

## Meeting of the Environment and Integrated Catchments Committee

**Date:** 11 September 2024  
**Time:** 9.00am  
**Venue:** Council Chamber  
 Hawke's Bay Regional Council  
 159 Dalton Street  
 NAPIER

### Agenda

Item	Title	Page
1.	Welcome/Karakia/Housekeeping/Apologies	
2.	Conflict of Interest Declarations	
3.	Confirmation of Minutes of the Environment and Integrated Catchments Committee meeting held on 12 June 2024	
4.	Public Forum	3
<b>Decision Items</b>		
5.	Biosecurity Annual Report 2023-2024 and Operational Plan 2024-2025	7
<b>Information or Performance Monitoring</b>		
6.	Coastal and River Bird Survey findings	11
7.	Our Landscapes – LiDAR partnership project with Manaaki Whenua Landcare Research	19
8.	Air Quality Monitoring update	23
9.	3D Aquifer Mapping project closure – What did we find and how will this information be used?	27
10.	Public Waterways and Ecosystem Restoration Fund Project Report	33
11.	Update on the IRG flood control and drainage programme	37
12.	Update on the North Island Weather Events resilience programme	43



**Hawke's Bay Regional Council**  
**Environment and Integrated Catchments Committee**  
**11 September 2024**

**Subject: Public Forum**

**Reason for report**

1. This item provides the means for the Committee to give members of the public the opportunity to address the Committee on matters within its terms of reference (attached).

**Background**

2. The Hawke's Bay Regional Council's Standing Orders provide for public forums as follows:

**14. Public Forums**

Public forums are a defined period of time, usually at the start of a meeting, which, at the discretion of a meeting, is put aside for the purpose of public input. Public forums are designed to enable members of the public to bring matters to the attention of the local authority.

In the case of a committee or sub-committee, any issue, idea or matter raised in a public forum must also fall within the terms of reference of that meeting.

Requests must be made to the HBRC Governance Team (06 8359200 or [governanceteam@hbrc.govt.nz](mailto:governanceteam@hbrc.govt.nz)) at least one clear day before the meeting; however, this requirement may be waived by the Chairperson.

**14.1 Time limits**

A period of up to 30 minutes, or such longer time as the meeting may determine, will be available for the public forum at each scheduled Regional Council, Corporate & Strategic Committee, Environment & Integrated Catchments Committee and Regional Transport Committee meeting.

Speakers can speak for up to 5 minutes. No more than two speakers can speak on behalf of an organisation during a public forum. Where the number of speakers presenting in the public forum exceeds 6 in total, the Chairperson has discretion to restrict the speaking time permitted for all presenters.

**14.2 Restrictions**

The Chairperson has the discretion to decline to hear a speaker or to terminate a presentation at any time where:

- a speaker is repeating views presented by an earlier speaker at the same public forum
- the speaker is criticising elected members and/or staff
- the speaker is being repetitious, disrespectful or offensive
- the speaker has previously spoken on the same issue
- the matter is subject to legal proceedings
- the matter is subject to a hearing, including the hearing of submissions where the local authority or committee sits in a quasi-judicial capacity.

### **14.3 Questions at public forums**

At the conclusion of the presentation, with the permission of the Chairperson, elected members may ask questions of speakers. Questions are to be confined to obtaining information or clarification on matters raised by a speaker.

### **14.4 No resolutions**

Following the public forum no debate or decisions will be made at the meeting on issues raised during the forum unless related to items already on the agenda.

### **Decision-making process**

3. Staff have assessed the requirements of the Local Government Act 2002 in relation to this item and have concluded that, as this report is for information only, the decision-making provisions do not apply.

### **Recommendation**

That the Environment and Integrated Catchments Committee receives and notes the *Public Forum speakers' verbal presentations*.

### **Authored by:**

**Leeanne Hooper**  
**Team Leader Governance**

### **Approved by:**

**Desiree Cull**  
**Strategy & Governance Manager**

### **Attachment/s**

- 1 [↓](#) Environment & Integrated Catchments Committee Terms of Reference



## Environment and Integrated Catchments Committee Terms of Reference

*Adopted by resolution of Hawke's Bay Regional Council on 16 November 2022*

The purpose of the Environment and Integrated Catchments Committee (EICC) is to consider and recommend to Council:

### 1. Policy

- 1.1 carbon reduction and climate change adaptation and mitigation policies and strategies developed to guide the establishment of work plans
- 1.2 policies with regard to Council responsibilities and involvement in flood protection and drainage
- 1.3 policies with regard to Council's responsibilities for biosecurity, biodiversity and pest management
- 1.4 policies, strategies, and by-laws and compliance and enforcement programs relating to maritime and navigational safety under the Maritime Transport Act.

### 2. Environmental Monitoring and Research

- 2.1 environmental monitoring strategies and research and investigation programmes, including the State of the Environment Reports.
- 2.2 technical reports on the findings of research and investigations into the impact of activities on the receiving environments and recommend to Council the development of new policy frameworks based around such information.

### 3. Implementation

- 3.1 management plans or any similar such documents for the effective implementation of environmental enhancement and improvement programmes of Council.
- 3.2 all other policy implementation issues of Council.
- 3.3 To periodically review the effectiveness of Council's non-regulatory resource management operational work programmes within the ambit of the Committee and make recommendations to Council for any changes.
- 3.4 To assist staff, where appropriate, in identifying a preferred option and/or funding mechanism for Council consideration of biosecurity/ biodiversity initiatives, proposals for new or expansion of existing open spaces and regional parks, and infrastructure asset construction or improvement work; and in promoting the preferred option to the beneficiaries/ community.

### 4. Financial Authority

- 4.1 consideration of possible financial implications of specific initiatives.

## 5. Use of Delegated Powers for the Environment & Integrated Catchments Committee

5.1 This Committee may, without confirmation by the local authority that made the delegations, exercise or perform them in the like manner and with the same effect as the local authority could itself have exercised or performed them, provided that the decision deserves urgency and the decision to make the resolution a decision of Council is carried unanimously.

<b>Members:</b>	<ul style="list-style-type: none"><li>• All Councillors being: Hinewai Ormsby, Will Foley, Neil Kirton, Charles Lambert, Jerf van Beek, Martin Williams, Sophie Siers, Di Roadley, Thompson Hokianga, Jock Mackintosh</li><li>• One appointed member of the Māori Committee, Katarina Kawana</li><li>• One appointed member of the Regional Planning Committee, Michelle Mclroy</li></ul>
<b>Chair:</b>	A member of the Committee as elected by the Council being: councillor Sophie Siers
<b>Deputy Chair:</b>	A member of the Committee as elected by the Council being: councillor Di Roadley
<b>Meeting Frequency:</b>	Quarterly
<b>Staff Executive:</b>	Group Manager Integrated Catchment Management Group Manager Asset Management

**Hawke's Bay Regional Council**  
**Environment and Integrated Catchments Committee**

**11 September 2024**

**Subject: Biosecurity Annual Report 2023-2024 and Operational Plan 2024-2025**

**Reason for report**

1. This item presents the Hawke's Bay Regional Council's *Biosecurity Annual Report* for the 2023-2024 year and *Operational Plan* for the 2024-2025 year for the Committee's consideration and recommendation to the Regional Council.

**Staff recommendations**

2. Staff recommend that the Committee considers this item and its **attachments** to enable making a recommendation to the Regional Council to adopt the Biosecurity Operational Plan for 2024-2025 as required by the Biosecurity Act 1993 (the Act).

**Executive Summary**

3. Pest management is an important part of the sustainable management of natural resources in Hawke's Bay. Hawke's Bay Regional Council (Council) manages risks posed by pests and other organisms through its Biosecurity programme. The Hawke's Bay Regional Pest Management Plan (RPMP) 2018-2038 is the core document behind this and establishes the regulatory basis for pest management in Hawke's Bay. The RPMP was made operative in February 2019.
4. As the management agency, Council is directed by the Act to prepare an Annual Operational Plan (AOP) that sets out how the RPMP is to be implemented. Following the end of each financial year, Council is required to produce an Annual Report (AR), recording progress in implementation of the RPMP via the Operational Plan.

**Background**

5. Regional councils have a mandate under Part 2 of the Act to provide regional leadership in activities that prevent, reduce, or eliminate adverse effects from harmful organisms that are present in their region. Therefore, HBRC has this leadership role in the Hawke's Bay region.
6. The purpose of the RPMP is to provide for the efficient and effective management or eradication of specified harmful organisms in the Hawke's Bay region. It builds on the 2013 Strategy and previous pest management programmes. The purpose of the plan is to:
  - 6.1. minimise the actual or potential adverse or unintended effects associated with those organisms, and
  - 6.2. maximise the effectiveness of individual actions in managing pests through a regionally coordinated approach.
7. Many organisms in the Hawke's Bay region are considered undesirable or a nuisance. The RPMP only addresses pests where voluntary action is insufficient, due to the nature of the pest or the related costs and benefits of individual action or inaction. The Act specifies criteria that must be met to justify such intervention.
8. The RPMP empowers Council to exercise the relevant advisory, service delivery, regulatory and funding provisions available under the Act to deliver the specific objectives identified within the Plan.

## Discussion

9. The RPMP contains 63 pests, comprising of 33 pest plants, 23 pest animals, two marine pests and five horticultural pests.
10. Some of the key outputs during the 2023-2024 financial year were:
  - 10.1. The Biosecurity team visited 2005 properties undertaking weed control or auditing.
  - 10.2. Staff undertook 10 yearly monitoring of Californian green thistle beetle sites in conjunction with Landcare Research across the region with all sites having the beetle present.
  - 10.3. A second exclusion pest plant, Senegal Tea, was detected in the Hawke's Bay region. Senegal tea was detected in the Karamu stream and Te Awa o Mokotuāraro (Clive River). Work is underway to control this pest while a plan for future management is developed.
  - 10.4. One aerial control operation was undertaken to control Alligator weed at Lake Whatumā, Central Hawke's Bay. We estimate a reduction in biomass of about 70 percent but this percentage may change as the plant comes into leaf in the spring and summer period. We have some expectation that some of this biomass will regrow at this time due to the deep root system the plant holds.
  - 10.5. The marine biosecurity surveillance programme detected no marine pest incursions.
  - 10.6. One Notice of Direction was issued due to non-compliance with the Controlled Area Notice for Chilean needle grass.
  - 10.7. A total of 151 active rook nests were treated.
  - 10.8. 16,791 hectares were surveyed and controlled for wilding conifers in Rangitaiki and Napier/Taihape Road areas.
  - 10.9. A total of 550 feral goats were controlled within the Mahia and Maungaharuru feral goat coordinated management areas (CMA).
  - 10.10. 19 enquiries on the management of problem rabbit populations were responded to.
  - 10.11. Staff worked with 16 land occupier/community groups in managing site specific pests at sites of ecological importance.
  - 10.12. Possum monitoring was undertaken across 293, 056 ha (approximately 37% of the PCA area) with the overall trap catch across this area being 2.1%.
11. Although almost all programme objectives were achieved, the following areas of concern were identified:
  - 11.1. 513 possum monitoring lines were above a 4% RTC, resulting in 99 properties failing their monitor (15.5% of properties monitored). Staff are following up with these properties to ensure that appropriate action is being taken to control possum numbers. Staff can and will initiate legal action if the initial education approach does not work.
12. The number of properties with pest plants (primarily Chilean needle grass) continues to grow, resulting in increased pressure on Pest Plant budgets and staff.
13. The recent discovery of Senegal tea in the region puts further pressure on the Biosecurity team in terms of resourcing and budgets to control this pest. Control of this pest will add additional pressure during the peak season of spring/summer, a time when resourcing is already stretched.
14. Pressure needs to continue to be applied to the Alligator weed infestation at Lake Whatumā to continue progression toward eradication.



### Strategic fit

15. Regional pest management sits within a biosecurity framework for the Hawke's Bay region, which includes the RPMP, the Hawke's Bay Biodiversity Strategy and the HBRC Strategic Plan. Neighbouring Regional Pest Management Plans and national legislation, policy and initiatives have also influenced Hawke's Bay's RPMP.
16. The activity that is reported in the Operational Report and Annual Plan support Council's healthy functioning biodiversity in its Strategic Plan and the strategic outcome that agricultural and environmental pests are managed and eradicated through the Regional Pest Management Plan.

### Financial and resource implications

17. Council's Long Term Plan 2018 – 2028 provides the necessary funding, via rates and user charges, for the operational and planning activities associated with pest management. The 2024-2025 expenditure budgets are summarised within the 2024-2025 Operational Plan.

### Decision-making considerations

18. Council and its committees are required to make every decision in accordance with the requirements of the Local Government Act 2002. Staff have assessed the requirements in relation to this item and have concluded:
  - 18.1. The decision does not significantly alter the service provision or affect a strategic asset, nor is it inconsistent with an existing policy or plan
  - 18.2. The use of the special consultative procedure is not prescribed by legislation
  - 18.3. The decision is not significant under the criteria contained in Council's adopted Significance and Engagement Policy
  - 18.4. The persons affected by this decision are all persons in the region with an interest in the region's biosecurity activities and biodiversity outcomes
  - 18.5. Given the nature and significance of the issue to be considered and decided, the Committee can exercise its discretion and make a decision without consulting with the community.

### Recommendations

1. That Environment and Integrated Catchments Committee receives and considers the *Biosecurity Annual Report 2023-2024 and Operational Plan 2024-2025* staff report.
2. The Environment and Integrated Catchments Committee recommends that Hawke's Bay Regional Council:
  - 2.1. Agrees that the decisions to be made are not significant under the criteria contained in Council's adopted Significance and Engagement Policy, and that Council can exercise its discretion and make decisions on this issue without conferring directly with the community or persons likely to have an interest in the decision.
  - 2.2. Adopts the Biosecurity Operational Plan for 2024-2025.

### Authored by:

**Matthew Short**  
**Catchment Management Lead - Biosecurity**

**Mark Mitchell**  
**Principal Advisor Biosecurity Biodiversity**

**Approved by:**

**Iain Maxwell**  
**Group Manager Integrated Catchment**  
**Management**

**Attachment/s**

- |                   |  |  |
|-------------------|--|--|
| <a href="#">1</a> | 2024-2025 Combined Pest Plant and Pest Animal Operational Plan | Under Separate Cover<br><i>online only</i> |
| <a href="#">2</a> | HBRC Biosecurity Annual Report 1 July 2023 - 30 June 2024      | Under Separate Cover<br><i>online only</i> |

**Hawke's Bay Regional Council**  
**Environment and Integrated Catchments Committee**

**11 September 2024**

**Subject: Coastal and River Bird Survey findings**

**Reason for report**

1. This report provides a summary of the results of post-cyclone surveys of indigenous bird distribution and abundance along the Hawke's Bay coastline and Tūtaekurī, Ngaruroro and Tukituki Rivers. An introduction to the coastal survey was brought to the committee in November 2020 and the baseline results were presented in November 2021. Completed reports have been published (HBRC 5663 and 5664).

