiakitanga (guardianship). Building knowledge together is an important component of this.

The following targets demonstrate our commitment to continuous improvement in collaboration and engagement with Māori. These targets were set by our team and align with Tāiki ē: NRC Te Tiriti Strategy and Implementation Plan.

Target	Result	Details
Bicultural collaboration	Achieved Many collaborations in 2023/24, building on at least 8 collaborations in 2022/2023	At the end of 2023-2024, the Biodiversity team had new, strengthened, and/or ongoing collaborative relationships with hapū, whānau or iwi as follows: <ul style="list-style-type: none"> Working with Te Uri o Hau iwi to remove hornwort from Lakes Karaka and Tutaki on the Poutō Peninsula Hui held with six iwi to establish our shared goals for improving lake health (Ngāti Kuri, Te Aupōuri, Ngāi Takoto, Te Rarawa, Te Roroa, Te Uri O Hau) Coastal Biodiversity staff working closely with iwi and hapū right around the region on coastal restoration and monitoring with collaborative events including working bees, planting days, seed collection and information sharing workshops. Collaboration at Paradise Shores with Patuharakeke, Aki Tai Here, Weed Action, Bream Bay Coastal Care Trust and NRC CoastCare to improve dune health Weed control working bees at Ocean Beach with Aki Tai Here, Weed Action, Bream Head Trust and Ocean Beach Habitat Restoration Bream Bay dune fauna monitoring with Patuharakeke Workshop with council, Northtech, Ngā Kaitikai o Ngā Wai Māori and Ngāti Kahu o Torongāre on freshwater/invertebrate survey methods at Tāika (Mt Tiger). Bioblitz involving Biodiversity and Biosecurity staff at Maromaku on Ngāti Hine farm with kaimahi, including training around pest, weed and wetland management. This included delivery of a report and recommendations. Ngatirua te taiao aromatawai survey Taupo Bay/Whangaroa Ngāhere collaborative survey between Ngatirua, Manaaki Whenua Landcare Research and NRC, including seven days of field work for three staff. Waka Hourua Mātauranga Māori Collaboration between Aki Tai Here, The Department of Conservation and Weed Action Trust on training, survey and protection of threatened plants. Kāpehu Marae kahikatea wetland values assessment.
Bicultural capability All permanent staff achieved competency in Level 1 in council's Te Whāriki workshops	Ongoing	All permanent staff will have achieved competency in council's Te Whāriki workshops. Seven out of eight staff in the Biodiversity team have achieved competency in Te Whāriki Level 2 workshops. New staff member achieved Te Whāriki Level 1.
	Achieved	Team members regularly contribute to and attend Kotahitanga Training. All staff attend regular (weekly) Kotahitanga Training sessions where we practise karakia, mihimihi, pronunciation, basic conversations, tikanga practises and learn new kupu (words) together

Internal collaboration

In addition to collaboration with the public, the Biodiversity team works in conjunction with many internal teams at NRC. The table below summarizes some of the collaborations carried out this year.

Team	Collaboration
Biosecurity	<ul style="list-style-type: none"> • Lake Taharoa biosecurity checks for gold clam (<i>Corbicula fluminea</i>) • Te Ketekete Lagoon gypsywort (<i>Lycopus europaeus</i>) site visit • Royal fern (<i>Osmunda regalis</i>) planning for dune lakes • By-kill surveys in dune lakes via kayak • Contribution to the application to EPA reassessment for the continued use of herbicides. • Lake Taharoa Operational Hui • Maromaku Bioblitz on Ngāti Hine farm with kaimahi values assessment, monitoring and training around animal pest and weed control and wetland management • Hurupaki School wetland learning day • Jack's Bush weed blitz and team building day • Both teams sharing eDNA results from lakes • Wetland weeds presentation at wetlands training course run by Biodiversity Team • Tāika forest biodiversity management • Rabbit control in Ruakākā Wildlife Refuge • Pest weed reports Biosecurity Weed Team
Water quality	<ul style="list-style-type: none"> • Lake Taharoa Operational Hui • Projects to identify locations of kākahi (<i>Echyridella menziesi</i> and <i>E. aucklandica</i>) - freshwater mussels and piharau/lamprey (<i>Geotria australis</i>) populations in the region • Supporting the eDNA data project for all NRC teams to share and access results • Tāika forest fish biodiversity monitoring site integration into regional SOE programme
Māori Engagement	<ul style="list-style-type: none"> • National Wetland Trust Symposium Waitangi – Biodiversity and Māori Engagement team on organising committee and worked together on delivery
Regulatory Services	<ul style="list-style-type: none"> • Compliance – Freshwater fish species assessments at fish barriers including Tāika forest • Compliance – Advice around wetland enforcement and prosecutions • Consents – Advice on a number of consents concerning wetlands • Consents – Consents Manager runs wetland regulatory presentation at wetland training course run by Biodiversity Team • Consents – advice and referral of applicants for nature-based options for coastal erosion mitigation – multiple sites • Compliance Monitoring – advice on coastal works impacting wildlife and natural ecosystems. Vehicles on beaches signage and implementation of Regional Plan rules.

Team	Collaboration
EnviroSchools	<ul style="list-style-type: none"> • Beststart Pipiwai Road – Freshwater stream investigations • Hurupaki Primary School – Wetland education, activities and restoration planting • Seaweek – including CoastCare activity at EnviroSchools Encounters event at Matarau School
Communications	<ul style="list-style-type: none"> • Freshwater lake fish card identification resource (included Biosecurity, Water quality and EnviroSchools teams) • Public and social media biodiversity posts • CoastCare e-newsletters and online stories • CoastCare and vehicles on beaches on-site and event signage • Wetland Symposium NRC co-hosting the event at Waitangi across three teams • Events e.g. Field days, Seaweek, education events, working bees • Hurupaki School Wetland learning day and planting day
Land Management	<ul style="list-style-type: none"> • Contribute biodiversity content to Hills to Harbour newsletters • Wetland Training run by Biodiversity Team • Advice to Land staff around wetlands and Top Wetlands Project. • High value lakes catchment restoration to improve water quality • Bat and bird survey, monitoring and training in Tāika forest • Advice from Land Team around soils, erosion and land management
Natural Resources Science	<ul style="list-style-type: none"> • Lake Scientist supports Taharoa Domain Operational Group hui • Coastal Science – dune monitoring, coastal research (working with universities and research organisations), dune extent mapping. • KiEco – Data Team – Biodiversity support project and implementation of biodiversity structure. Working on Freshwater Fish, Birds and Dune plants taxonomic lists.
Policy & Planning	<ul style="list-style-type: none"> • Developing a Biodiversity Strategy • Wetland mapping project • Advice and input to Policy and Plans e.g. Threatened Freshwater Dependant species • Development and implementation of beach vehicle exclusion zones • Advice to WDC (on request) on dog control on beaches and other coastal areas
Emergency Management	<ul style="list-style-type: none"> • Part of the initial Ngā Manga Atawhai Reference Group
Maritime	<ul style="list-style-type: none"> • Oiled wildlife response and training
Climate Action and Natural Hazards	<ul style="list-style-type: none"> • Beach profiles, coastal hazards and adaptation, guidelines for coastal works, holistic coastal management engagement
Environmental Services Group	<ul style="list-style-type: none"> • Part of ESG group aimed at supporting, promoting and improving working in partnership with Māori.
Multi Team	<ul style="list-style-type: none"> • Facilitate an informal coastal group for staff across council to share activities and events. • Part of a cross council lakes team to ensure we are working collaboratively to achieve lake outcomes.