**Executive summary**

2. Hawke's Bay supports a diverse range of bird species, including internationally and nationally significant populations of indigenous shorebirds. Baseline river bird surveys were undertaken annually between 2019 and 2021, and a baseline coastal bird survey was undertaken in 2021. This was part of our responsibilities for the sustainable management of natural resources and in line with our strategic goal of healthy, functioning and climate-resilient biodiversity.
3. Cyclone Gabrielle caused widespread impacts to coastal and freshwater bird habitats in Hawke's Bay. To quantify ecological impacts associated with the cyclone, a total of 331 km of the Hawke's Bay coastline, as well as 292 km along the Tukituki, Ngaruroro and Tūtaekurī Rivers was re-surveyed between October 2023 and February 2024. The presence and number of all species of birds encountered was recorded for defined sections and these results were compared with pre-cyclone baseline results.
4. Significant declines were observed for several species. Notably, pohowera/banded dotterel numbers declined by 15% on the three rivers and by 31% along the coast, representing a 17% decline in the regional breeding population of this species. Similarly, the regional population of the river-breeding black-fronted dotterel declined by 30% and the regional population of the coastal-breeding tūturiwhatu/New Zealand dotterel also declined by 36%. Each of these results represent the largest population declines ever observed for these species in Hawke's Bay. It is not yet clear whether these observed declines are a result of adult mortality, or a change in bird distribution in response to declines in habitat quality. To better understand this, and whether populations are recovering, it is recommended that another 3-year series of river bird counts be repeated between 2026 and 2029, and that the coastal bird survey be repeated during the summer of 2028-29. It is also recommended climate change adaptation plans include measures to promote ecological resilience, particularly for climate-vulnerable species which have internationally or nationally significant populations in Hawke's Bay.

**Strategic fit**

5. The surveys contribute to our strategic goal of healthy, functioning and climate-resilient biodiversity (HBRC Strategic Plan 2020-2025).
6. They include critical information to increase the effectiveness of implementation existing and upcoming statutory frameworks including:
  - 6.1. Regional Coastal Environment Plan
  - 6.2. New Zealand Marine Oil Spill Readiness and Response Strategy 2018-2022
  - 6.3. National Policy Statement for Indigenous Biodiversity

- 6.4. National Policy Statement for Freshwater Management
- 6.5. Resource Management Act (Section 30).
7. The survey aligns with programmes in Asset Management, Biosecurity, Biodiversity, Coastal/Marine Science, and Policy workstreams. The dataset will inform the Priority Ecosystem programme, determining Significant Conservation Areas along the coast, and Asset Management operational work.

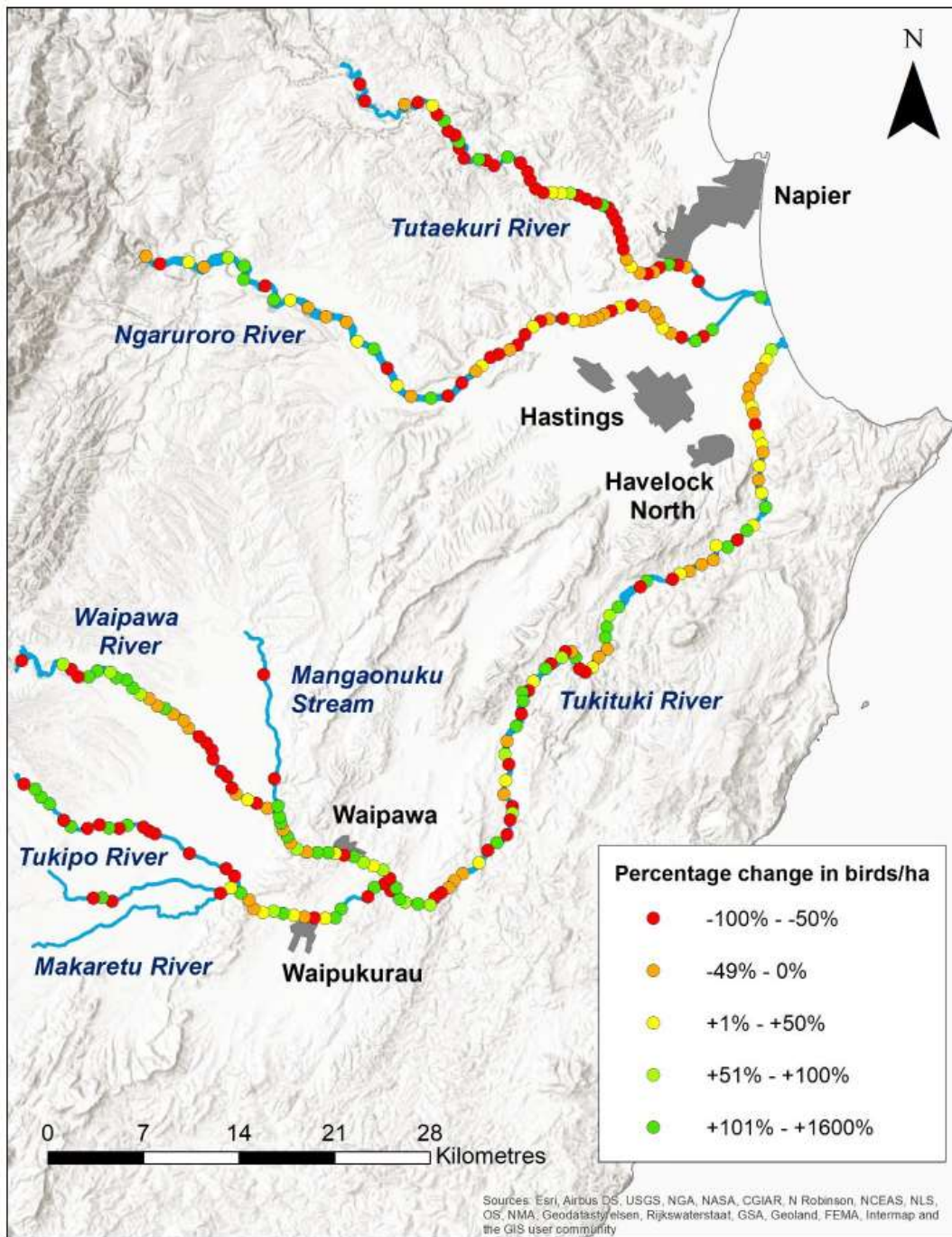
## Background

8. The Tūtaekurī, Ngaruroro and Tukituki River catchments support internationally and nationally significant populations of indigenous shorebirds, including pohowera/banded dotterels, black-fronted dotterels, poaka/pied stilts and tōrea/South Island pied oystercatchers. For example, these three rivers support three of the twelve largest single-river populations of pohowera/banded dotterels in New Zealand, representing an estimated 13% of the global population of this endemic shorebird.
9. Hawke's Bay Regional Council (HBRC) has statutory responsibilities for flood and erosion mitigation in Hawke's Bay, which includes carrying out activities with the potential to adversely impact shorebird populations. To address this risk, an Ecological Management and Enhancement Plan (EMEP) has been developed for each river. HBRC commissioned a three-year series of systematic shorebird surveys along 292 km of the Tūtaekurī, Ngaruroro and Tukituki Rivers between 2019 and 2021 to ensure an accurate, detailed and up-to-date understanding of abundance and distribution of shorebird species to enable the EMEPs to avoid or minimise any adverse impacts.
10. The Hawke's Bay coastline (ca 345 km) is an important breeding and foraging ground for many indigenous birds. A large proportion of these species are threatened or at risk of extinction including the 'Threatened- Nationally Endangered' matuku moana/reef heron and the 'At Risk' tūturiwhatu/New Zealand dotterel and tōrea pango/variable oystercatcher. Species diversity is particularly high at estuaries and coastal lagoons, and along shorelines with a diverse mix of sandy beach and rocky shore habitats.
11. HBRC has statutory responsibilities relating to the sustainable management of the natural values of the Hawke's Bay coastline, including its indigenous bird values. HBRC commissioned a complete and systematic survey of the Hawke's Bay coastline in January 2021, to create a regional-scale baseline measure of the diversity, distribution and abundance of indigenous birds inhabiting the Hawke's Bay coastline.
12. Cyclone Gabrielle caused widespread flooding, sedimentation and woody debris deposition in river catchments, estuaries and along the coastline in February 2023. The existence of the previous bird survey datasets created a unique opportunity to quantify the impact that Cyclone Gabrielle has had on shorebird populations. Quantifying these impacts greatly improves our understanding of how New Zealand's endemic and threatened shorebird species will respond to a changing climate and also assists HBRC to differentiate the impacts of extreme weather events from those caused by the Council's flood mitigation activities. As a result, another survey of the three rivers was commissioned in late 2023, and another survey of the coastline commissioned in early 2024, to allow comparison with pre-cyclone baseline results.

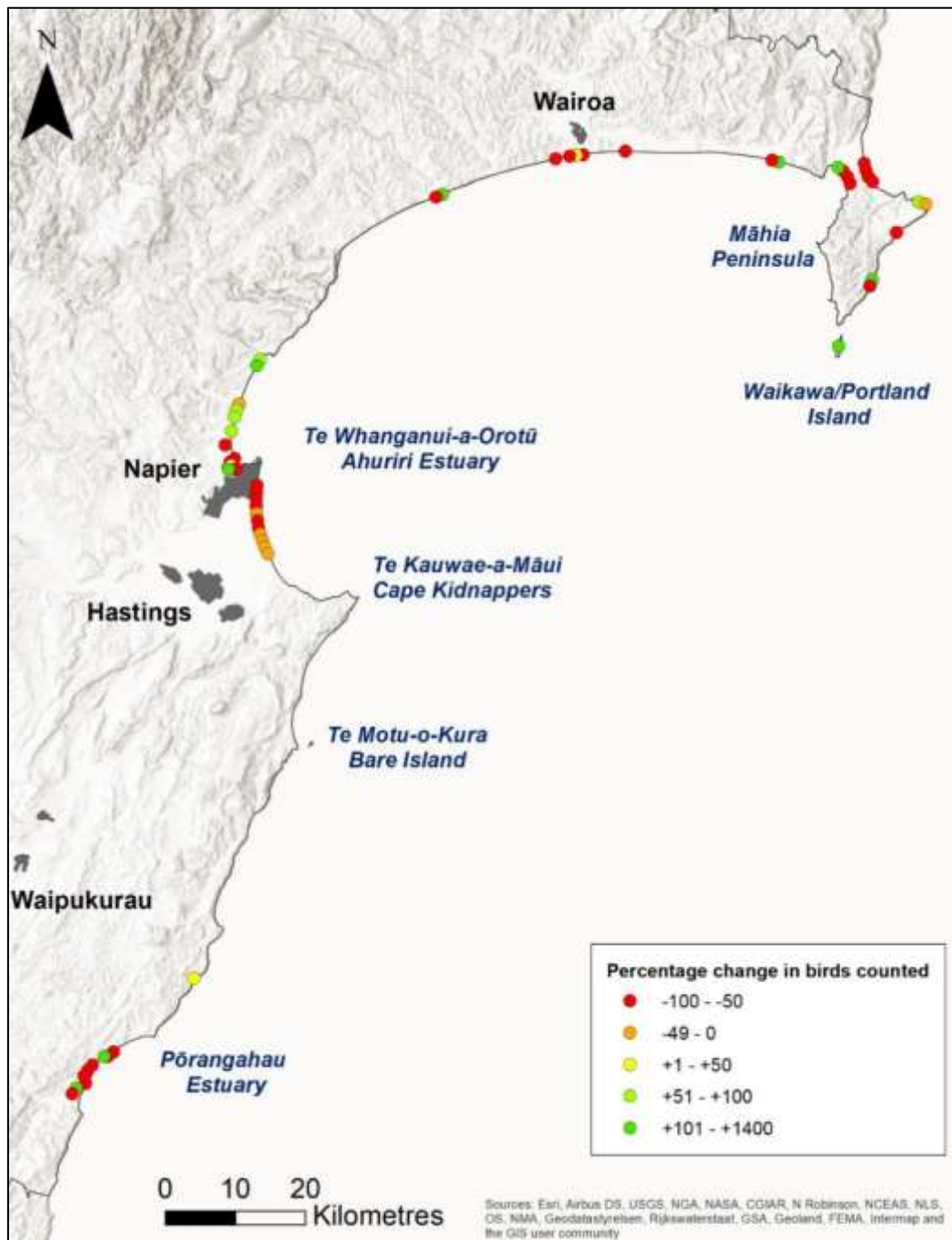
## Discussion

13. A total of 2066 pohowera/banded dotterels were counted in all three river catchments during the 2023 post-cyclone survey, representing a 15% decline from the average of 2418 birds counted during the pre-cyclone surveys. Pohowera/banded dotterel numbers declined by 51% on the Tūtaekurī River, and by 20% on the Ngaruroro River. These are the steepest population declines to have been recorded on these rivers since these bird surveys began in 1962. Declines were not distributed evenly, with most occurring on the Ngaruroro River downstream of Maraekakaho and along the entire length of the Tūtaekurī River (Figure 1).

14. On the Hawke’s Bay coastline, a total of 271 pohowera/banded dotterels were counted during the 2024 post-cyclone survey, representing a 31% decline from the 395 birds counted in 2021. Declines were particularly severe at the base of Māhia Peninsula, in the vicinity of the Wairoa River mouth, along the Napier foreshore between Haumoana and Bayview, and at the Pōrangahau Estuary (Figure 2).
15. Pohowera/banded dotterels are entirely restricted to river and coastal habitats in Hawke’s Bay, so the results of these surveys indicate that the regional breeding population of this species has declined by 17%. It is not yet known whether this regional decline has been caused by bird mortality due to inundation during the cyclone, or by birds emigrating to other parts of New Zealand in response to a decline in local habitat quality. If bird mortality is the cause, then this regional decline of 17% is equivalent to a 2% decline in the global population of this threatened, endemic species.