Events



Events are a vital part of the community engagement work carried out by the Biodiversity team. Between July 2023 and June 2024, the Biodiversity team organised, assisted with, or attended many successful events, including:

- **Co-hosting the National Wetland Symposium in Waitangi 10-12th April with the National Wetland Trust**
- **Wetland education event at Hurupaki School and subsequent planting day**
- **BioBlitz with Ngāti Hine Forestry Trust,**
- **Freshwater education days with BestStart Pipiwai Road**
- **Co-creation of Te Ao Māori fish ID guides and launch at Pawarenga with four kura.**
- **CoastCare staff attended 29 events. This included 11 planting days and 8 other working bees with community, iwi and schools at sites including Ngunguru, Matapōuri, Taipa, Glinks Gully, Ruakākā, Langs Beach, and Ocean Beach. Nine education/advocacy events were attended, including the Labour Weekend Ripiro Beach Muster, organised by KDC.**
- **Seaweek events included an Enviroschools event and a Bream Bay beach cleanup.**

Hurupaki School wetlands education day

On Wednesday, 9 August a Wetland Education Day was held at Hurupaki School, a primary school in Whangārei District with a wetland on their grounds.

Hurupaki is a silver Enviroschool and wanted to engage their tamariki with the wetland, to give them a greater understanding of the importance of these vital ecosystems and how to take care of them.

[Read more](#)



The Biodiversity team hosted the Tū I te Ora Scholarship winner Stephanie Membery who worked in the team over summer and went on to secure a permanent role at the NRC.

CASE STUDY

Hurupaki School wetland restoration

The Biodiversity team was approached by NRC's EnviroSchools Coordinators to provide advice on wetland restoration at Hurupaki School. Hurupaki is a silver EnviroSchool and wanted to engage their tamariki with the wetland on the school grounds, to give them a greater understanding of the importance of these vital ecosystems and how to take care of them.

We provided advice on what to plant and where, then hosted a wetland learning day for the whole school. Staff from the Biosecurity and Biodiversity teams, along with staff from Eco-Solutions, were welcomed by students in a haka pōwhiri. The whole school congregated for this welcome and it set the tone for a special day.

During the event, students learnt about the important role that wetlands play in ensuring clean, healthy water, and about the rare fauna and flora they support. Games were played, bug hotels were built, and wetland plants were identified. Students also learnt about the threats posed by pest plants and animals and how to control them. All the learning took place in and around the wetland on the school grounds.

After the event, the Principal of Hurupaki School commented: "There has been heaps of positive feedback from staff with a number of them saying they learnt a lot themselves. Environmental education is such an important part of our learning but can often not receive the time it deserves. Having days like this in our school really brings it to the forefront again and helps our students and teachers learn more about the amazing environment that we have here at Hurupaki."

Hurupaki School accessed funding from Toimata Foundation, through their One Billion Trees partnership, to purchase over 500 native plants which were planted over two days in a very successful follow up event that again involved the whole school. Students removed weeds that were smothering the riparian zone and replaced them with the native seedlings, including harakeke / flax (*Phormium tenax*), nīkau (*Rhopalostylis sapida*) and various *Coprosma*, and *Carex* sedges.

The NRC distributed Environmental Leaders Fund supports the school to continue their important wetland restoration mahi (work) and Biodiversity staff have continued our partnership in providing advice and guidance.



CASE STUDY *cont...*

Hurupaki School wetland restoration



Before weed removal by the students (left) and after weed removal and planting of native seedlings (right) visible in this image with wool weed suppression mats.



Before weed control (left) and after (right)

Social Media and Media Engagement

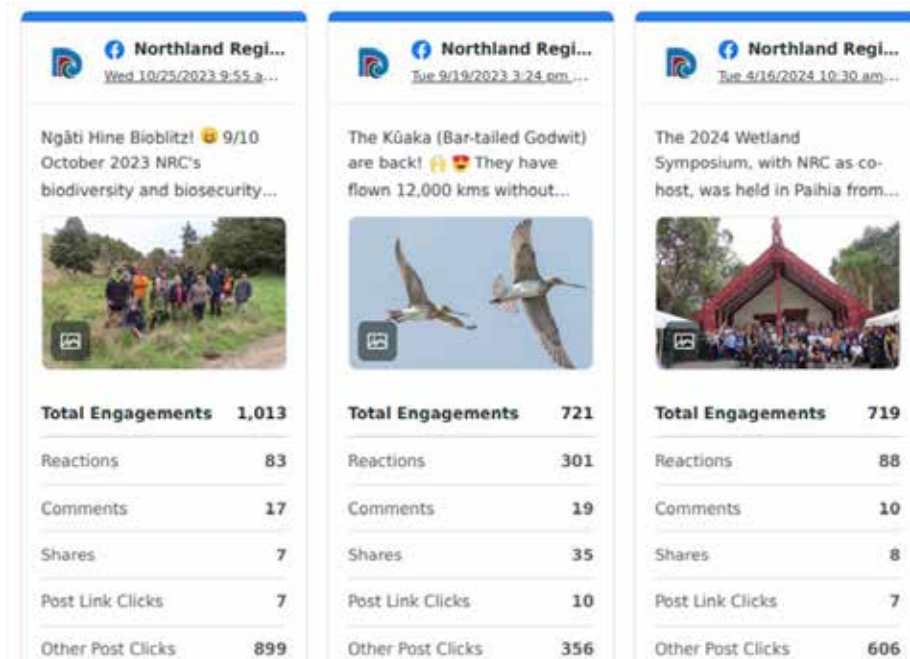
We aim to promote the plight of Northland’s biodiversity, and how important it is to look after our natural world. We let the community know what the Biodiversity team is achieving, as well as how we can support the community’s efforts to look after our environment.

The Biodiversity team connects with the community via the council’s Facebook, LinkedIn and Instagram accounts, website, and media releases. Social media biodiversity-related content continues to increase from 12 to 39 posts in the last year. The traditional media landscape is changing and with closures of local newspapers next year and national tv news broadcasts shrinking, this will impact future coverage through traditional media releases.

Target	Result	Details
<p>Community Engagement – social media Total number of social media interactions is maintained or greater than the previous year (12 in 2022-23).</p>	Achieved	Our social media posts increased by 69% on the previous financial year and covered a wide range of topics, reflecting the broad scope of the Biodiversity team’s work and our commitment to outreach improvement.

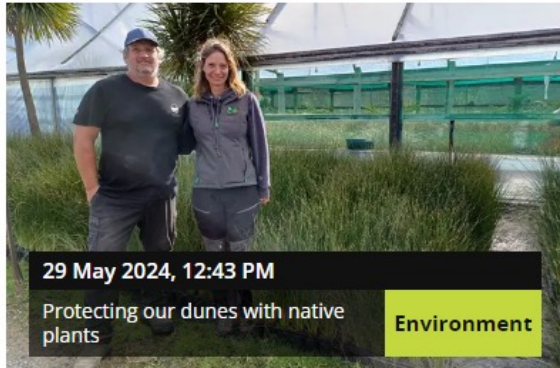
Our content successfully achieved above industry standard (between 1-5%) with a 6.8% engagement rate. Content focused on our communities doing the mahi and profiling special species in Te Taitokerau, such as kūaka (bar-tailed godwit), piharau (lamprey), and matuku- hūrepo (Australasian bittern).

Video content featuring kaimahi (staff) performed best with groups such as Waimate Northland Landcare. This content has potential to elevate employee advocacy with several NRC kaimahi (including Group Managers), engaging with the content.



Top three social media posts: Ngāti Hine Bioblitz, Return of the Kūaka, and Wetland symposium wrap up

A total of eight 'Our Northland' eNewsletter stories were released showcasing our staff and their work in the community, highlighting threatened species and ways to protect our biodiversity and ecosystems were released on the Northland Regional Council website. Seven of these related to CoastCare and the coastal environment.



Two bi-annual CoastCare eNewsletters were distributed:

- 14/12/2023 - CoastCare Northland | Issue 33
- 12/04/2024 - CoastCare Northland | Issue 34

The Biodiversity team also contributed to the Land Management team's Hills to Harbour Newsletter.

Biodiversity Web Content

In 2022 the team, supported by Community Engagement, released a new web page; "Threatened Species" <https://www.nrc.govt.nz/environment/land/biodiversity/threatened-species/>

In 2023-24 several more species were added to this page, including *Trithuria inconspicua* and shortjaw kokopu *Galaxias postvectis*. Some species have a dedicated online Encounter Form, to enable the community to report sightings of matuku-hūrepo (Australasian bittern), pekapeka (bats) and kākahi (freshwater mussels). This means a QR code can be included on relevant signage to encourage interaction from the community. The matuku Encounter Form has been particularly successful, with 109 sightings reported to the team during the year. The team is working with Community Engagement and GIS to refine the reporting forms, enabling pin drop map reporting, which would lead to an improved data resource.

Updates were made to the CoastCare area of the NRC website, <https://www.nrc.govt.nz/coastcare> to make it more user-friendly. The area contains information on CoastCare, groups, dune restoration, dune function and links to the CoastCare newsletters and other publications.



Community Partnerships

The Biodiversity team raises community awareness and understanding of biodiversity values and the threats posed to Northland's biodiversity and encourages community action through advice and support. We support dune restoration, wetland fencing and terrestrial projects through Council's Environment Fund (EFund), as well as the control of Canada geese *Branta canadensis*, which impact water quality in dune lakes.

Photoblique

Photoblique is a software that displays high quality, oblique aerial images that users can annotate with text and shapes, as well as other useful functions. Every year the number of users and downloads increases. The Photoblique contract is managed by the Biodiversity team for all NRC users. Over the 2022/23 year, 68 users of Photoblique (up from 57 the previous year) had requested 14,124 aerial images. The Biodiversity team generated 10.4% of these image views with 25 users in Regulatory Services generating 52%. Photoblique has proven extremely useful for outputs like determining the location of fence lines, viewing the best access to sites, mapping and tracking changes in vegetation, and determining wetlands.

Goal: All public requests to the biodiversity team are logged in IRIS (partially achieved and improving)

The Biodiversity team logged 78 requests in IRIS from the public for information, advice, or assistance this financial year. Most of these (57) were regarding the coastal environment, 13 related to wetlands and eight were in relation to terrestrial, planting or riparian advice. We receive identification requests on a weekly basis usually numbering several per month. Coastal/CoastCare enquiries included coastal erosion, requests for plants for new planting projects, requests for support from schools, requests for clarification of rules around vehicles on beaches and reports of weeds and pests in dune areas.

While we improved on capturing request information in IRIS (council database used to log enquiries) this year, we are still under reporting the full extent of our team's effort in this space.

The Biodiversity team provides plant identification services to the public and other teams via specimens or photographs sent in by email or social media, in-house team training and public education events and site visits.

It is important that team members are capable and qualified to undertake their work programmes. Staff need technical training to support specific project work as well as ensuring qualifications are kept up to date and skills developed as technology and projects change.

Individual team members completed training courses which contributed to individual career development and their ability to undertake varied roles:



Wandering percher dragonfly (*Diplacodes bipunctata*) at Lake Karaka, Poutū

- Field-based training: Ministry for the Environment wetland delineation workshop, NRC wetland training series, freshwater invertebrate sampling and monitoring workshop, GrowSafe standard certificate, Practical field botany (University of Canterbury), NIWA standardised electric fishing for lamprey.
- Skills, including courses on resilience, meaningful meetings, communication & assertiveness.
- Communication and engagement training: media training
- Health and safety training: comprehensive and outdoor first aid, four-wheel drive, trailer training, psychological safety, mental health 101, stress management.
- Te Ao Māori: Understanding Te Tiriti o Waitangi (online workshop), Te Whāriki Level 1 and 2, gathering at the gate (online Tiriti course) and regular kotahitanga training
- Technical skills: IRIS, ArcGIS, KiEco data management, Photoblique, kauri protection, regional species conservation assessment workshop, Manaaki Whenua Landcare Research - more birds in the bush workshop, Maritime NZ oiled wildlife response biennial re-fresher training and a regional oil spill response desk-based exercise.



National training for wetland experts in Waikato using Ministry for the Environment wetland delineation tools

4 Takutai Coastal



Summer interns and Science team member dune monitoring at Puheke Beach.

Northland has a wide diversity of coastal ecosystems, including estuaries and open coast dunes. A large proportion of original dune land has been converted to forestry and pasture. Remaining natural dunes are under increasing threat from introduced pests and weeds, and from direct human impacts such as development and vehicle damage. Coastal ecosystems like sand dunes and saltmarsh provide an important buffer from natural hazards and impacts of climate change such as sea-level rise. They are threatened by coastal squeeze, when infrastructure and buildings prevent dune migration inland.

The CoastCare Te Taitokerau programme is run from within the Biodiversity team and supports local communities to protect and restore their coastal environments, with restoration work to date focussed on dunes and beaches. This is achieved through partnerships with community, iwi/hapū, district councils and DOC.

Dune restoration works

CoastCare groups and projects continue to be supported to achieve protection and restoration of dune systems across Northland, with 23 sites actively managed with support from the CoastCare programme. A total of 14,672 plants were planted at 17 sites in the 2023-24 financial year. Other support included restoration advice, organising and attending working bees and planting days, seed collection and weed control.

Control of pest plants is crucial to successful dune restoration and ongoing maintenance is required. Fore-dune plants in particular are very intolerant of exotic species. We are seeing an increasing variety of exotic species spreading into our dune areas. Several working bees focussing on weed control were held with community, iwi and schools at sites including Ngunguru, Matapōuri, Glinks Gully, Ruakākā, and Ocean Beach. Contractors were paid to assist groups with weed control at several sites.

Animal pest control is undertaken by many CoastCare groups. Rabbit and rodent control is important for plant health as many dune plants, such as pīngao (*Ficinia spiralis*) are very susceptible to rabbit browsing and rodents eating seeds. With help from the NRC Biosecurity team, we support groups carrying out this work with advice, traps and poison.

One of the sites we have been working this year is Ngunguru. We have been working with Ngunguru School, Ngāti Taka and Dunescape on restoration of the school dunes. Several weeding working bees were held with the school, Special Weed Assistance Tutukaka (SWAT) and volunteers from the community and the New Zealand Airforce.



Ngunguru School students removing exotic iceplant from dunes near the school



NZ Airforce personnel helping remove weeds from the dunes near Ngunguru School as part of their community service work

Coastal education and advocacy

Education and advocacy are an integral part of the CoastCare programme since most of the work is undertaken by volunteers, kaitiaki and hapū, with a large involvement from schools. The aim is to reduce damage to coastal ecosystems and increase involvement in nature-based dune protection. CoastCare staff attended 29 events over the year. Events included planting days, weeding working bees, collaborative training workshops, beach clean-ups, education days with schools, public advocacy events and dune monitoring workshops.