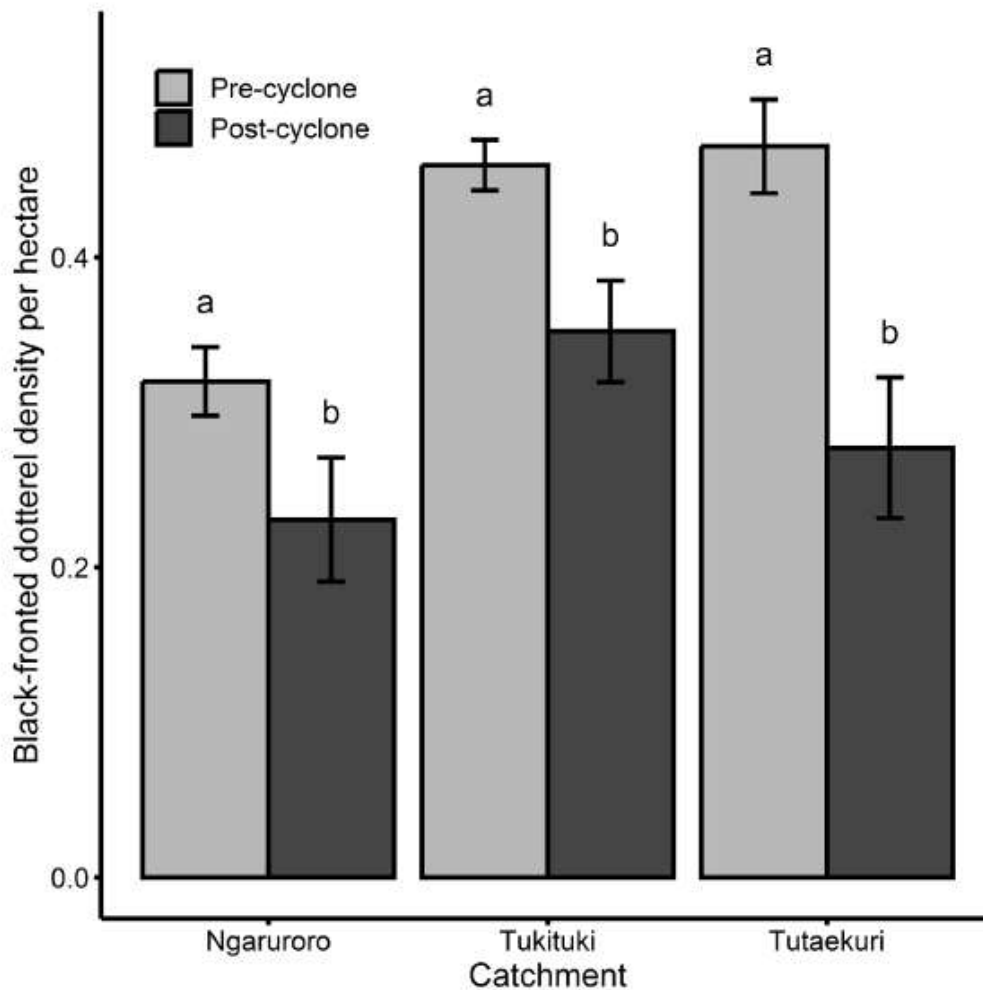


**Figure 1: Percentage change in the density of pohowera/banded dotterels counted per survey section on the Tūtaekurī, Ngaruroro and Tukituki Rivers between 2019-2021 (pre-Cyclone Gabrielle) and 2023 (post-Cyclone Gabrielle).**



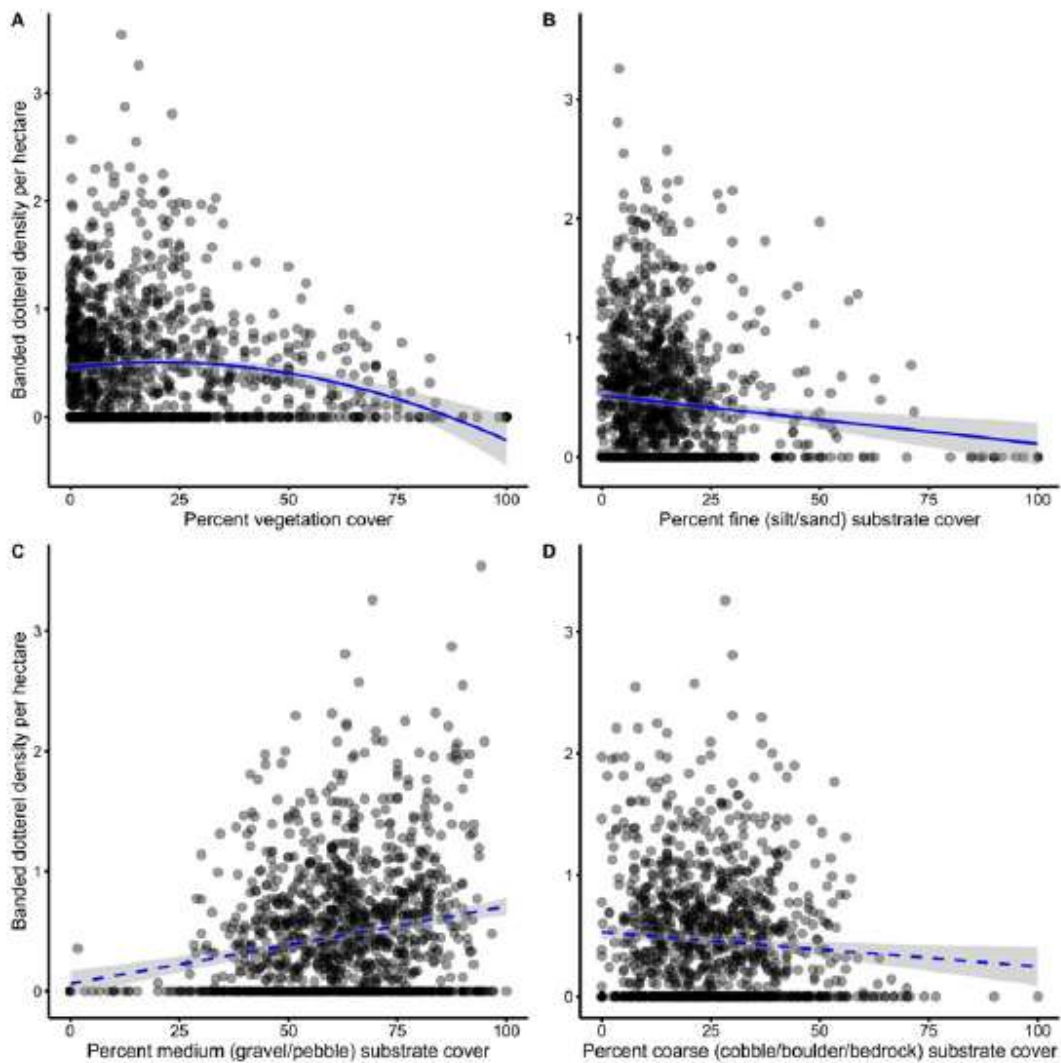
**Figure 2: Percentage change in the number of pohowera/banded dotterels counted per survey section along the Hawke’s Bay coastline in 2021 (pre-Cyclone Gabrielle) and 2024 (post-Cyclone Gabrielle).**

16. A total of 987 black-fronted dotterels were counted in the three river catchments, representing a 30% decline from the average of 1405 birds counted during the pre-cyclone surveys. Black-fronted dotterel numbers declined by 38% on the Tūtaekurī River, by 32% on the Ngaruroro and by 27% on the Tukituki River (Figure 3). These are the steepest population declines to have been recorded in all three of these catchments since these bird surveys began in 1962.
17. Black-fronted dotterels are largely restricted to the riverbeds of Hawke’s Bay, so the 30% decline observed on these rivers represents a 30% decline in the regional breeding population of this species. It is not yet known whether this regional decline has been caused by bird mortality due to inundation during the cyclone, or by birds emigrating to other parts of New Zealand in response to a decline in local habitat quality. If bird mortality is the cause, then this regional decline of 30% is equivalent to a 15-17% decline in the national population of this ‘At Risk’ species.



**Figure 3: Black-fronted dotterel densities (mean  $\pm$  S.E.) in three Hawke's Bay braided river catchments before and after Cyclone Gabrielle. Different lowercase letters indicate significant differences between pre- and post-cyclone surveys within each catchment using post-hoc Tukey tests with Bonferroni correction ( $P < 0.05$ ).**

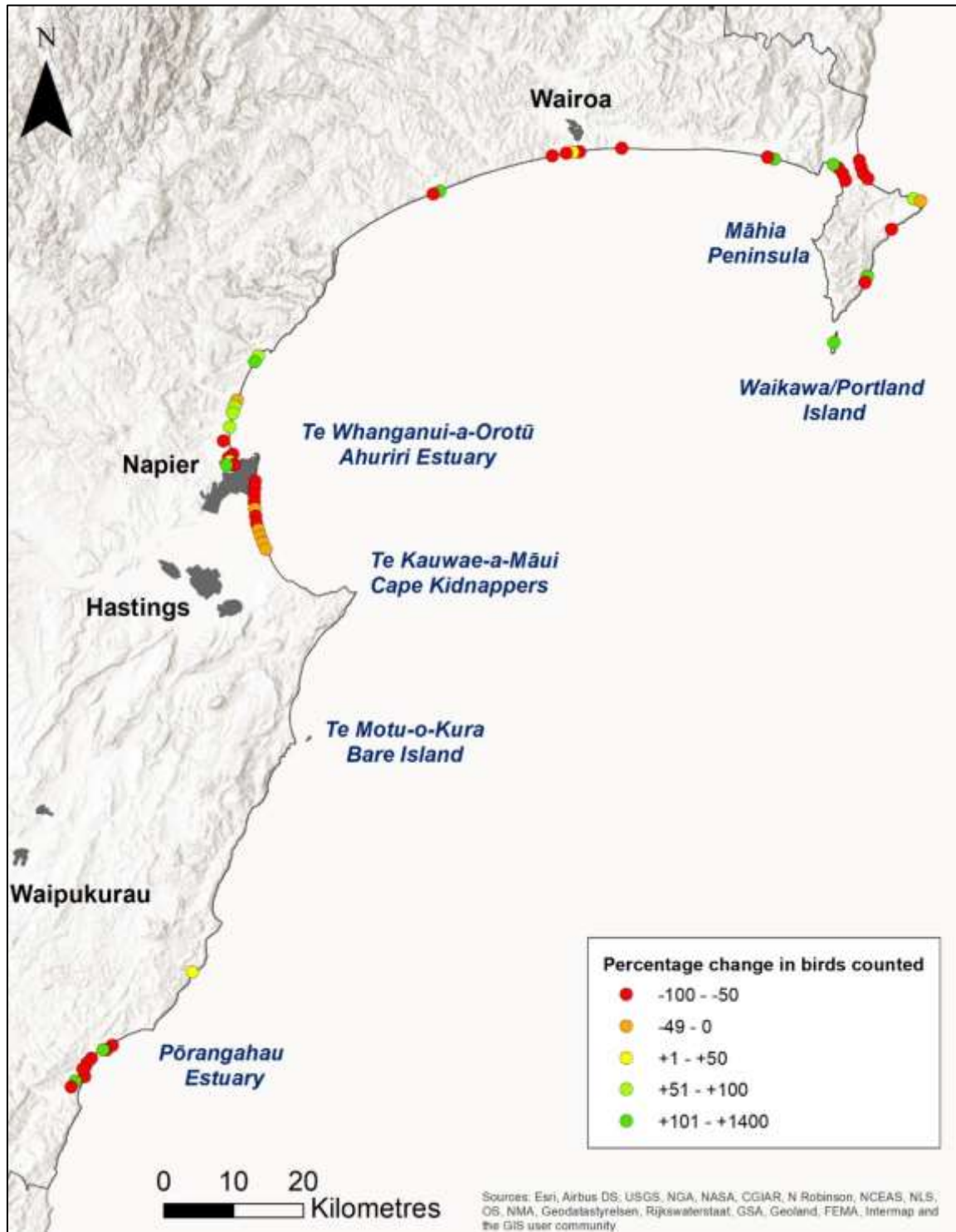
18. A total of 1327 poaka/pied stilts were counted in all three river catchments during the 2023 post-cyclone survey, representing a 16% decline from the average of 1573 birds counted during the pre-cyclone surveys. Poaka/pied stilt numbers declined by 37% on the Tūtaekurī River and by 24% on the Tukituki River but increased by 13% on the Ngaruroro River. On the Hawke's Bay coastline, a total of 1058 poaka/pied stilts were counted during the 2024 post-cyclone survey, representing a 34% decline from the 1606 counted in 2021.
19. 26 tōrea/South Island pied oystercatchers were counted, representing a 43% decline from the average of 46 birds counted during the pre-cyclone surveys. The Tūtaekurī, Ngaruroro and Tukituki Rivers are the only locations in the North Island where this species breeds, so this observed decline represents a 43% decline in the North Island breeding population of this species.
20. Cyclone Gabrielle led to substantial reductions in riverbed vegetation in all three river catchments, and substantial increases in the percent cover of fine sediment. Lower levels of vegetation cover were associated with higher local densities of pohowera/banded dotterels, black-fronted dotterels and pied stilts, and a greater percent cover of fine sediment was associated with higher local densities of pohowera/banded dotterels (Figure 4).



**Figure 4: Relationships between pohowera/banded dotterel density and the percent cover of riverbed vegetation (A) and in fine (B), medium (C) and coarse (D) substrates on Hawke’s Bay braided rivers. Solid and dashed lines represent significant ( $P < 0.05$ ) and non-significant relationships, respectively.**

21. There was significant variation in cyclone impacts between different shorebird species inhabiting the Hawke’s Bay coastline. Population sizes of a number of ‘Threatened’ or ‘At Risk’ species appear to have been unaffected by Cyclone Gabrielle, with similar numbers of matuku moana/reef herons, tōrea pango/variable oystercatchers, tarāpuka/black-billed gulls, tara/white-fronted terns and pīhoioi/New Zealand pipit counted both pre- and post-cyclone.
22. Several other ‘Threatened’ or ‘At Risk’ species do appear to have been severely impacted however, notably kawau/black shag (40% decline), kāruhiruhi/pied shag (42% decline), tūturiwhatu/New Zealand dotterel (36% decline), pohowera/banded dotterel (31% decline) and tarāpunga/red-billed gull (17% decline). Substantial declines were also observed for poaka/pied stilts (34%) and karoro/black-backed gulls (19%), two native species assessed as ‘Not Threatened.’ A 24% decline in kuihi/Canada geese and other introduced and invasive species was also observed.
23. Tūturiwhatu/New Zealand dotterels declined by 36% from 222 birds counted in 2021 to 142 birds counted in 2024, representing a dramatic reversal in population trend for a species that had been increasing steadily in numbers since re-colonising the Hawke’s Bay coastline in 1990. Local declines in tūturiwhatu/New Zealand dotterel numbers were observed along the entire length of the Hawke’s Bay coastline but appeared to be particularly severe at the mouths of the Wairoa and Aropaoanui Rivers, Waipātiki Stream, as well as along the eastern coastline of





**Figure 5: Percentage change in the number of tūturiwhatu/New Zealand dotterels counted per survey section along the Hawke’s Bay coastline in 2021 (pre-Cyclone Gabrielle and 2024 (post-Cyclone Gabrielle).**

24. The results of this survey demonstrate for the first time that extreme weather events exacerbated by human-induced climate change can lead to severe declines in shorebird populations at catchment and regional scales in New Zealand. This in turn provides the first empirical evidence that these species have a high degree of vulnerability to the impacts of climate change. It is not yet clear however whether these observed declines are a result of adult mortality, or a change in bird distribution in response to declines in habitat quality. It is also not yet known whether, or how quickly, these impacted bird populations will recover from these declines.

## Next steps

25. These results provide the first empirical evidence collected in New Zealand that demonstrate the vulnerability of these threatened, endemic shorebird species to climate-change driven extreme weather events, and they demonstrate for the first time that regional breeding populations of these species can suffer significant declines as a result of these weather events.
26. The severity of these declines indicate that climate change adaptation plans need to include measures to mitigate adverse impacts on our natural ecosystems. In the case of Hawke's Bay's internationally and nationally significant populations of riverbed and coastal-nesting shorebirds, mitigation could include large-scale mammalian predator control to offset losses caused by flooding, and the creation of artificial nesting habitats in less flood-prone locations.
27. In the case of coastal shorebirds, future changes in land-use and the construction of coastal defences in response to the rising sea level need to be done in such a way as to avoid a net loss of intertidal and foreshore habitats, as sea level rise causes habitats to migrate inland.
28. It is recommended that a second three-year series of river bird surveys be carried out between 2026 and 2029, and that a third coastal bird survey be carried out during the summer of 2028-2029, to assess the degree to which riverbed and coastal shorebird populations have recovered from the impacts of Cyclone Gabrielle.
29. Understanding whether, or how quickly, these shorebird populations recover from these observed declines will be crucial to further improving our understanding of the vulnerability of these species to the impacts of extreme weather events exacerbated by human-induced climate change. This improved understanding will in turn assist HBRC and other authorities to make better-informed decisions regarding the measures required to mitigate the impacts of climate change on these shorebird populations.

## Decision-making considerations

30. Staff have assessed the requirements of the Local Government Act 2002 in relation to this item and have concluded that, as this report is for information only, the decision-making provisions do not apply.

## Recommendation

That the Environment and Integrated Catchments Committee receives and notes the *Coastal and River Bird Survey findings* staff report.

## Authored by:

**Annabel Beattie**  
Senior Scientist - Terrestrial Ecology

**Becky Shanahan**  
Senior Scientist Marine & Coasts

**Louise van Jaarsveldt**  
Environmental Engineer

## Approved by:

**Iain Maxwell**  
Group Manager Integrated Catchment  
Management

## Attachment/s

There are no attachments for this report.

**Hawke's Bay Regional Council**  
**Environment and Integrated Catchments Committee**

**11 September 2024**

**Subject: Our Landscapes – LiDAR partnership project with Manaaki Whenua Landcare Research**

**Reason for report**

1. This report is an overview of a recent project demonstrating various applications of LiDAR developed in the Manaaki Whenua Landcare Research – Hawke's Bay Regional Council Partnership Project. Tools and reports from the project cover the various applications of LiDAR data that improve land mapping, erosion management, vegetation mapping, and the mapping of ecosystem services. Results of these projects are already being used by HBRC, for example, in the implementation of winter grazing regulation, to assist the pastoral farming sector in identifying erosion-prone land and the quantification of the plantation forestry sector in the region.

**Executive summary**

2. The LiDAR Partnership Project was a collaborative initiative between Hawke's Bay Regional Council and Manaaki Whenua Landcare Research (MWLR) started in 2022 and completed at the end of June 2024.
3. The purpose of the programme is to maximise the benefit from the acquisition of the 2020 LiDAR data for the Hawke's Bay region by taking a partnership approach.
4. The project ran for 2 years with a cost of \$0.5M per organisation.
5. It focuses on the implementation of science into policy and management for HBRC while providing geospatial research gains for MWLR.
6. The research splits into different tools for landscape-scale analysis:
  - 6.1. Improving understanding and management of erosion with LiDAR **(attached)**
  - 6.2. Improving land characterisation with LiDAR **(attached)**
  - 6.3. Vegetation mapping **(attached)**
  - 6.4. Ecosystem services mapping.

**Strategic fit**

7. This work underpins actions and outcomes listed in the 2020-2025 Strategic Plan, such as:
  - 7.1. **Water** – The research improves the understanding of erosion sources through landslide susceptibility and SedNetNZ modelling and the possible sources of sediment to waterways. There are also new stream and river lines alongside redefined watersheds and catchments.
  - 7.2. **Land** – The research improves our mapping of slope and Land Use Capability (LUC). Slope mapping allows for the mitigation of unsustainable land management practices around intensive winter grazing. An updated LUC will inform the spatial representation of Highly Productive Land areas.
  - 7.3. **Biodiversity** – Better understanding of where forest cover is and identifying priority biodiversity areas. Updating of the land uses plantation forestry and horticulture. Measuring riparian extents. Assessing carbon sequestration using canopy heights.

## Background

8. HBRC partnered with Land Information New Zealand (LINZ) in 2020 to invest in LiDAR coverage of the Hawke's Bay region, as part of the wider LINZ National Elevation Programme. The regional LiDAR coverage was available for use in June 2022.
9. Following the LiDAR acquisition, HBRC decided to invest, through the HBRC 2021-31 Long Term Plan, in utilising the LiDAR data across a range of applications to support implementing its objectives under Te Tiriti, Freshwater, Biodiversity and Sustainable Land Management. The collaborative LiDAR partnership programme between HBRC and MWLR aimed to maximise the benefit of LiDAR for the Hawke's Bay region and explored how this 3D data set can address key environmental science questions.
10. MWLR also recognised the opportunity that regional LiDAR coverage creates for its scientific research, and in particular application of its science to support its regional council partners. For this reason, MWLR decided to cooperate on and co-fund a programme of work with HBRC. MWLR envisions that the application of its LiDAR-enabled science in the Hawke's Bay region will benefit future applications in other regions that MWLR partners with.

## Deliverables

11. The following is a list of deliverables under the various workstreams.
  - 11.1. Improving understanding and management of erosion:
    - 11.1.1. Upgrade regional SedNetNZ erosion and sediment load modelling.
    - 11.1.2. Improve the spatial representation of the stream network and watersheds (part of SedNetNZ model development).
    - 11.1.3. Regional-scale shallow landslide susceptibility modelling.
  - 11.2. Improving land characterisation:
    - 11.2.1. Regional slope map(s) to support implementation of HBRC policies, e.g., for consultants to use during farm plan development
    - 11.2.2. Regional updated Land Use Capability (LUC) map(s) for LUC classes 1 -3 to support both farm planning and regional mapping of highly productive land
    - 11.2.3. Additional regional land characterisation layers based on consultation with farm plan consultants and HBRC needs, such as intensive winter grazing.
  - 11.3. Vegetation mapping:
    - 11.3.1. Digital models of canopy height, surface, ground and modelled daylight/shadow at very high resolution, i.e., 30 cm pixel size
    - 11.3.2. Specific spatial vegetation layers (agreed in discussions with HBRC), such as individual trees, forests, tree canopy, short vegetation, shelter belts, pine/exotic forest
    - 11.3.3. Investigating experimental LiDAR case studies, as needed by HBRC, such as horticultural uses.
  - 11.4. Ecosystem Services:
    - 11.4.1. Output map layers quantifying ecosystem services for a selected case study area within Hawke's Bay
    - 11.4.2. Software code available for the open-source R programming language.

## Discussion

### Reflections on ‘Improving understanding and management of erosion with LiDAR’.

12. The benefits of using higher resolution LiDAR-derived Digital Elevation Models (DEMs) in erosion and sediment load modelling include:
  - 12.1. improved model performance
  - 12.2. better representation of the stream network
  - 12.3. the ability to provide higher resolution information for selected erosion processes, namely shallow landslide, and surface erosion.
13. The upgrade to the shallow landslide susceptibility model gives land managers higher resolution spatial information that may be used to better target tree planting to those pastoral areas most susceptible to slope instability.
14. The new LiDAR-based version of SedNetNZ provides both improved predictions of contributions from erosion processes to suspended sediment loads, as well as high-resolution mapping of shallow landslides and surface erosion not previously available that may be used to better support land and water planning in the region.
15. The upgraded SedNetNZ model included refining the digital stream network and sub-watersheds. The subwatersheds form the basis for determining suspended sediment budgets. The new LiDAR-based SedNetNZ model estimated a total region-wide suspended sediment load delivered to the coast of 8.0 Mt yr<sup>-1</sup>, which compares to 7.2 Mt yr<sup>-1</sup> using the previous model. The LiDAR-based model also showed improved agreement with longer-term estimates of mean annual suspended sediment loads from stream gauging sites in the region.

### Reflections on ‘Improving land characterisation with LiDAR’.

16. The slope gradient has been computed in degrees for 1 m and 5 m resolutions and allocated to classes in S-map/LUC and Intensive Winter Grazing slope classifications. Because the slope estimates have a footprint of 400 m<sup>2</sup> and are gridded at very high resolution, it is anticipated they will be useful for informing land management decisions at the farm scale. They will also be useful for supporting region-wide activities, such as the mapping of LUC and/or implementation of Intensive Winter Grazing rules. Caution is needed when applying the slope maps to support decision-making, as further analysis, interpretation or contextual information may be required to make sensible, well-informed decisions.

### Reflections on ‘Vegetation mapping’.

17. The project was aimed at producing high-resolution spatial GIS layers that could be used for identifying and mapping different types of vegetation. About 1 Terabyte of aerial LiDAR was processed and translated into regional maps of vegetation information.
18. The layers provide unprecedented detail of land surface and vegetation structure for the Hawke’s Bay region. The canopy height information overlaid with forests, shelter belts, pine stands, and individual trees provides a comprehensive vegetation layer at the regional scale. It also vastly surpasses the spatial detail of previous large-scale land cover products, such as the Land Cover Database of New Zealand (LCDB v.5.0) created by MWLR (2020).
19. The purpose of this work was not only to generate one-off data products but also to create baseline methods and datasets that can be updated and refined in the future and used for change detection. The methods are transparent and repeatable.

### Reflections on ‘Ecosystem services mapping’.

20. Quantifying ecosystem services was a pilot project testing the potential of combining LiDAR products with other national or global-scale data to estimate some ecosystem services. The project focused on a small case study area north of Wairoa. The models used have been

provided in a form that makes them reusable in other areas. Ecosystem services modelling is highly uncertain and, therefore should not be solely relied on for decision-making.

21. The ecosystem services that were mapped in the case study were:
  - 21.1. The proportion of runoff and nutrients retained by the landscape. The amount of nutrient is not quantified but the results are suited to comparing between scenarios
  - 21.2. The amount of biomass carbon stored in trees
  - 21.3. Air pollution removal in kg per day of PM<sub>10</sub> (particulate matter less than 10 microns in size)
  - 21.4. Ultraviolet protection and shade provided by tree canopies
  - 21.5. A score of landscape aesthetics, which combines scores for the physical area of the landscape that can be viewed at a point and the relative attractiveness of different land cover types.

### Next steps

22. Still to do:
  - 22.1. Roll out the dedicated HBRC website to access reports, project information and data requests.
  - 22.2. Host layers on platforms enabling public and organisation-wide use.
  - 22.3. Re-run layers with the new LiDAR information from December 2023 (where applicable) or when new information comes to light.

### Decision-making considerations

23. Staff have assessed the requirements of the Local Government Act 2002 in relation to this item and have concluded that, as this report is for information only, the decision-making provisions do not apply.

### Recommendation

That the Environment and Integrated Catchments Committee receives and notes the *Our Landscapes – LiDAR partnership project with Manaaki Whenua Landcare Research* staff report.

### Authored by:

**Dr Ashton Eaves**  
Senior Scientist - Land

**Dr Kathleen Kozyniak**  
Team Leader Marine Air & Land Science

### Approved by:

**Iain Maxwell**  
Group Manager Integrated Catchment Management

### Attachment/s

- |          |  |   |
|----------|--|---|
| <b>1</b> | Improving understanding and management of erosion with LiDAR 2024    | Under Separate Cover<br><a href="#">online only</a> |
| <b>2</b> | Mapping slope using Hawke's Bay's LiDAR digital elevation model 2024 | Under Separate Cover<br><a href="#">online only</a> |
| <b>3</b> | LiDAR-derived vegetation layers in Hawke's Bay 2024                  | Under Separate Cover<br><a href="#">online only</a> |

**Hawke's Bay Regional Council**  
**Environment and Integrated Catchments Committee**

**11 September 2024**

**Subject: Air Quality Monitoring update**

**Reason for report**

1. This report provides a summary of the information to be presented in the Air Quality Monitoring Update. Specifically, it includes:
  - 1.1. An update on the replacement of our existing PM<sub>10</sub> monitoring equipment with new monitoring equipment.
  - 1.2. An overview of the instrument co-location study at the St John's air quality site in Hastings.
  - 1.3. An explanation of the implications of using the new monitoring equipment for regulatory PM<sub>10</sub> monitoring – particularly in the Hastings airshed.

**Executive summary**

2. PM<sub>10</sub> is an air pollutant of concern in Hawke's Bay because of its detrimental effects on human health and high concentrations found in some urban areas. PM<sub>10</sub> monitoring, implemented in 2005 in Napier and Hastings, has shown a reduction in concentrations in response to policy and other measures to reduce PM<sub>10</sub> emissions. The number of PM<sub>10</sub> exceedances in the Hastings airshed has reduced to 1 or none in recent years.
3. HBRC is replacing the instruments used to monitor PM<sub>10</sub>. The new instruments measure PM<sub>10</sub> using different technology, therefore we must understand how they compare to the existing instruments.
4. A co-location study at the St John's monitoring site in Hastings (**attached**) compared measurements from the existing instruments (BAMs), the new instrument (optical sensor) and a reference method. The results showed that the BAM measurements have been under-estimating PM<sub>10</sub>, but the optical measurements provide an accurate estimation of PM<sub>10</sub> concentrations.
5. It is the intention to use the optical PM<sub>10</sub> data for reporting against the National Environmental Standards for Air Quality. However, using the optical data since it began recording in 2022 will result in 9 additional exceedances of the NESAQ that must be publicly reported. This also means that the Hastings airshed continues to be defined as a 'polluted' airshed under the RMA, with implications for HBRC and resource consent applicants.