Coastal Biodiversity staff have ongoing involvement with inter-agency initiatives aimed at reducing the environmental impact of vehicles on beaches and

dunes. This has included participating in the working groups at Ripiro and Bream Bay and supporting the Kaitiaki o Tokerau programme in the Far North. They provided advice on the implementation of the vehicle exclusion areas in the new Regional Plan and the development of multi-agency signage. Advocacy has included collaborative events, such as the Labour Weekend Ripiro Beach Muster, organised by Kaipara District Council (KDC) and involving Police, Department of Conservation (DOC), NRC, Ministry for Primary Industries (MPI), iwi and community groups.

Advice has been provided to other teams, agencies and the public on topics including coastal restoration and nature-based solutions to coastal erosion.



Police, Department of Conservation (DOC), NRC staff, kaitiaki and community volunteers at Baylys Beach for the Labour Weekend 'Muster' organised by Kaipara District Council to raise awareness of issues caused by inappropriate beach driving and to encourage better driving behaviour on Ripiro Beach. The event also included information stand at Glinks Gully, a beach user survey, and agency patrols up and down the beach.

Partnerships

CoastCare projects involve partnerships with iwi and hapū around the coast of Te Taitokerau and is integral to our work.

One of the groups we have been working with at several sites is Aki Tai Here. A collaborative weed day they helped organise was held at Paradise Shores, Ruakākā. 7,200m² of invasive coastal wattle (*Acacia sophorae*) was drilled and filled. Wattle spreads very quickly and over-stabilises the duneland, taking over from native species and creating an inhospitable 'monoculture'. The purpose of the day was skill and knowledge sharing. Aki Tai Here staff demonstrated best-practice weed control methods and Patuharakeke te taio staff shared knowledge of the cultural significance of the dune area, known as Tupehau.

Another collaborative working bee organised by Aki Tai Here and Bream Head Trust was held at Ocean Beach. The team removed moth plant (*Araujia hortorum*) seed pods from a heavily infested hillside. Nearly 20 rubbish sacks full of pods were removed over the course of 4 hours. Moth plant seed pods split open when mature and contain up to 1,000 seeds which are dispersed by air. These efforts will greatly decrease the number of available seeds, reducing the risk of infestation to our taiao and offshore islands.



Volunteers and staff from Bream Bay Coastal Care Trust, Patuhareke te taio, Aki Tai Here, DOC and NRC CoastCare enjoying a break from drill and fill of invasive wattle in the Paradise Shores area, Ruakākā.



Flowering native grass, prickly couch (*Zoysia minima*) Nationally At Risk - Declining, crowned by kōwhangatara (*Spinifex sericeous*) on the foredune at Wharewa Bay, south of Ngunguru.

Dune Health Monitoring

Over summer 2023-2024 dune monitoring, including vegetation transects, and 5-minute bird counts, were undertaken by staff and interns from the Biodiversity and Natural Resources Science teams with local kaitiaki at 12 sites with the data made available publicly. The information gained through monitoring informs management of the dunes and helps improve understanding of dune systems within hapū, volunteer groups and the wider community.

Dune monitoring provides a record of vegetation cover, provides a record of vegetation cover, including the proportion of native and exotic plant cover. Vegetation transects (survey lines) are measured to give a snapshot of dune health and are used alongside drone imagery and dune profile data to monitor the outcome of restoration work, compare managed and unmanaged sites and track recovery from storm events. Data was uploaded to the Coastal Restoration Trust's monitoring website: <https://monitoring.coastalrestorationtrust.org.nz>

Over the 2023-2024 financial year, the Biodiversity and Natural Resources Science teams continued to work with Patuharakeke Te Iwi Trust Board on a pilot study in Bream Bay to monitor dune fauna. This pilot study is complete and Patuharakeke is keen to continue the monitoring in the Bream Bay area. We hope to incorporate fauna monitoring into the dune monitoring programme at other sites around the region, where there is support for this from hapū/iwi.

A permit was obtained from the Department of Conservation to undertake this work as it was required for handling native fauna. If fauna monitoring is undertaken at other sites new permits will need to be applied for.



Kaitiaki at Taipa learning dune vegetation monitoring techniques

CASE STUDY

Mātihetihe dune restoration project

We have been working with Mātihetihe Marae since 2020 to restore the dunes which provide vital protection to the marae. The dunes are also culturally significant and the marae and kura are named after the dune plant tihetihe (*Spinifex sericeus*) which covers the dunes. In the summer the seedheads, or 'tumbleweeds' blow around the dunes and beaches and their pale colour led to the name Mā (white) tihetihe.

The dunes in front of the marae had been badly damaged by vehicles and the marae made the decision to fence the dunes off and work to restore them, as well as educating the community on the importance of the dunes. An Environment Fund grant was given to cover the cost of fencing.

Several planting days have been held and CoastCare signage designed and made. Te Kura o Mātihetihe have been involved with the project from the start.

The fenced area has been building as the plants spread and grow and the 'bow' is gradually reverting to a natural dune shape. The marae continues to maintain the fence and plant each winter and are planning to gradually replace invasive marram grass (*Calamagrostis arenaria*) with the native tihetihe, further improving the health and natural character of the dune system.



Left: Planting day with Te Kura o Mātihetihe and Mātihetihe Marae in 2020, with newly installed fence in background Bottom left: Tamariki from Te Kura o Mātihetihe and kaitiaki from Mātihetihe Marae planting dunes near the marae in September 2023 Below: Tihetihe (*spinifex*) spreading out of fenced area and building the dune



5 Wai Māori Freshwater



a. Ngā Roto | Lakes

Freshwater Improvement Fund Dune Lakes Project

Pest plant control

The Freshwater Improvement Fund Dune Lakes Project aimed to control or eradicate invasive plant and fish species threatening biodiversity from at least 14 lakes. This goal was achieved with invasive plants *Lagarosiphon major*, hornwort (*Ceratophyllum demersum*), and *Egeria densa* controlled in six lakes, pest fish reduced in six lakes, and grass carp (*Ctenopharyngodon idella*) reduced in three lakes making 15 lakes in total.

The FIF dune lake project asked for an extension to the project to continue hornwort and egeria control in several waterbodies, as we aim to achieve eradication of these weeds. Below is a summary of the pest plant control undertaken since 2020.

Dune Lake Pest Plant Control Summary	Control Dates				
	2020	2021	2022	2023	2024
Ngatu	7/09/2020	No lagarosiphon seen since 2020 during annual surveys.			
Tutaki		11/08/2021	18/11/2021	30/03/2022	7/03/2023
Egg		8/11/2021	30/03/2022	7/03/2023	No hornwort seen during survey Jan 2024
Mt Camel North		15/11/2021	29/03/2022	24/01/2023	23/03/2023
Karaka			23/01/2023	7/03/2023	15/03/2023
Rotokawau (Poutō)			12/12/2022		
Mt Camel South outlet		Could not control as lake outlet was flowing to sea. Treated 21/2/ and 4/4/2024.			21/02/2024
Tutaki Southern Pond			30/03/2022		18/04/2024

Lagarosiphon Aquathol air boat application
Hornwort Reglone kayak application
Key Hornwort Aquathol aerial application
Hornwort Aquathol kayak application
Hornwort Aquathol drone application
Egeria Handweeding by divers

- Lagarosiphon has not been seen in Lake Ngatu since the control took place in 2020. Lake Ngatu surveys will continue until 2025 to see if we have eradicated the weed.
- Hornwort is at undetectable levels in Lake Egg. We will keep surveying the lake for five years to see if we have eradicated this weed. If more hornwort is found, we will control it again.
- Hornwort control is down to 1% of its original extent in Lakes Tutaki, Tutaki Southern Pond, Karaka, Mt Camel North and Mt Camel South outlet. Further control will be undertaken in the summer of 2024/2025 by NRC.
- Egeria has been significantly reduced in Rotokawau following control in May 2024. An estimate 255 kgs of egeria was removed from Rotokawau with three contract divers and two NRC staff over two and a half days. A full reconnaissance survey will be done in the next financial year to assess the extent of remaining egeria.