**Strategic fit**

6. Infrastructure and Services – The monitoring of air quality provides the necessary information to assess whether HBRC is achieving its strategic goal of consistently meeting the World Health Organisation guidelines for ambient air quality by 2025.
7. Monitoring for PM<sub>10</sub> is essential for assessing compliance with the National Environmental Standards for Air Quality (NESAQ) within our airsheds.

**Background**

8. In 2004, the Government introduced the NESAQ which led to the creation of the Napier and Hastings Airsheds for the purposes of managing ambient air concentrations of PM<sub>10</sub>. PM<sub>10</sub> is of significant concern because these particles are so small that they can be inhaled and lodge deep

within the lungs. This can trigger asthma attacks and respiratory and cardiovascular diseases, leading to increased hospital admissions, missed school days, lost productivity, lung cancer, and premature deaths.

9. HBRC has been monitoring PM<sub>10</sub> since 2005 to assess the compliance of our airsheds with the NESAQ. This monitoring shows that, while outdoor air quality is generally good for most of the year, higher PM<sub>10</sub> concentrations occur over the Napier and Hastings urban centres on cold and clear winter nights.
10. Historically, the Hastings airshed had the highest number of PM<sub>10</sub> exceedances per year, but this number has steadily decreased since the implementation of the Air Plan in 2008 and other measures to reduce PM<sub>10</sub> pollution. In recent years the Hastings airshed has had only 1 or no exceedances, bringing it close to changing its status from 'Polluted' to 'Not Polluted' as defined in the NESAQ.
11. The instruments we currently use for measuring PM<sub>10</sub> and PM<sub>2.5</sub> are reaching their end of life and need replacing. These instruments are known as Beta-Attenuation Monitors (BAMs) and use beta attenuation to measure particulate matter.
12. New instruments have been purchased to replace the existing instruments at our monitoring sites. These new instruments are known as optical sensors and use principles of light scattering to measure the amount of particulate matter collected in a filter.
13. Because of the difference in measurement methodology we must operate both of the instruments side-by-side (co-locate) for at least 1 year to determine whether there is a difference in the measurements of PM<sub>10</sub>.

#### **Co-location study**

14. A co-location study was carried out at the St John's monitoring site in Hastings from April 2022 to April 2023. The study involved collecting data from BAMs, an optical sensor and reference method samplers. The reference method samplers collect particulate matter on filters, which are subsequently weighed in a laboratory to determine PM<sub>10</sub> mass. The reference method provides a standard of PM<sub>10</sub> measurement against which the other methods can be compared. PM<sub>10</sub> data from each of the monitoring methods are analysed to determine whether the instruments can be considered 'equivalent' to each other.
15. Results from the co-location study are:
  - 15.1. BAM PM<sub>10</sub> measurements were not equivalent to the reference method PM<sub>10</sub>. At reference method concentrations of 50 µg/m<sup>3</sup> the BAM is estimated to measure a concentration of around 34 µg/m<sup>3</sup>, significantly lower than the reference method.
  - 15.2. The optical sensor PM<sub>10</sub> measurements were equivalent to the reference method PM<sub>10</sub>. At reference method concentrations of 50 µg/m<sup>3</sup> the optical method is estimated to measure a concentration of 50.7 µg/m<sup>3</sup>.
16. In May of 2024, following the completion of the co-location study, the live reporting of PM<sub>10</sub> and PM<sub>2.5</sub> data from the St John's site in Hastings was switched from the BAM data to the new data from the optical sensor.

#### **Discussion**

17. The results of the co-location study have shown that the BAM has not been providing an accurate representation of PM<sub>10</sub> concentrations for the Hastings airshed and may have been under-estimating the number of days exceeding the NESAQ for PM<sub>10</sub> each year. PM<sub>10</sub> data from the optical sensor is a much better match with the reference method, and therefore a more accurate representation of PM<sub>10</sub> concentrations.
18. In light of the results of the co-location study, it is our intention to utilize PM<sub>10</sub> data from the optical sensor for NESAQ reporting. This data extends back to March 2022. The implications of



using this data are that there will be a number of additional exceedances of the NESAQ that HBRC will have to publicly report

- 18.1. In 2022 there are 7 additional days that exceed the PM<sub>10</sub> standard
- 18.2. In 2023 there are 2 additional days that exceed the PM<sub>10</sub> standard.

### Policy implications

19. The Regional Council is responsible for undertaking the necessary actions to achieve the NESAQ which aim to guarantee a minimum level of health protection for New Zealanders. Updated PM<sub>10</sub> monitoring data shows that the Hastings Airshed is not complying with the NES for PM<sub>10</sub> as previously thought. This has the following implications:
  - 19.1. Increased health risks for the Hastings community
  - 19.2. Regular reporting on air quality and public notice of breaches
  - 19.3. In the Hastings Airshed, applications for resource consent to increase discharges of PM<sub>10</sub> into the air by more than 2.5 micrograms per cubic metre must be declined unless offsetting occurs. Typically, industrial activities require resource consents for their air discharges.
20. These matters will be addressed in the ongoing development of the Kotahi Plan. During this process, the Council will work with tangata whenua and our communities to identify the most effective approach for Hastings to ensure compliance with the PM<sub>10</sub> ambient air quality standard moving forward.

### Next steps

21. Public reporting of the 9 additional PM<sub>10</sub> exceedances in the Hastings airshed. This involves putting a public notice in the Hawke's Bay Today newspaper and a page on our website containing the dates and PM<sub>10</sub> concentrations for each exceedance.
22. Media release explaining the additional exceedances in the Hastings monitoring record.

### Decision-making considerations

23. Staff have assessed the requirements of the Local Government Act 2002 in relation to this item and have concluded that, as this report is for information only, the decision-making provisions do not apply.

### Recommendation

That the Environment and Integrated Catchments Committee receives and notes the *Air Quality Monitoring update* staff report.

### Authored by:

**Jeremy Kidd**  
Scientist Air Quality

**Dr Kathleen Kozyniak**  
Team Leader Marine Air & Land Science

### Approved by:

**Iain Maxwell**  
Group Manager Integrated Catchment Management

### Attachment/s

- 1 [🔗](#) St John's Particulate Matter Monitoring Methods August 2024 Under Separate Cover  
*online only*



**Hawke's Bay Regional Council**  
**Environment and Integrated Catchments Committee**

**11 September 2024**

**Subject: 3D Aquifer Mapping project closure – What did we find and how will this information be used?**

**Reason for report**

1. In June 2024, the final delivery of the 3D Aquifer Mapping Project was completed, marking the conclusion of this five-year initiative.
2. This report summarises findings from the 3D Aquifer Mapping Project (SkyTEM) and includes:
  - 2.1. an overview of the research programme, including revisiting the objectives and outcomes sought, timeframes, budgets and partners involved
  - 2.2. a summary of the data collected, analysis undertaken, and findings.

**Executive summary**

3. The 3D Aquifer Mapping Project was a five-year initiative (2019–2024) jointly funded by the Provincial Growth Fund (PGF), Hawke's Bay Regional Council (HBRC) and GNS Science (GNS). The project applied Airborne Electromagnetic surveys (SkyTEM) technology to improve the mapping and modelling of groundwater resources within the Heretaunga Plains, Ruataniwha Plains and Poukawa and Otane Basins. The 3D Aquifer Mapping Project involved collaboration between HBRC, GNS and the Aarhus University HydroGeophysics Group (from Denmark).
4. Using SkyTEM to improve the mapping and modelling of groundwater resources provided a much wider and deeper spatial coverage than previously obtained using drilling data alone. The AEM data, combined with borehole information, significantly enhanced our understanding of the location, extent, and physical properties of hydrogeological layers, such as aquifers and confining layers.
5. The structure of groundwater systems, including the thickness and extent of hydrogeological layers, plays a crucial role in both quantitative and qualitative analyses. Poorly conceptualised settings, stemming from limited knowledge of the hydrogeological framework, can result in incorrect parameterisation, misleading model predictions, and ultimately sub-optimal groundwater management decisions. The Heretaunga Plains groundwater model was used to assess the value of the SkyTEM data and showed a significant reduction in uncertainty for many predictions due to the enhanced hydraulic properties informed using SkyTEM.

**Strategic fit**

6. Information gathered through the 3D Aquifer Mapping Project assists the Council in achieving its strategic goals by:
  - 6.1. **Improving Groundwater Management:** The data from the project enables more accurate modelling of groundwater systems, leading to better-informed decisions about water allocation, usage, and protection of water quality. This aligns with the Council's goal of maintaining high water quality standards and ensuring reliable water supplies.
  - 6.2. **Supporting Policy Development:** The improved understanding of groundwater systems supports the development of sound and defensible policies, such as those related to Plan Changes 6 and 9. This helps the Council meet its strategic vision of protecting Hawke's Bay's natural resources and ensuring a resilient and prosperous community.

## Background

7. The concept of using SkyTEM to map regionally significant groundwater resources was proposed by HBRC Staff during the development of the Heretaunga groundwater model. This led to discussions between the GNS and Council on the potential application of airborne electromagnetic (AEM) technology for groundwater mapping.
8. In 2017, following discussions with GNS, a proposal for an AEM survey was presented to the Council as part of Science's business case for the Long-Term Plan (LTP). This business case proposed to deliver a high-resolution geophysical dataset for the entire Heretaunga Plains aquifer system. At the request of the Council, this was extended to include the Ruataniwha Basin and was adopted in the 2018-2028 Long-Term Plan.
9. In 2018 and 2019, HBRC engaged GNS Science and Project Haus Ltd to carry out planning for the SkyTEM survey and to develop a strategy for all tasks required for processing, modelling, and interpretation of SkyTEM data, including refinement of groundwater knowledge and information (such as refining geological and groundwater models).
10. In early 2019, with assistance from GNS and Project Haus Ltd, HBRC applied to the Provincial Growth Fund (PGF) for additional funding. The application included surveying the Poukawa and Otane Basins in addition to the Heretaunga and Ruataniwha Plains. This was notified as successful in June 2019.
11. A total budget of \$4.86 million was set for the 3D Aquifer Mapping Project, covering costs for the SkyTEM survey, additional data collection (including drilling, resistivity, and geological modelling), and refinement of the Heretaunga numerical groundwater model. Provisions for all services and work were included in the Council's Long-Term Plan. Funding sources comprised approximately \$1.9 million in capital loan funding and \$400,000 from general rates. A significant achievement of the project was the securing of \$2.1 million from PGF funding, alongside \$300,000 in in-kind contributions from GNS. This greatly enhanced the project's financial efficiency and reduced the burden on the Council.

## When was the survey flown?

12. In October 2019, SkyTEM Australia Pty Ltd was contracted by HBRC to AEM data using SkyTEM technology. This was flown using a helicopter during the period 12 January to 10 February 2020 using a New Zealand company Heli A1 Limited.
13. The survey acquired ~7,800 kilometres of transient electromagnetic (TEM) and magnetic data. The Heretaunga surveys delivered ~2,500km of data along transects spaced approximately 170 metres apart. The Ruataniwha survey delivered ~3900km of data along transects spaced approximately 250 metres apart. The Poukawa survey delivered ~1200 km of data along transects spaced 200 metres apart. A further ~70km of data was collected offshore spaced 400m apart.
14. Processing of SkyTEM data was finalised in 2022, which included removing electromagnetic noise and developing resistivity models. By 2023, all SkyTEM products, including resistivity model interpretations and hydrogeological models, were completed. The task of integrating SkyTEM data into the Heretaunga Plains groundwater model was completed in 2024, along with testing to evaluate the worth of SkyTEM data in terms of reducing predictive uncertainty.
15. Throughout the 3D Aquifer Mapping project, the Council regularly updated its website with progress newsletters, project videos, and links to technical reports. To improve public understanding and engagement, key information was summarised and showcased on an ESRI StoryMap. This interactive platform features a web map where users can download data and utilise tools such as cross-sections and virtual wells to explore the subsurface more effectively. For further details, visit the project page (<https://www.hbrc.govt.nz/hawkes-bay/projects/3d-aquifer-mapping-project/>) and for the ESRI StoryMap visit the project page here (<https://storymaps.arcgis.com/stories/7455b027ae0540d8a3457de98635ac84>)

**List of outputs/deliveries**

16. The bullet points below include hyperlinks to the reports and products generated throughout the 3D Aquifer Mapping Project.
17. Heretaunga Plains
  - 17.1. [3D Hydrogeological models from SkyTEM data in the Heretaunga Plains](#)
  - 17.2. [Delineation of major hydrogeological units within the Heretaunga Plains from skyTEM-derived resistivity models](#)
  - 17.3. [Heretaunga Plains data and model inventory](#)
  - 17.4. [Heretaunga Plains numerical groundwater model updates using SkyTEM data](#)
  - 17.5. [Heretaunga Plains SkyTEM data processing and resistivity models](#)
  - 17.6. [Heretaunga Plains, 3D hydrostratigraphic modelling](#)
  - 17.7. [Drilling Completion Report for Borehole 17137\(3DAMP Well2\), Morely Road, Heretaunga Plains](#)
  - 17.8. [Deep borehole interpretation within Heretaunga Plains in the context of SkyTEM data and new Borehole 17137](#)
  - 17.9. Dataworth analysis using the SkyTEM data and the Heretaunga Plains groundwater model (in publication).
18. Ruataniwha Plains
  - 18.1. [Hydrostratigraphic modelling in the Ruataniwha Plains](#)
  - 18.2. [3D hydrogeological models from SkyTEM data in the Ruataniwha Plains](#)
  - 18.3. [Delineation of Hydrogeological Basement within the Ruataniwha Plains from SkyTEM-derived resistivity models](#)
  - 18.4. [Ruataniwha Plains data and model inventory](#)
  - 18.5. [Ruataniwha Plains SkyTEM data processing and resistivity models](#)
  - 18.6. [Drilling Completion Report for Borehole 17164 \(3DAMP Well3\), Burnside Road, Ruataniwha Plains](#)
  - 18.7. [Drilling Completion Report for Borehole 17136 \(3DAMP Well1\), Ongaonga-Waipukurau Road, Ruataniwha Plains](#)
  - 18.8. [Interpretation of key boreholes in the Ruataniwha Plains.](#)
19. Otane/Poukawa Basins
  - 19.1. [Hydrogeology interpretation of SkyTEM-derived resistivity models within the Poukawa and Otane basins](#)
  - 19.2. [Poukawa and Otane Basin SkyTEM data processing and resistivity models.](#)
20. Other products
  - 20.1. [3D Aquifer Mapping Fact Sheet](#)
  - 20.2. [3D tool further information](#)
  - 20.3. [SkyTEM Helicopter Electromagnetic Survey Hawkes Bay Acquisition and Processing Report](#)
  - 20.4. [StoryMap.](#)

## Discussion

21. The primary objective of the 3D aquifer mapping project was the provision of improved scientific data and information, leading to accurate and reliable groundwater management decisions. This information is vital to ensure the health and well-being of groundwater resources are protected (including surface water connections), drinking water is safe, and users have confidence in the reliability of supply.
22. Aerial Electromagnetic data was collected to help understand the location, extent, and physical properties of hydrogeological layers (i.e., aquifers and confining layers). The hydrogeological framework is a fundamental source of information for quantitative and qualitative groundwater analysis. Poorly conceptualised settings based on limited knowledge of the hydrogeological framework can lead to incorrect parameterisation, erroneous or misleading model predictions, and ultimately sub-optimal groundwater management decisions.
23. The hydrogeologic framework for most groundwater analysis is traditionally based on lithological borehole logs; however, scarcity of lithological logs (particularly at depth or over difficult terrain) and low-quality logs means existing information is often missing or insufficient to fully capture regional and local-scale geological structures. This, coupled with the high cost associated with drilling and professionally logging exploration wells, means characterising groundwater systems with a dedicated drilling programme is neither practical nor feasible.
24. Aerial Electromagnetic data provided a cost-effective, non-invasive data collection method to map large areas with a higher density of data coverage and the ability to cover areas with rugged terrain with minimal impacts on local activities. AEM data, combined with existing borehole data, provided considerable improvement in understanding the hydrogeologic framework at a level of accuracy not previously achievable. Such refinements, improve the reliability of the predictions made using models and provide water resource managers with increased confidence in the data upon which their decisions are based.
25. A significant amount of staff time and cost goes into the development of numerical groundwater models such as the Heretaunga and Ruataniwha Plains. The results of these models underpin policy development such as those used for Plan Change 9 (TANK) and Plan Change 6 (Tukituki). Understanding the complex groundwater and surface water interactions in the Heretaunga and Ruataniwha Plains allows managers to develop defensible and sound policies in support of these plan changes. Furthermore, the simulation of management scenarios, aimed at balancing the demand for water supply with impacts on the environment, are critical in setting allocation limits.

## Next steps

26. The availability of SkyTEM data presents multiple opportunities for use of the data to further develop our science and knowledge base. The following workstreams are potential applications for the use of SkyTEM data. Some of these applications may require additional funding to support their development and are not our current focus. Funding for this LTP is tagged to the refinement of groundwater and surface water models in the Tukituki catchment. This is a significant piece of work requiring substantial staff time and external funding.
27. Potential next steps using SkyTEM data include:
  - 27.1. **Ongoing Groundwater Model Refinement** – The numerical model used to evaluate the data value of SkyTEM has assessed the reduction in predictive uncertainty under steady-state conditions. However, additional work is needed to incorporate SkyTEM data into the transient (time-varying) model. Given the current fiscal environment and the potential absence of imminent policy changes, it may be more prudent to defer this update until a Plan change is considered, unless there is an immediate need to advance this work. Further discussion and planning are required to determine the urgency and timing of these efforts.

- 27.2. **Revisiting resistivity models and interpretations** – New drilling information and advancements in AEM technology may mean there is a benefit at some point in the future to remodel resistivity and interpretations.
- 27.3. **Contaminant vulnerability assessments** – SkyTEM technology has been used overseas to enhance the detection and mapping of subsurface contaminants, identify potential sources of pollution, and assess the spread and impact of contaminants on groundwater and soil. By providing high-resolution data on subsurface conditions, SkyTEM aids in evaluating the vulnerability of various environmental components to contamination, informing risk management strategies and remediation efforts.
- 27.4. **Continue to watch this space** – The use of Airborne Electromagnetic (AEM) methods is increasingly prominent in groundwater science. HBRC pioneered the use of SkyTEM for aquifer mapping among Regional Councils. Surveys have now been completed for Wellington and Gisborne, with additional surveys planned for Northland, Otago, and Southland (<https://www.aquaintel.co.nz/>). We will continue to monitor developments in these areas.

### Decision-making considerations

28. Staff have assessed the requirements of the Local Government Act 2002 in relation to this item and have concluded that, as this report is for information only, the decision-making provisions do not apply.

### Recommendation

That the Environment and Integrated Catchments Committee receives and notes the *3D Aquifer Mapping project closure – What did we find and how will this information be used?* staff report.

### Authored by:

**Simon Harper**  
**Team Leader Hydrology & Groundwater**  
**Science**

### Approved by:

**Iain Maxwell**  
**Group Manager Integrated Catchment**  
**Management**

### Attachment/s

There are no attachments for this report.





**Hawke's Bay Regional Council**  
**Environment and Integrated Catchments Committee**  
**11 September 2024**

**Subject: Public Waterways and Ecosystem Restoration Fund Project Report**

**Reason for report**

1. To provide the committee with an update on the recently completed Hāpara Takatū (Shovel Ready) riparian fencing project.

**Executive summary**

2. The Hāpara Takatū project ran from November 2020 to June 2024. It was rapidly developed in response to the Government strategy following the COVID-19 outbreak and its aim was to accelerate 'shovel ready' riparian fencing projects, while providing employment opportunities in the wake of COVID-19.
3. The project had a total budget of \$4.2 million. \$4,133,316 was allocated, of which \$2,048,201 was leveraged from Central Government.

MfE Public Waterways and Ecosystem Restoration Fund	\$2,048,201.62
HBRC Erosion Control Scheme	\$1,872,346.63
HBRC in-kind contribution	\$48,750
Landowner and other contributions	\$164,018.14
<b>Total</b>	<b>\$4,133,316.39</b>

4. Hāpara Takatū was comprised of 82 individual fencing projects on properties spread across the region. At its peak, up to 35 individuals were working on fencing projects concurrently, with approximately 52,237 person-hours worked.
5. Over the course of the project, 187.5km of fencing was completed with a further 15.2km repaired or replaced following Cyclone Gabrielle.
6. Hāpara Takatū fencing has protected 129km of waterway and 841.6ha of land. This includes significant areas of land at risk of erosion, as well as indigenous bush and wetland ecosystem.

**Strategic fit**

7. The Hāpara Takatū project aligns with the following HBRC strategic goals:
  - 7.1. *Water – By 2050, there is an increasing trend in the life-supporting capacity in the region's degraded rivers and major streams.*
  - 7.2. *Land – By 2025, stock is excluded from all flowing permanent and intermittent rivers/ creeks, lakes, and wetlands, and at least 30% are fenced and planted to filter contaminants.*
  - 7.3. *Other - Jobs for Nature – Helping to revitalise communities through nature-based employment and to stimulate the economy post COVID-19.*

**Background**

8. In April 2020, during the first COVID-19 lockdown, HBRC staff were asked to brainstorm potential 'shovel-ready' projects to form part of a Regional Sector Enhancement bid.

9. An accelerated riparian fencing project was one of 43 projects put forward. It had the potential to generate immediate (fencing) and longer term (planting) employment opportunities. Project work was validated as 'shovel-ready' on the basis that planned fencing was already documented in farm erosion control plans.
10. The project was shortlisted but considered to lack the necessary scale. Catchment Team staff were tasked with contacting landowners to identify further eligible shovel-ready fencing opportunities.
11. Once a critical mass of projects had been consolidated, the proposition was bounced between different Jobs for Nature (J4N) programmes, eventually landing with MfE's 'Public Waterways and Ecosystem' (PWER) fund. A deed of funding was finally signed in November 2020.
12. The protracted timeframes created some budgeting issues with regard to the ECS commitment to the project. Pressure on the ECS was reduced through a project variation that:
  - 12.1. allowed the non-PWER contribution to be shared between the landowner and the ECS for yet to be committed projects
  - 12.2. extended the project time frame
  - 12.3. allowed for project management to be an in-kind contribution in lieu of employing a part time coordinator.
13. The original project expired on 31 December 2022, with a total of 187.5km of fencing having been completed. Some projects remained incomplete, predominantly in Northern Hawke's Bay where adverse weather had disrupted or delayed fencing.
14. Following Cyclone Gabrielle, PWER fund administrators supported a proposal to allow the project underspend to fund repairs to project fences lost or damaged during Cyclone Gabrielle. A new funding agreement was signed July 2023.
15. The extended project was officially closed 30 June 2024 with repairs to / replacement of 15.2km of fencing.

## **Discussion**

### **Initial project selection**

16. The initial projects were planned ECS fencing deemed to be shovel-ready (or close to) following the March/April 2020 Covid-19 lockdown.
17. In addition, these and any subsequent projects had to demonstrate that fencing was 'above and beyond' any minimum requirements set by current and pending stock exclusion regulation. This included the exclusion of all classes of stock, wider setbacks with opportunities for planting and/or the retirement of marginal land, or land with a high biodiversity value.
18. A total of 82 projects were approved:
  - 18.1. Northern Hawke's Bay (19)
  - 18.2. Mid Hawke's Bay (29)
  - 18.3. Central/Southern Hawke's Bay (34).

### **Post cyclone remedial projects**

19. Of the original 82 projects, 21 applied for further assistance toward repairing/replacing fences damaged during Cyclone Gabrielle. In addition to meeting the above requirements, applicants were required to sign a declaration stating that the fences were not eligible for an insurance payment, and that the MPI cyclone recovery grant had already been claimed and exhausted.

20. **Project KPIs**

	<b>Planned</b>	<b>Actual</b>
Total budget	\$4.2 million	\$4,133,316
Total fencing	195km	187.5km
Total area treated	100ha	841.6ha
Person-hours worked	60,000 hours	52,237 hours
Project duration	2 years	4 years

21. **Other figures**

Catchment Management staff involved	11
Quarterly / Milestone reports produced	15
Project variations negotiated	3
Project audits completed	2
project inspection/claims completed	200 +
PWER project advisors	4

**Successes**

22. Scale and pace of the work achieved, with potential for further environmental outcomes.
- 22.1. *The project enabled the completion of fencing that would have otherwise taken considerably longer. Newly retired riparian margins have created more opportunities for riparian planting.*
23. Jobs for nature outcomes (employment creation and skills development).
- 23.1. *In addition to the employment metrics collected, we heard from contractors who had trained new employees and retained seasonal staff to meet the demand for project fencing. We are also aware of individuals who were employed by fencing contractors when their jobs were disrupted by Covid-19*
24. Our ability to pivot and add value to the original proposition.
- 24.1. *By leveraging additional actual and in-kind funding we were able to extend the number and type of projects funded. While predominantly a riparian fencing project, we were also able to fund the retirement of high value wetlands and indigenous bush remnants.*

**Challenges/lessons**

25. Frantic project planning followed by a protracted approval process.
- 25.1. *Tight initial timeframes and urgent requests for further information were followed by an uncertain and lengthy decision-making process. This was frustrating for staff and created budgeting issues which affected other work programmes.*
26. Project administration and reporting requirements.
- 26.1. *Planning and managing the budget and reporting requirements for over 80 individual projects was complex, time consuming, and required a coordinated staff effort. Catchment and Biodiversity team staff were well supported by our HBRC GIS specialists and accountants.*

**Decision-making considerations**

27. Staff have assessed the requirements of the Local Government Act 2002 in relation to this item and have concluded that, as this report is for information only, the decision-making provisions

do not apply.

**Recommendation**

That the Environment and Integrated Catchments Committee receives and notes the *Public Waterways & Ecosystem Restoration Fund Project Report*.

**Authored by:**

**Warwick Hesketh**  
**Principal Advisor Catchment Management**

**Jolene Townshend**  
**Manager Catchment Operations**

**Approved by:**

**Iain Maxwell**  
**Group Manager Integrated Catchment Management**

**Attachment/s**

There are no attachments for this report.

**Hawke's Bay Regional Council**  
**Environment and Integrated Catchments Committee**

**11 September 2024**

**Item 11**

**Subject: Update on the IRG flood control and drainage programme**

**Reason for report**

1. This item provides the committee with an update on the IRG programme of work, including the current status of all projects within this programme. It is not intended to be a comprehensive review of all activities that have been undertaken, however, it provides a formal update to the committee.

**Background**

2. In the 2020 Budget, Cabinet agreed to provide a \$3 billion investment in infrastructure to support New Zealand's economic recovery as part of the 11 May Covid-19 Response and Recovery Fund.
3. New Zealand River Managers Special Interest Group collectively put forward an application to this fund for a programme of work associated with flood risk and climate resilience across New Zealand.
4. This bid was successful, resulting in total programme funding of \$30m for Hawke's Bay Regional Council, including co-funding requirements.
5. As a result of Cyclone Gabrielle delaying the programme in June 2023, Council staff commenced negotiations on a variation to the Kanoa funding agreement to extend the funding timeframes and modify the agreed programme.

**The IRG programme**

6. The original approved IRG programme consists of 4 main pillars as identified in the table below, together with co-funding requirements.

Work Programme	Programme Cost	Co-Funding (HBRC)	Funding	Status
1. Heretaunga Plains Flood Control Scheme	Up to \$20,000,000	Up to \$7,200,000	Up to \$12,800,000	Modified Programme
2. Wairoa River Scheme – River Parade Scour Protection	Up to \$1,000,000	Up to \$360,000	Up to \$640,000	Completed
3. Upper Tukituki Flood Control Scheme – SH50 Bridge	Up to \$1,000,000	Up to \$360,000	Up to \$640,000	Completed
4. Upper Tukituki Flood Control Scheme – Gravel Extraction	Up to \$8,000,000	Up to \$2,880,000	Up to \$5,120,000	Ongoing
<b><i>Crown funding total: up to \$19.2m      Local contribution: \$10.8m</i></b>				

**Project 1: Heretaunga Plains Flood Control Scheme (Levels of Service) - \$20m**

7. The original programme of work sought to increase the rate at which works were complete to improve the level of service provided by the scheme to a 1 in 500-year flood level of protection, including allowances for climate change and sea level rise, together with improved resilience for the higher velocities anticipated from the increased flood flows.

8. This funding was proposed to deliver 5 upgrades of the approximately 42 required to complete the level of service upgrade process.
9. HBRC co-funding of \$7.2 million was required to match IRG funds of \$12.8 million.
10. In conjunction with the extension of the funding timeframes associated with the Kanoa funding contract, the original programme of work has been modified to incorporate predominantly enabling works for potential future upgrades and/or scheme review related projects.