Egeria densa weeding - Rotokawau



Drone applying Aquathol K to control hornwort (*C. demersum*) at Lake Tutaki

Māori partnerships

The Freshwater Improvement Fund Dune Lakes Project aimed to develop partnerships to support six iwi with their own dune lake management. NRC held hui with each iwi during the project extension to find out how they would like NRC to support them to achieve rangatiratanga over the roto (lakes) in their rohe. Actions we have undertaken during the project extension include:

- Hui with Ngāti Kuri, Te Aupōuri, Te Rarawa, Ngāi Takoto, Te Roroa and Te Uri O Hau iwi to determine their priorities and how NRC can support their aspirations for improved lake health
- Grass carp removal from Wai Te Huahua | Lake Heather and Rotootuuru | Swan.
- Visit to assess gypsy wort at Te Ketekete and work out joint control approach with Ngāti Kuri.
- Attendance in person and at an online hui to discuss options for Lake Wahakari with Te Aupōuri representatives.
- Signage produced and installed for latest hornwort find at Lake Waikanae in the far north.
- Established Taharoa Domain Operational Working Group, which includes iwi representation from Te Roroa and Te Kūihi.
- Worked with Te Roroa to install Check Clean Dry station at Lake Taharoa over summer to check all watercraft for gold clam.
- Continuous monitoring buoys installed at Lakes Taharoa and Ngatu with mana whenua permission.
- Ongoing support from Kaitiaki at Lakes Tutaki and Karaka hornwort control and monitoring visits.
- Taharoa submerged vegetation survey with divers and kaitiaki
- Launch of Te Ao Māori ika resource for tamariki.
- Lake monitoring kits gifted to iwi to support their own lake health monitoring aspirations.



Joint project with Te Roroa iwi, Kaipara District Council and NRC running a cleaning station at Lake Taharoa over summer to reduce the chance of gold clam reaching the Kai Iwi Lakes

Lake ecological surveys and monitoring

The Biodiversity team has conducted annual ecological surveys and monitoring of lakes since 2001. Approximately 100 lakes are monitored every 5 years on a rotating basis. This programme complements regular lake water quality monitoring by NRC of 15 lakes and aligns with the National Policy Statement for Freshwater 2020.

Field assessments involve landowners, iwi representatives and a team of expert divers and botanists assessing submerged plants in lakes, endangered species and marginal wetland vegetation.

Lake report cards are produced after each survey, identifying values, threats, and management recommendations and include LakeSPI measures which assesses submerged plant health in lakes.

In May 2024, ten lakes were surveyed, including Lake Ngatu, where *Lagarosiphon* was controlled. No *Lagarosiphon* was found. Unfortunately, the pest plant hornwort was discovered in a Far North lake which was being monitored for the first time, so the team is working with the lake owners on a control plan.

Lake ecological surveys and monitoring

Annual surveys are conducted in four public high-value lakes at high-risk areas (such as public entry points) to search for submerged aquatic weeds like hornwort and oxygen weeds using commercial divers and NRC snorkelers. Weed surveillance is part of the lake monitoring programme and has led to successful weed eradication efforts using grass carp or herbicide. Detecting incursions early is crucial for achieving eradication success.

The Check, Clean, Dry program, funded by the Ministry for Primary Industries (MPI), through the Biosecurity team complements the Biodiversity team's pest surveillance and ecological survey work, aiming to prevent the spread of freshwater pests between waterways.



Four of the worst aquatic weeds searched for in dune lakes as part of annual weed surveillance including hornwort and three oxygen weeds.

CASE STUDY

Pawarenga ika (fish) resource launch

Many of our freshwater fish species are under threat and at risk. To help protect these species throughout the region, we developed a community and school education resource to help with identifying these taonga species. These ika identification cards have a photo of the fish, identification features, and ruler scale for the verage length fish can grow to. The cards are in te reo Māori and English and can be printed onto waterproof card and taken into the field. The te reo Māori set is presented through a te ao Māori lens and contains mātauranga Māori, gifted by tangata whenua.

The launch was hosted by Te Kura ā-Iwi-o Pawarenga

and supported by Te Aho Tū Roa. Four kura attended from the Hokianga and Whangape areas. Sets were printed and gifted to iwi/hapu and education groups near our lakes and are now available on the NRC website <https://www.nrc.govt.nz/environment/water/lakes/>

Work has now begun on a second set for Northland river and stream species with a plan to launch these on the website by the end of 2024.



Launch of Te Ao Māori ika (fish) identification cards at Rotokākahi River

b. Ngā Repo | Wetlands

Historically Northland's wetlands covered around 453,251 hectares (ha), 35%, of the nearly 1.25 million hectares of land in the region. Freshwater wetlands in Northland have been significantly reduced, mainly by draining and land development, and now only cover an area of 42,325 ha. Wetlands greater than 500m² in size cover ~3.3% of Northland's land area with the majority in the Far North (18%) and less than 4% south of Kaitiaki.^{3 4}

Around 75% of our wetlands are smaller than 10 ha and only three are larger than 500 ha. Many of the remaining wetlands are degraded, and drainage, pests, weeds, fire and climate change remain their biggest threats. This loss of wetland area as well as degradation is a crisis for our wetlands as well as the rare native wetland plants and animals that depend on them, such as the wetland specialists, Australasian bittern (*Botaurus poiciloptilus*) and Northland mudfish (*Neochanna heleioides*).

The Biodiversity team provides advice on wetland management and restoration to private landowners, iwi/hapū and community groups. Biodiversity staff coordinate wetland work across council and provides expert advice to the Compliance, Consent, Land Management and Policy and Planning teams. Biodiversity staff continued to support the Planning and Policy team's staff expert group for developing the freshwater plan change that is required to meet the requirements of the National Policy Statement for Freshwater Management (NPS-FM).

Internal wetland advice

During 2023-2024, biodiversity staff assisted Compliance, Land Management and Rivers staff with site visits and advice on multiple wetland queries. This included visiting and providing advice to the landowner of part of the sixth highest ranked Top Wetland (Maitahi), determining the presence of a natural inland wetland next to a dam being decommissioned in the Far North, and for river improvement projects in the Kawakawa catchments.

Biodiversity staff continued their involvement in the ongoing enforcement evidence for a prosecution. Biodiversity staff provided advice to Consents for the Meridian Ruakākā Energy Park solar farm application and the proposed Oakura sports field development plan.

Landowner site visits and advice

Biodiversity staff carry out field visits and surveys of wetlands to provide advice to mana whenua and landowners on looking after their wetlands. Visits this year ranged from north of Kerikeri, south to Hikurangi repo with QEII and Takahiwai on the east coast with Patuharakeke, and to Kapehu Marae near Ruawai. Advice was provided for a further ten wetland restoration, planting and fauna enquiries.

Technical advice was provided for mana whenua, council and other organisation-wide collaborative projects, including Waipoua Rākau Rangatira kauri boardwalk refresh with Te Roroa and Department of Conservation (DOC), Hikurangi repo (Ōtonga and Ōtaikarangi) revegetation scoping project with Ngā Kaitiaki o Ngā Wai Māori (NKO NW) and Whangārei District Council consultants, Lake Ngatu nutrient modelling with NIWA, and the Ocean Beach Recreation Reserve wetland with DOC.

³ Clarkson B R, Price R J. 2022: A framework for monitoring Northland wetlands. Prepared for Northland Regional Council by Manaaki Whenua Landcare Research. Envirolink Grant: 2205-NLRC228

⁴ MacDonald A. 2024: Development of a wetland mapping tool. Report to Northland Regional by Biospatial Ltd. Council.



Undertaking wetland delineation near Maitahi Wetland Scientific Reserve



A sun orchid (*thelymitra pulchella*)



Ocean Beach Wetland



Hikurangi repo stick insect

Wetland training

The first Wetland Training Series was designed and delivered by the Biodiversity team this year in order to deliver the wetland identification requirements of new freshwater policy. Theoretical, lab and field components were tailored to the needs of several teams including Land Management, Compliance, Biodiversity and Kaipara Moana Remediation staff. Participants learnt to identify the main types of wetlands in Te Tai Tokerau, the key species that live in them, the national methods for delineating wetlands and the rules as they apply to wetlands in Northland. This was a first for regional councils in New Zealand and provides a foundation for developing the mōhio (understanding) and skills that many of us require for our mahi pertaining to wetlands at NRC.



NRC staff installing wetland delineation transects and plots in Hikurangi repo



Students learning to differentiate between wetland plant groups in the laboratory at Northtec

A wetland plant identification workshop was also delivered at Kāretu as part of a Wetland Restoration Wānanga that was held at Kāretu Marae led by Whitebait Connection and Ngāti Manu.



Wetland plant identification before putting in a wetland delineation plot at a farmer's wetland in Haruru.



Ngāti Manu kaitiaki, Whitebait Connection & Biodiversity team members at the wetland plant identification workshop in Kāretu

Wetland monitoring

Wetland Condition Index (WCI) monitoring continued and showed that ecological condition is improving in most of these wetlands. This encouraging progress is due to several factors, including the hard work of landowners and installation of fencing via NRCs Environment Fund.

The WCI monitoring began in 2011, and 32 wetlands have been monitored since then. Nine wetlands were monitored in 2023, completing the fourth monitoring cycle.

In 2022 NRC contracted Manaaki Whenua – Landcare Research and developed a framework for monitoring freshwater wetlands and provide a set of priority monitoring sites representative of Northland's wetlands. This recommends 61 wetlands for monitoring across the region, which includes the 32 wetlands monitored using the Wetland Condition Index (WCI). The framework is now used as the basis for wetland monitoring across Northland.

Wetland mapping

NRC's Policy and Planning team and Kaipara Moana Remediation (KMR) Programme contracted the development of a wetland mapping tool and associated GIS layers.

The wetland mapping tool predicts the location and extent of wetlands across the region using a combination of data sets and machine learning – the maps generated by the tool are therefore 'indicative' until verified. The wetland mapping tool and associated maps are currently under internal review. Biodiversity staff contributed to the project with specialist advice and will assist in the review.

The tool will form the basis of a wetland inventory and associated monitoring plan as required by the National Policy Statement for Freshwater Management 2020 (NPS-FM). Public release of the GIS maps generated by the tool is anticipated following refinements and preparation of a communication plan outlining the purpose and uses of the maps.

Matuku-hūrepo | Australasian bittern records and monitoring

A web page to capture the public's matuku-hūrepo/Australasian bittern (*poiciloptilus*), sightings has proven highly successful, with a total of 103 records recorded in the 2023-2024 financial year (up from 16 last year). This is an exciting opportunity to involve the public in reporting matuku-hūrepo sightings and to promote the conservation of these birds.

We worked regionally with Kiwi Coast, DOC, and Queen Elizabeth II National Trust to ensure Matuku-hūrepo are monitored in a consistent manner across the region during the 2023/24 spring and summer field season. Ten sites in the Tinopai and Paparoa areas were monitored during the 2023-2024 financial year, as well as two sites in Maromaku and seven sites near Kawakawa.

Matuku-hūrepo are monitored using acoustic recording devices, which are left in the field to record the distinctive boom that the male matuku-hūrepo makes during the breeding season (late spring to early summer). The audio files are then manually analysed by listening and visual searches of the sonograph on computer software.

Male matuku-hūrepo were monitored acoustically from September to December and heard booming at 8 of 19 sites. Booms peaked in November.

As a result of our regional partnership, monitoring and community response to our website reporting form, 16 'slow for bittern' signs were installed at eight sites in Northland. The signs were installed at Maitahi (in partnership with DOC, after two matuku-hūrepo were killed by vehicles in short succession in this area), Poutō as well as Ruakākā and Mangawhai in partnership with the Shorebirds Conservation Trust.

CASE STUDY

National Wetland Symposium

The National Wetland Trust was established in 1999 to increase the appreciation of wetlands and their values by all New Zealanders. Every two years the National Wetland Trust organises a gathering of community groups, landowners, iwi/hapū, scientists, wetland managers and students who are interested in sharing and learning about wetland restoration. One staff member is a National Wetlands Trustee.

Biodiversity staff were thrilled to be co-hosting the three-day biennial National Wetland Trust Symposium in Te Taitokerau, at the Copthorne Hotel, Paihia, on 10-12 April 2024 for around 220 delegates from all over New Zealand. Biodiversity and Māori Engagement team staff were on the organising committee, with one of the Biodiversity staff chairing the committee.

The symposium opened with a powhiri on the Waitangi Treaty Grounds at Te Whare Runanga and continued with presentations from a wide range of enthusiasts and professionals, practical training opportunities and soapbox sessions. The symposium concluded with a final day of field trips to dune lakes and gumlands in the Far North, led by NRC Biodiversity staff, and Hikurangi repo led by Living Water and Ngā Kaitiaki O Nga Wai Māori. The field trips were a fantastic opportunity to showcase some of Northland's special places and hear of the mahi carried out by mana whenua, agencies, volunteers and others who look after these taonga. The symposium was a great opportunity for connecting landowners, kaitiaki, and scientists and to showcase local projects, learnings, people, and wetlands.



Symposium delegates in front of Te Whare Runanga following the powhiri.



*Symposium organising committee.
Photo credit: Andrew Kirk*



*Symposium Far North field trip - Lake Ohia with
burnt area in foreground.*

*Below: A Land Management team member
presents at the Hikurangi Repo field trip.*



c. Ngā Awa | Streams and rivers

Biodiversity staff assisted the Compliance team by completing barrier assessments using the Fish Passage Assessment Tool (FPAT) developed by NIWA. Many native fish require access up and downstream to complete their lifecycles. Barriers like culverts, weirs, dams, and sometimes bridges, can hinder fish passage by changing water flows, altering natural channels, or present vertical barriers that some fish like īnanga (*Galaxias maculatus*) cannot climb.

Biodiversity staff attended quarterly hui (meetings) with district councils, DOC, NZTA, KiwiRail, and other stakeholders to ensure collaboration is achieved in writing a Northland Fish Passage Action Plan with Boffa Miskell and NIWA. Funding for fish passage work came from the Ministry for the Environment, linked to the National Policy Statement for Freshwater Management, and is overseen by the Compliance team.

Fish survey training – Fish Passage

As part of the fish passage partnership, Biodiversity staff have been training Compliance staff in fish survey methods. This is an important component of fish barrier work as we need to understand which species are present upstream, to determine how

much of a barrier the structure is, and downstream, to determine which species are possibly trying to penetrate upstream past the barrier.