#### **Project 2: Upper Tukituki Gravel Extraction Flood Control Scheme - \$8 million**

11. Gravel aggradation across this scheme has been an area of concern for the last decade.
12. This project involves the removal of 800,000m<sup>3</sup> gravel from Central Hawke's Bay rivers to maintain existing nameplate capacity of 1:100 level of protection from Upper Tukituki scheme.

#### **Project 3: Upper Tukituki Flood Control Scheme SH50/Waipawa Erosion - \$1 million**

13. The left bank of the Waipawa river immediately upstream of SH50 bridge has eroded significantly over the past five years.
14. In addition to stabilizing the river also provided a degree of protection works for the southern approach to NZTA's SH50 bridge.
15. This project received co-funding from Waka Kotahi to the value of \$300,000.

#### **Project 4: River Parade Scour Protection, Wairoa - \$1 million**

16. The Wairoa River had gradually undermined the embankment immediately south of the Ferry Hotel. This had in turn compromised Wairoa District Council (WDC) water assets and, more recently, Carroll Street and River Parade.
17. This project provided steel sheet-piled erosion protection works on the left bank of the Wairoa River.
18. This project received co-funding from Waka Kotahi to the value of \$180,000.

#### **Social procurement**

19. In keeping with the purpose of the Covid-19 Response and Recovery Fund as an economic stimulus following lockdown, key conditions of the funding agreement with the Government stipulated the requirement to achieve social procurement outcomes.
20. Acceptable social procurement outcomes include:
  - 20.1. New employment
  - 20.2. Preservation of jobs
  - 20.3. Redeployment of workers
  - 20.4. Supplier diversity
  - 20.5. Skills and training
  - 20.6. Environmental responsibility
  - 20.7. Investment toward more productive, sustainable and inclusive economy.
21. The realisation of these outcomes occurs predominantly in the construction phase of the project.

#### **Programme funding timeframes**

22. The original funding agreement committed to funding a 3-year programme of work commencing on the date of execution of the agreement 20 November 2020. The original

timeframe deadline for funding for this programme of work was 20 November 2023.

23. Kanoa Regional Economic Development and Investment Unit recognised the significant impact that Cyclone Gabrielle has had on HBRC's programme and generally has a desire to see the programme completed and so agreed in principle to an extension to this funding timeframe.
24. A variation to the funding contract to extend the funding deadline to 30 June 2025 has been successfully completed. This extension includes a modified programme for the Heretaunga Plains Flood Control Scheme component of the work programme.

#### **Current programme status**

25. The Wairoa River Protection and SH50 Waipawa River Erosion Protection projects were completed in September 2021 and September 2022 respectively.
26. In addition to an extension to the funding deadline, HBRC requested a change to the programme to undertake a number of enabling tasks for future Level of Service Upgrade projects.
27. The revised programme consists of predominantly enabling works. The summary below provides project specific information on the proposed variation to programme.
28. The Variation was approved by Kanoa on 13 May 2024.

#### **Heretaunga Plains Flood Control Scheme Status Update**

##### **Moteo stopbank upgrade**

29. This project is part of the original programme. This project has a completed detailed design and all tender documentation is completed for the original design. Consenting was due to be completed by March 2023 with construction completed by November 2024.
30. The revised programme includes advancing the project to fully consented status, and primarily includes completing a Cultural Impact Assessment to support the lodging of the Earthworks Consent Application with Hastings District Council. It is envisaged that consents will be achieved by March 2025.
31. Findings from the Heretaunga Scheme Flood Scheme Review and Independent Review will be assessed to determine what if any modifications to the original design are required and associated consent, prior to going to construction.
32. The project team are actively working with Mana Whenua to progress this project. However, capacity constraints may impact the ability for Cultural Impact Assessments to be delivered in the project timeframes.

##### **Omaranui stopbank upgrade**

33. This project is part of the original programme. This project has a detailed design completed to 60%. Consenting was due to be completed by March 2023 with construction completed by November 2024.
34. The revised programme includes advancing the project to fully consented status, and primarily includes completing a Cultural Impact Assessment to support the lodging of an Earthworks Consent Application Hastings District Council. It is envisaged that consents will be achieved by March 2025.
35. Findings from the Heretaunga Scheme Flood Scheme Review and Independent Review will be assessed to determine what if any modifications to the original design are required and associated consent, prior to going to construction.
36. The project team is actively working with mana whenua to progress this project. However, capacity constraints may impact the ability for Cultural Impact Assessments to be delivered in the project timeframes.

### **Clive River erosion protection (Farndon Road)**

37. This project is part of the original programme. Detailed design was due to be completed by September 2023 with construction completed by March 2024.
38. The revised programme includes completion of detailed design and construction of river erosion protection, and proposes that detailed design reaches completion in September 2024, with construction due to be completed by June 2025.
39. Findings from the Heretaunga Scheme Flood Scheme Review and Independent Review, if available, will be assessed to determine what if any modifications to the original design are required and associated consent, prior to going to construction.
40. This project is progressing with detailed design on the preferred solution well underway.
41. Additionally, the project team is working with mana whenua and a cultural impact assessment is being completed to support the lodging of resource consent for the project.

### **East Clive stopbank upgrade**

42. This project is part of the original programme. Detailed design was due to be completed by August 2023 with construction completed by June 2024.
43. The revised programme includes advancing the project to fully consented status and advancing the design to a level sufficient to support the consenting process. Due to the complex nature of the consenting requirements for this project, it is envisaged that consents will be achieved by June 2025.
44. This project is progressing with the design scope now modified and underway to support the consent process.
45. A cultural impact assessment and an ecological assessment are being completed to support the lodging of resource consent for the project.
46. Findings from the Heretaunga Scheme Flood Scheme Review and Independent Review will be taken into account when finalising the design associated with this project.

### **Upper Tukituki Flood Control Scheme – gravel extraction**

47. This project is part of the original programme.
48. Gravel extraction activities under the IRG programme were largely curtailed immediately following the cyclone, as contracting resource was required to assist with the rapid rebuild of stopbanks across the region. (The rapid rebuild did involve the extraction of 250,000m<sup>3</sup> of gravel for rebuild activities, a proportion of which came from Central Hawke's Bay Rivers.)
49. Despite cyclone-related delays to extraction, Tranche 3 of extraction has been completed with the programme targeted volume of 800,000m<sup>3</sup> of extraction reached, at a cost of approximately \$6m, well below the budgeted amount.
50. Tranche 4 has successfully been tendered with contracts awarded targeting the extraction of 59,500m<sup>3</sup> from reaches either side of the State Highway bridge in Waipawa and Makaretu River.
51. Work has commenced on Tranche 4 with 16,000m<sup>3</sup> already extracted from the Waipawa River. Once river levels drop to a satisfactory level the extraction of the remaining 43,000m<sup>3</sup> will be completed.
52. At least one further tranche of extraction is planned with a view to maximising the total volume extracted utilising all remaining available funding. The volume to be extracted in Tranche 5 is currently being finalised and is targeting extraction on reaches of the Mangaonuku Stream and Tukipo River.
53. It is likely that funding would have been fully consumed by March 2025.



### **Recommission the Maraenui Stopbank**

54. This project is not part of the original programme.
55. This project is proposed to recommission the Maraenui Stopbank (previously decommissioned when the current Brookfields upper and lower stopbank was constructed) in order to provide a secondary level of protection from flooding to residential areas of Napier.
56. The work will involve investigation, high level design and construction. It is envisaged that construction will be completed by June 2025.
57. Geotechnical investigation and design support has been tendered and the contract awarded.
58. The geotechnical investigations have been completed with the preliminary design now underway.
59. The project team are working with mana whenua and a cultural impact assessment is being completed to support the delivery of this project.

### **Investigations to compile a catalogue of available borrow material**

60. This project was not part of the original programme.
61. Work completed pre- and post-cyclone has highlighted that, although there is an abundance of silt in the region, not all of it is suitable for construction purposes. Material availability will be a critical element of all successful future flood resilience projects.
62. This proposal involves completing geotechnical investigation in all reaches of the Heretaunga Plains Flood Protection Scheme, and permanent silt deposit sites created by the Silt Task Force to identify the quality and quantity of available borrow material throughout the scheme.
63. This will enable the volume of suitable available borrow material to be quickly understood and targeted for all future stopbank construction projects.
64. This work is currently being scoped, with an understanding on the extent of available information also being developed.
65. It is envisaged this work will be completed by April 2025.

### **Investigation and design for future upgrade works**

66. This project was not part of the original programme.
67. This proposal involves completing geotechnical investigation and detailed design for the following high priority reaches:
  - 67.1. Raupare Upper and Raupare Lower
  - 67.2. Chesterhope Upper
  - 67.3. Brookfields Lower
  - 67.4. Pākōwhai Park.
68. The project team are currently work with the different mana whenua groups associated with each of these projects to get cultural impact assessments completed to help inform the detailed design process and support obtaining resource consent in the future.
69. Geotechnical investigation and design support for Brookfields Lower has been tendered and will soon be awarded.
70. Tendering of the geotechnical investigation and design support for the remaining projects will be staged with the tender process completed and contracts awarded for all projects by October 2024
71. It is envisaged this work will be completed by June 2025.

## Undertake a partial Plan Change to the Hastings District Council District Plan

72. This project was not part of the original programme, and at Kanoa's request has been removed from the programme variation.
73. The IPMO is advancing this work outside of the IRG programme to support land category and future stopbank related projects.
74. Work has commenced on this initiative with assessments of both ecological effects and landscape visual effects underway to support the lodgment of the private plan change.
75. An engagement plan has been developed identify all mana whenua partners and key stakeholders with initial engagement ready to commence.

## Programme summary

76. This programme is summarised below.

Project	Q1 24	Q2 24	Q3 24	Q4 24	Q1 25	Q2 25
Upper Tuki Tuki Flood Control Scheme - Gravel Extraction	Completed					
Ngatarawa	Completed					
Progress Moteo to fully Consented stage	Completed					
Progress Omarunui to fully Consented stage	Completed					
Continue with Farndon Road including Construction	Completed					
Continue with East Clive to pre construction stage	Completed					
Recommission Maraenui Golf Course Stopbank	Completed					
Borrow Catalogue for Heretaunga Plains Flood Control Scheme	Completed					
Geotechnical Assessment and Design for Raupare Upper and Lower	Completed					
Geotechnical Assessment and Design for Chesterhope Upper	Completed					
Geotechnical Assessment and Design for Brookfields Lower	Completed					
Geotechnical Assessment and Design for Pakowhai Park	Completed					

## Decision-making process

77. Staff have assessed the requirements of the Local Government Act 2002 in relation to this item and have concluded that, as this report is for information only, the decision-making provisions do not apply.

## Recommendation

That the Environment and Integrated Catchments Committee receives and notes the *Update on the IRG flood control and drainage programme* staff report.

## Authored by:

**Jon Kingsford**  
**Manager Regional Projects**

**Thomas Petrie**  
**Programme Manager Protection & Enhancement Projects**

## Approved by:

**Chris Dolley**  
**Group Manager Asset Management**

## Attachment/s

There are no attachments for this report.

**Hawke's Bay Regional Council**  
**Environment and Integrated Catchments Committee**  
**11 September 2024**

**Subject: Update on the North Island Weather Events resilience programme**

**Reason for report**

1. This item provides the committee with an update on the status of all projects within the North Island Weather Events (NIWE) flood resilience programme.

**Background**

2. The Crown and Hawke's Bay Regional Council (HBRC) entered into the North Island Weather Events (2023) – Hawke's Bay Crown Funding Agreement on 10 October 2023 (the NIWE Agreement).
3. The NIWE Resilience Programme consists of several initiatives to provide flood protection schemes to multiple communities across Hawke's Bay and it also incorporates upgrades to both pumpstations and stopbanks associated with existing schemes, as well as Telemetry upgrades and Scheme Reviews.
4. The packages of work funded through this agreement are highlighted below.

Severely Affected Land Areas	Crown Funding	HBRC Funding	Total
Wairoa	\$70,000,000	0	\$70,000,000
Whirinaki	\$8,300,000	\$2,750,000	\$11,050,000
Waiohiki	\$7,500,000	\$2,500,000	\$10,000,000
Ohiti	\$7,500,000	\$2,500,000	\$10,000,000
Pākōwhai	\$37,600,000	\$12,400,000	\$50,000,000
Pōrangahau	\$9,800,000	\$3,200,000	\$13,000,000
<b>Sub Total</b>	<b>\$148,200,000</b>	<b>\$25,850,000</b>	<b>\$174,050,000</b>
Telemetry	\$3,800,000	\$1,200,000	\$ 5,000,000
Pumpstation Upgrades	\$22,500,000	\$7,500,000	\$30,000,000
Scheme Reviews	\$2,300,000	\$700,000	\$ 3,000,000
Rapid Repair – Level of Service works	\$22,500,000	\$7,500,000	\$30,000,000
<b>Total</b>	<b>\$191,800,000</b>	<b>\$40,200,000</b>	<b>\$232,050,000</b>
Havelock North – Cat 2 HDC delivered	\$7,500,000	\$2,500,000	\$10,000,000
<b>Total (incl Havelock North)</b>	<b>\$199,300,000</b>	<b>\$42,700,000</b>	<b>\$242,050,000</b>

\*For the purposed of this table the value for Tangoio (now Cat 3) has been excluded from these values. Values have been rounded to nearest \$100,000.

5. Crown Infrastructure Partners (CIP) is the appointed Administrator to our Crown Funding agreement and are mandated to distribute and manage the funding support under the NIWE Agreement and the Local Government Flood Resilience Co-Investment Fund.
6. The Crown announced further funding to assist with the NIWE Capability Funding (Go-Fast funding) which has provided a further \$2,180,000 of funding to Hawke's Bay Regional Council.
7. The Cyclone Recovery Capability Fund was established through Budget 2024 to speed up the delivery of critical recovery functions in areas impacted by the 2023 North Island Weather Events (NIWE). Up to \$20 million was available to provide councils in affected regions with

additional capability to speed up delivery of critical recovery functions including voluntary buyouts, flood protection works, landslip remediation and local transport infrastructure.