Fish survey training – Piharau / Lamprey

Piharau/lamprey (*australis*) (Threatened – Nationally Vulnerable) are an ancient and primitive fish spending several years in freshwater before metamorphosing (changing colour and form) and migrating to sea, returning to freshwater to reproduce at the end of their life cycle. Whilst at sea they are parasitic on other fish. Piharau are New Zealand's most ancient freshwater fish having been around for 500 million years. They are jawless, have no organs and shed DNA they no longer use as they move through their life cycle.

Standard fishing techniques are ineffective to monitor this species as they bury themselves deep in sediment. NIWA recently developed a new method of electric fishing for this species in their freshwater stage as larvae when they are up to 100mm in length. A member of the Biodiversity team joined Biosecurity, Water Quality and Fish Passage teams to learn this new fishing technique. We will use this method alongside other freshwater work to understand where this species can be found in Te Taitokerau.



A fish barrier structure at McLeod Bay. Īnanga were found in the concrete pool (centre of image), but not upstream of the weir (centre left of image).



Biodiversity staff weighing juvenile piharau.



Piharau at 3-4 years change colour from grey to silver-blue with bright eyes.



Electric fishing for lamprey in a Waikato river during training.

Waimāori invertebrate survey training

During the 2022 Tāika Biodiversity Assessment a mayfly (*Zephlebia aff. Pirongia*), classified as Threatened - Nationally Critical, was detected in eDNA surveys. Following this discovery a physical survey of both juveniles and adult freshwater invertebrates was completed to confirm the mayfly's presence. The expertise and the methods used tripled our survey results raising the number of freshwater invertebrate taxa from 19 to a total of 61. The survey identified a total of 11 species of conservation interest, including two species new to western science.

This led to the design and delivery of a workshop for the community by NRC and Pohe Environmental to share these techniques, explain the results and begin a kōrero about naming the two previously unrecognised species. The workshop was delivered at Tāika forest and NorthTec with Ngā Kaitikai o Ngā Wai Māori and Ngāti Kahu o Torongāre.



Learning how to set up light traps with NorthTec, Ngā Kaitiaki o Ngā Wai Māori and Ngāti Kahu o Torongāre in Tāika forest



Using the microscopes at NorthTec to get a close up of freshwater invertebrates caught in the light traps

Freshwater education

Biodiversity staff worked with BestStart Pipiwai Road, a daycare for ages 0-4 year olds, to deliver freshwater education as part of their Enviroschools journey. Kaiako (teachers) reached out to NRC Biodiversity staff as they were keen to teach the tamariki (children) from a young age the importance of looking after our freshwater, in particular, not throwing their rubbish and toys over the fence into their neighbouring awa (stream)!

The visit to BestStart Pipiwai Road included a fish survey where Biodiversity staff set Gee minnow traps in the Waitaua Stream behind the daycare, then retrieved them the following morning to show the tamariki the creatures living in the stream.

Biodiversity staff have partnered with NRC's Enviroschools Facilitator's to deliver biodiversity-related learning opportunities to support BestStart Pipiwai Road's Enviroschools journey.



BestStart Pipiwai Road children watching Biodiversity staff retrieve fish from gee minnow traps, from the Waitaua Stream



Kākahi / freshwater mussel surveys

Kākahi (also known as torewai or kāeo) are native freshwater mussels of cultural significance. Two species are found in Te Taitokerau, *E. menziesii* (At risk - Declining) and *E. aucklandica* (Threatened - National Vulnerable). They are highly efficient filter-feeders, with each mussel able to filter up to a litre of water per hour, and as such are important components of New Zealand's waterways. They are found in a range of freshwater habitats, from streams to lakes.

Their lifecycle is dependent on native fish - for part of their life they are fish parasites. Their average life span is 12-30 years, but under the right conditions they can live as long as 50 or 60 years.

Kākahi face a number of threats including habitat loss, predation by introduced mammals, pollution, and declining fish host populations that are needed to complete their lifecycle.

A NRC group was formed comprising staff from Biodiversity, Monitoring, Policy & Planning, and Land Management, to determine how NRC should monitor these threatened species. It was recommended that partnering with local communities would be the best approach. A reporting form on our website and a Survey123 for staff was created to capture kākahi encounters (similar to our 'bittern encounter form').



Searching for kākahi underwater using a bathyscope



Kākahi in a lakebed, viewed through a bathyscope. Note the near vertical line in the sand above the kākahi that shows its recent movements.

6 Te Mata o Te Whenua

Terrestrial



Kukupaar New Zealand wood pigeon (*Clematis paniculata*) perched in a taiaire (*Beilschmiedia taraira*)



Photo of *Pittosporum cornifolium* flowers taken on a botanical ramble.

Tāika Forest biodiversity assessment

The publication of the Tāika Forest Biodiversity Assessment report in 2022 outlined the forest's high biodiversity values and led to the implementation of management actions which will benefit biodiversity:

- Significant, continued improvement to the bait station network (improved access and several new bait station lines) has been completed by the Biosecurity partnerships team.
- Uncertainties around budgets and ownership reduced the investment in predator control and output monitoring, however this will resume in the next financial year, along with improvements in stoat and cat control, reducing pig numbers and a more effective possum control programme.
- Pest plant removal has been delivered along access ways and road edges to reduce weed incursion to neighbouring properties.
- Pest plant management has begun with Aki Tai Here kaimahi checking roads and forested areas in the Abby Caves Remnant, killing priority weeds and marking larger infestations for later treatment.
- Several fish passage barriers were revisited after cyclone Gabrielle. Staff recommended a reassessment of all barriers.
- A freshwater invertebrate survey workshop was delivered at NorthTec and the Waimahanga stream in Tāika forest, with mana whenua Ngāti Kahu o Torongare and Ngā Kaitiaki o Ngā Wai Māori.
- The first round of the State of the Environment (SOE) fish biodiversity monitoring was completed, with almost identical results to 2022 (56 instead of 55 banded kokopu, two long fin eels and three red fin bullies).
- Department Of Conservation authorisations to handle lizards and bats have been received, however these were late in the survey season and both programmes are now planned for the coming spring/summer.
- A network of 50 five-minute bird count (5MBC) stations have been established along easy access routes. Winter baseline counts have been completed and a core birding team established.

This will enable quality baseline data to be captured for future outcome monitoring of predator control and comparison to other nearby programmes.

- A second acoustic pekapeka (bat) survey was conducted in April which found several new areas of bat activity within Tāika forest, some in close proximity to mature pine. Roughly the same number of passes were observed as in early February 2022, however the area of highest activity was found to be in the upper wetland area in the Abby Caves Remnant, as opposed to the lower wetland pond.
- A lizard spotlighting survey was completed in April 2024 and returned substantially fewer gecko detections per unit effort (1 compared to 10 individuals). This could be due to a change in habitat (spraying of pampas along road edges and growth of kānuka trees), or other environmental conditions such as drought and temperature.

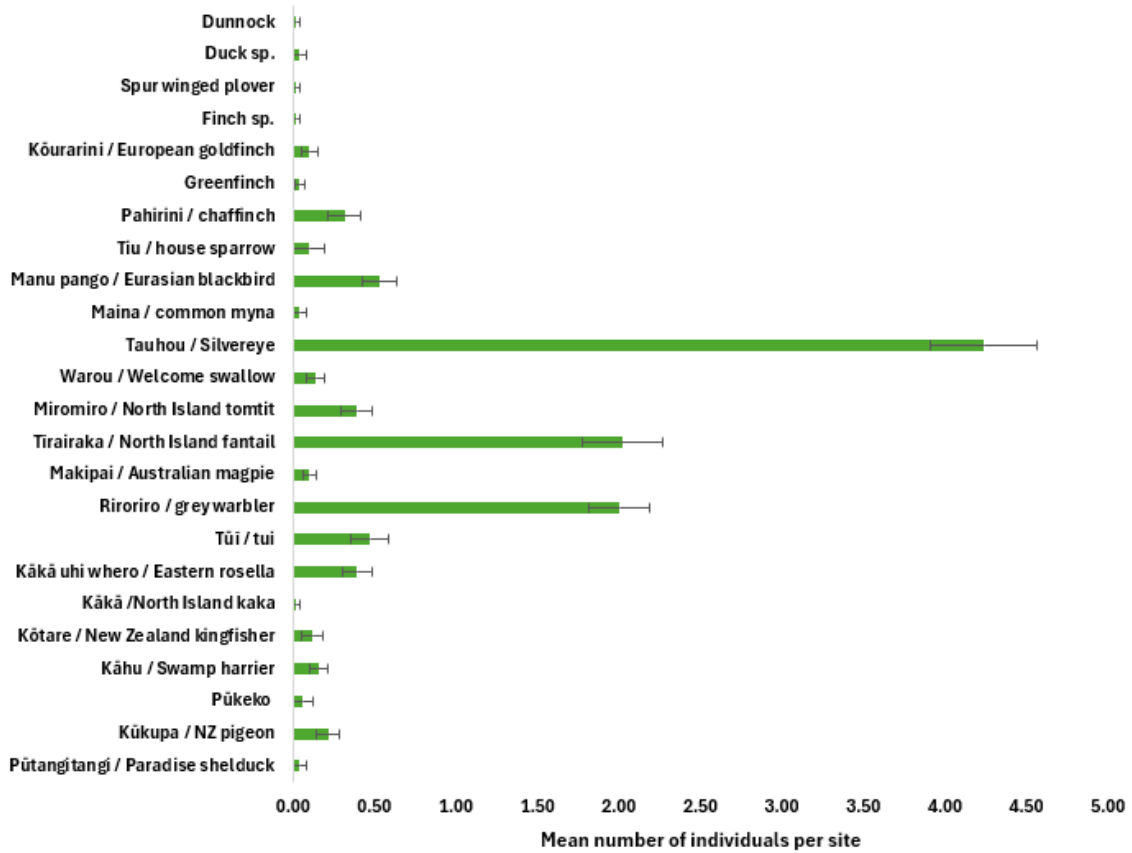
- Issues surrounding fencing of the lower boundary of the forest and river were worked on but not resolved.
- \$72,000 has been allocated to biodiversity management and research in the 2024/25 financial year and a similar sum in each of the next two following years.

This programme of work involved multiple NRC teams including Biodiversity, Biosecurity, PF2050, Land Management and Compliance, as well as Ngāti Kahu o Torongāre.



Areas of the Tāika forest treated and surveyed for pest plants by Aki Tai Here in 2023 / 2024.

Tāika Forest Winter 5MBC 2024



Results of the 2024 Tāika forest winter five minute bird count survey.



Three individual female North Island brown kiwi *Apteryx mantelli* found or released in Tāika forest by Biosecurity staff (Left to right: Fetu mama, Hine, & Rosvall).



BatSearch software pictograph of a long-tailed bat echolocation call in Tāika forest (mama, Hine, & Rosvall).

Botanical Rambles

The Biodiversity team continued to organise social Botanical Rambles, an after-hours opportunity for staff and others to explore the diversity of plants in Te Taitokerau and develop botanical literacy in the company of like-minded people. The rambles support the professional development of NRC staff members and knowledge sharing from some of Northland's best botanists and mana whenua.

During the 2023-2024 year six botanical rambles were held:

- Parihaka fern hunt - focus on ferns
- Coronation Scenic Reserve, Pukenui - focus on the threatened King fern and weeds
- Jack's Bush, Kaikohe - focus on intact old growth forest and landowner advice
- Kaiwaka Mangawhai bush remnants (Worsfold's Farm) - focus on regenerating kauri forest
- Maunga Whakairiora and Ngunguru Sandspit - focus on cultural history, coastal species and regenerating forest
- Fantastic fungi at Ōpua and Paihia - focus on lichen and mushrooms



Checking out ferns on the Parihaka fern hunt with Auckland botanist Maureen Young



Biodiversity team members on the weekend maunga Whakairiora botanical ramble

Pekapeka / Bat

New equipment was trialled, and a second round of acoustic surveying was conducted in Tāika forest. The survey confirmed the presence of the Threatened -nationally critical endemic long-tailed bat *Chalinolobus tuberculatus* and revealed new sites of activity. Finding areas of consistent, high activity will allow future surveys to find roost sites. Pekapeka are most vulnerable in roosts when they have non volant young (unable to fly) and when they are in a state of torpor, which is like hibernation. Identifying roosts will allow us to focus predator control efforts and better protect this colony. A permit to catch and attach transmitters to pekapeka in Tāika forest has been received and the operation is planned for next summer.

Only one sighting was recorded on the NRC pekapeka encounter webpage this year. We believe this highlights the lack of knowledge by the public, small populations and the cryptic nature of the species. It is hoped that with repeated exposure of pekapeka information on our website, social media platforms, and at events like Field Days, more people will become aware of our native bats and get involved in their conservation.

The Biodiversity team has established a Te Taitokerau pekapeka rōpū with the purpose of collaborating and supporting pekapeka mahi and recovery across the region. Several meetings have been held which included DOC staff (national recovery group and regional staff), Pukenui Trust members, ecological consultants, Biodiversity team members, PF2050 and KiwiCoast.

A Biodiversity staff member assisted the Ōmahuta Short-Tailed Bat Project which aims to survey, monitor and protect one of the last mainland populations of *Mystacina tuberculata aupourica* in New Zealand. The population of this short-tailed bat subspecies is estimated to have around 700 individuals left and could become extinct through predation by introduced mammals. Experience and knowledge were gained in operational management, bat catching, handling, attaching transmitters and radio tracking bats to identify roost trees. This will inform future bat work led by the team.



The northern subspecies of the lesser short-tailed bat (*Mystacina tuberculata aupourica*) in Ōmahuta forest

CASE STUDY

Ngāti Hine BioBlitz at Tae Pae Tata

Ten kaimahi from the Ngāti Hine Forestry Trust and neighbouring hapū joined NRC for two days of intensive learning in October 2023 for a Bioblitz.

The aim of a Bioblitz is to record as many species as possible during a specified period, giving a 'snapshot' of biodiversity present at the site at that moment in time. This included five-minute bird counts, acoustic surveys for pekapeka and matuku-hūrepo, as well as fish and plant surveys. General observations of plant disease, pest animal damage, pest plant presence, edge effects and climate change impacts were also made and action was taken to control pest plants at the site. A pest animal workshop was run by NRC Biosecurity and trail cameras were installed on the existing trap network.

A total of 240 species were identified, 74% of which were native. This included two fish, 28 birds, 47 ferns, 103 dicotyledons and conifers, 57 monocotyledons, and 3 lichens or mosses.

Pest plants removed included gorse, wattles, pampas, prickly hakea, willow-leaved hakea and one large wilding pine. Footage of possum antics on the trail cameras resulted in an engaged discussion on pest animal control and options to enhance current efforts. The bioblitz report will be used to inform ongoing decision making on biodiversity management at Tae Pae Tata.



Checking fish traps



Drilling and filling weeds like wilding pines.



Spider orchid