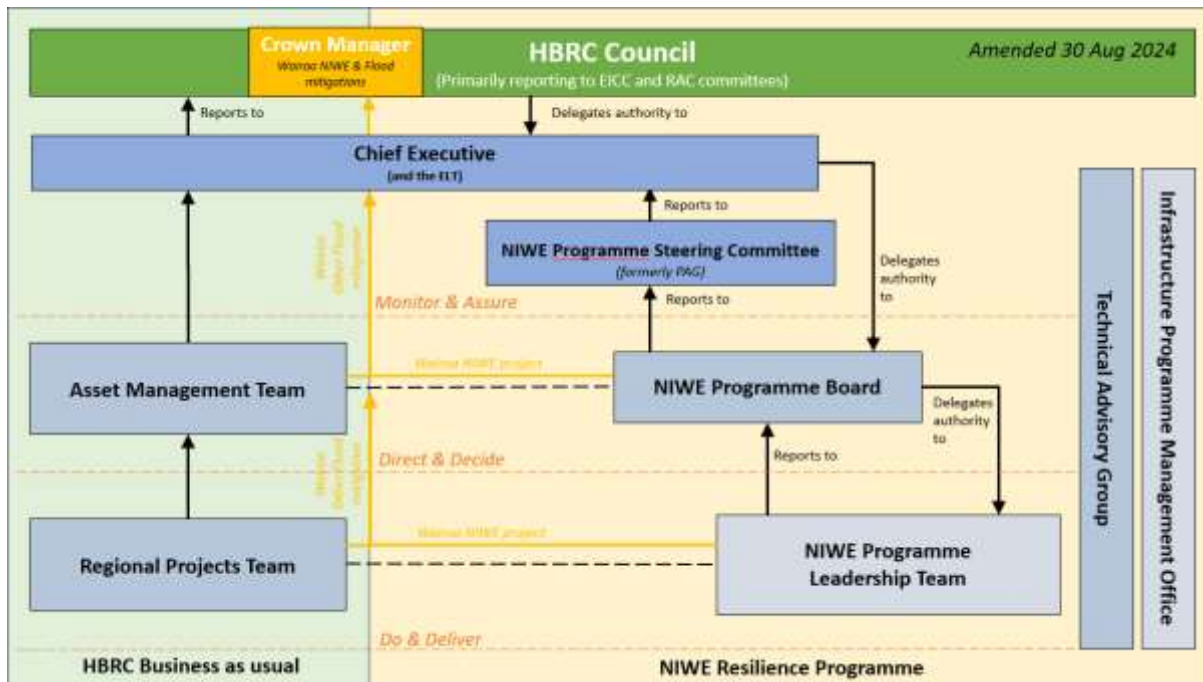
8. The Cyclone Recovery Unit (CRU) received 13 applications for 57 separate proposals. Applications were assessed against the following criteria:
  - 8.1. The extent to which the proposal will speed up identified recovery activities
  - 8.2. The benefits of the proposal and the scale of benefits
  - 8.3. The ability to deliver, based on providing information about the available capability and/or resource that can be readily procured if funding was made available.
9. HBRC was granted \$2,180,000 across 6 initiatives from this fund, including one specifically for Havelock North (Mangarau) Streams of \$150,000. HBRC was declined 2 initiatives totaling \$180,000 including one for Havelock North totaling \$50,000.
10. The grant is valid for the period from 19 August 2024 through to 30 June 2025.
11. There are some conditions on this funding and pre-approvals required before this is released.

### **IPMO Update**

12. The Infrastructure Programme Management Office is now set up and the team have moved into their new premises across the road from the main Hawke's Bay Regional Council building on the ground floor of 180 Dalton Street. The team has 30+ roles filled across both the projects and programme office team. There are a few roles still to recruit or currently recruiting which is ongoing.
13. The NIWE programme is driving significant organisational change by challenging existing processes and necessitating enhancements to meet current needs. This is affecting resource allocation and increasing the need for collaboration across Council.
14. The reporting needs of the NIWE programme are significant, with various stakeholders and partners requiring various reporting on a regular and an ad hoc basis. This is having a significant impact on the IPMO team and we have been reevaluating resources as a result.
15. All reporting requirements have been met to date which have resulted in significant effort from the IPMO and wider team to meet demands.

### **Programme Governance and Assurance**

16. Since our last update to this Committee and following discussions with Crown Infrastructure Partners (CIP), it has been agreed to amend the NIWE programme governance framework to replace the Programme Assurance Group with a Programme Steering Committee which is to include Chief Executives of both HBRC and CIP, a senior level representative from HBRC and CIP and an independent assurance member providing oversight expertise.
17. We are in the process of updating the Terms of Reference for these groups and in turn looking at the various delegations and decision making within the current Council approval, specifically with regard to the various responsibilities, accountabilities, consultation required and information and engagement required in terms of the NIWE programme delivery.
18. Below is the amended Governance structure for Council reference, including the Crown Manager's position with regard to the NIWE Wairoa project and Wairoa flood mitigations following his appointment. This is with the Crown Manager for review.



### NIWE Programme update

19. The project teams are progressing each project in a challenging environment to work at pace.
20. The Crown appointed Lawrence Yule as Crown manager for the Wairoa Flood mitigation work. Work has effectively halted in Wairoa while Lawrence is initiated into the governance position, and clarity is given to both WDC, HBRC and the Crown as to the roles and responsibilities of the Crown Manager and how this aligns with programmes of work and requirements.
21. In designing of all mitigations, an emerging risk has been identified by in the challenges associated with factoring in climate change into the modelling. This has resulted in consequential flooding impacts and further assessment is being sought.
22. Timeliness of securing land access agreements continues to be a risk across all NIWE projects, specifically Māori reservation land identified in both Wairoa and Pōrangahau. HBRC is working with property advisers to enable to progress and solution options.
23. The Programme team continues to progress two procurement initiatives for stopbanks and pumpstations. The Request for Proposal (RFP) Stopbank Preferred Supplier list (c\$120m) has closed with 25 responses received. These are being evaluated and due for decision circa end of August. The Request of Interest (ROI) for Pumpstations Design & Build is out to market closing 28 August 2024. A Probity Officer has been appointed for both of these significant procurements.
24. The Programme team has been working to improve reporting across projects and the programme to ensure it is timely and effective.
25. Upcoming this month are:
  - 25.1. Evaluation of a List of Preferred Suppliers for Stopbank Construction
  - 25.2. Continued landowner negotiations across first 3 projects
  - 25.3. Commence pumpstation design-build procurement process
  - 25.4. Continued design processes for first 3 projects
  - 25.5. Recommence Wairoa Engagement and Options assessment under Crown Manager direction

25.6. Submission of Project Delivery Plans (PDPs) for submission to CIP and then Ministers. These are detailed delivery plans submitted following preliminary design which outline the scope of the proposed works, cost and time milestones and agreed project schedules.

26. To 31 July 2024:

Budget	Approved budget	Cost to date	Forecast cost to complete	Forecast final cost	Variance
242,050,000	*\$44,150,000	6,330,086	241,829,914	248,160,000	6,110,000
	*Co-Funding approved by HBRC				

\$6.11m variance is the due to the current forecast cost to complete the Whirinaki project which includes the roading upgrades not currently funded by NZTA.

27. See attached Programme Cost Summary for summary costings by project.

28. See below table for overall project status and Project Delivery Plan status.

Project	Stage	Overall	PDP Status
Wairoa	Initiation	Off-track	Drafting – est. submission <b>Dec 24</b>
Whirinaki/Pohutukawa Drive	Planning	Major concerns	Reviewed by CIP Currently on hold pending NZTA discussions
Waiohiki	Planning	On track	With CIP for approval > CRU
Omāhu/Ohiti Road	Planning	Minor concerns	With CIP for approval > CRU
Pākōwhai	Initiation	Minor concerns	Draft sent to CIP for commentary est. submission <b>Oct 24</b>
Porangahau	Initiation	Major concerns	Drafting – est. submission <b>Oct 24</b>
Telemetry	Planning	Minor concerns	With CRU > then to Ministers for sign off
Pump Station Upgrades Required	Planning	On track	Drafting – est. submission <b>Dec 24</b> once D&B tenders received
Scheme Reviews	Planning	On track	Drafting – est. submission <b>Oct 24</b>
Rapid Repair Level of Service (LOS)	Pre-project	Minor concerns	Not yet started – est. submission <b>Dec 24</b>
Havelock North	Initiation	n/a	With CRU > then to Ministers for sign off

### Project updates

29. Projects within the IPMO programme continue to be progressed as rapidly as possible and are following best practice in tasks planned and undertaken.
30. Where possible, tasks are being brought forward and/or run in parallel. For example, geotechnical investigations, survey of project areas and ecological investigations are being progressed earlier than usual to enable project timeframes to be condensed as much as possible.

### Land Category Projects

#### Wairoa

31. Wairoa engagement process slowed due to severe weather event at the end of June, while we regrouped and understand the impacts of legal review into floods and to allow community to recover before re-engaging.
32. Steve Fabish, Senior Project Manager has started and begun working with the project team and build relationships.

#### Project progress

33. Due to the June rain event, the project is tracking two months behind schedule.

34. We now have a dedicated Senior Project Manager based in Wairoa, Steve Fabish. Steve is well known in the district. He is joined by Engagement Advisor and Wairoa local, Sue Wilson.
35. A Stakeholder Group meeting was held on 15 August and two solutions have been accepted to take to the Tripartite, who are meeting in early September.
36. The Government-appointed Crown Manager has been announced as Lawrence Yule.
37. Identification of multiple parcels of Māori Reservation Land in each Wairoa option may present significant challenge due to the cultural and historical interest in these sites.
38. Construction including enabling works scheduled to start October 2025.

#### **Engagement**

39. A comprehensive Comms and Engagement plan has already been developed by HBRC and includes a mana whenua and landowner engagement action plan. Now the two solutions have been confirmed at the Stakeholder Group meeting on 15 August, we will incorporate specifics into that plan and share with the Tripartite and Lawrence Yule. Sue Wilson is working with the HBRC teams based in Wairoa and Napier and will manage the engagement activities in Wairoa. A project website hub is in development.

#### **Whirinaki**

##### **Project progress**

40. This project is experiencing a slight delay as landowner negotiations continue.
41. Site investigations around the urupa are in progress.
42. The project team continues to partner with Petane Marae on progressing a Cultural Impact Assessment for the project area.
43. Challenges with estimated construction costs due to the impact of level of service and climate changes factors on design. The team is working through these with urgency.
44. Construction including enabling works is scheduled to start November 2024.

##### **Engagement**

45. Regular newsletters (June, July) have been sent to the community and Petane Marae. A community meeting has been rescheduled for 12 September. The project website hub can be found on our website.

#### **Waiohiki**

##### **Project progress**

46. This project is on track.
47. Landowner negotiations continue.
48. Flood modelling has been completed and assessment of secondary affects now underway. This is still in preliminary design stage.
49. Stream realignment and planting plan is being co-designed with mana whenua.
50. Enabling works have been tendered and we are currently evaluating tenders received. Enabling works are scheduled to begin in September 2024.
51. Construction is scheduled to start February 2025.
52. The consent application has now been submitted.

##### **Engagement**

53. Regular newsletters (June, July) have been sent to the Waiohiki community, include hapū. The most recent newsletter introduced upcoming enabling works. Further communication will

follow to share details of the plan and updates as these works progress. The project team continue to partner with mana whenua on the project. The project website hub can be found on our website.

## **Ohiti**

### ***Project progress***

54. This project is experiencing some delays as landowner negotiations continue.
55. Final modelling has been completed and will feed into the upcoming preliminary design.
56. Project team is working with Hastings District Council and Unison to identify any impacts on assets.
57. Stream works are scheduled to be undertaken in October 2024.
58. Construction including enabling works is scheduled to start March 2025.

### ***Engagement***

59. The Ōhiti community, including 2C and Te Piringa Hapū, has received a July newsletter and a community meeting is planned for 10 September. The project team continues to meet one-on-one with affected landowners as needed. The project website hub can be found on our website.

## **Pākōwhai**

### ***Project progress***

60. This project is on track.
61. Site walkovers have identified a number of areas requiring further investigation e.g. existing businesses and infrastructure within the stopbank alignment, and previously unknown potential contaminated land sites.
62. The team is reviewing options for overdesign. This will lead to some delays to completion of concept design while the above are assessed and understood.
63. Coming up are borrow site investigations, desktop ecology assessments, geotech investigations and continued development of the concept design.
64. Construction including enabling works are scheduled to start September 2025.

### ***Engagement***

65. A two-day site walkover with landowners on proposed stopbank footprint was undertaken in late July with affected landowners. The outcomes of this walkover will be reviewed prior to finalising design. The project team, engineers and comms team attended. The comms team also met with Tamatea Pōkai Whenua to share project information. A further meeting with other affected landowners is taking place on 21 August.

## **Pōrangahau**

### ***Project progress***

66. This project is on track.
67. Reviews of the updated technical information following the topographical surveys has highlighted a number of areas with restricted access, and has resulted in a refined design and confidence to move forward.
68. Community engagement is now planned with all stakeholders discuss raising and/or relocation of properties (due September).
69. The project team has met with Ngāti Kere Hapū Authority on 25 August to discuss the marae and Kaumatua Flats.



- 70. Updated modelling has been done to reflect amended climate change scenario. We are also working with mana whenua to establish a Cultural Impact Assessment writer.
- 71. The move from Category 2A to 2C will depend on the solution being generally agreed to by the community and we envisage this will happen in the next couple of months.
- 72. Construction including enabling works is scheduled to start September 2025.

### **Engagement**

- 73. Regular newsletters (June and July were the latest) have been sent to the Pōrangahau community, including the marae, Māori committee, Central Hawke's Bay District Council. The project website hub has been updated and regular meetings are held with the CHBDC Comms team and fortnightly meetings held with Recovery Manager covering progress of the project. For the next month or so, individual and small group meetings will be held as noted above with directly affected landowners.

### **Telemetry projects**

#### **Project progress**

- 74. This project is on track.
- 75. The team has identified more than 30 critical sites for upgrade following the Horrell Report and further investigations by the Hydrology team.
- 76. The team has also identified critical acceleration opportunities and potential efficiencies through specialist suppliers and standardisation of equipment.
- 77. A draft resource capacity plan has been developed, considering both internal and external resources, and the procurement plan is currently being developed with a focus on streamlining, enabling the implementation team to act quickly.
- 78. The team is knowledgeable and energetic, and their positive attitude has significantly contributed to kicking off this project.

#### **Engagement**

- 79. A webpage for telemetry is being constructed.

### **Pumpstation upgrades**

#### **Project progress**

- 80. This project is on track.
- 81. The pump station upgrade project continues to make progress with site investigations and reports continuing, including ecology and geotech.
- 82. The request for interest in the design-build tender has been released on Government Electronic Tender System (GETS) and has now closed with 10 responses. These are in the process of being evaluated.
- 83. Construction including enabling works is scheduled to start April 2025.

#### **Engagement**

- 84. A webpage for the pump station project has gone live and information about the Pākōwhai pump station has been shared with the Pākōwhai community in the last newsletter.

### **Scheme reviews**

#### **Project progress**

- 85. This project is on track.
- 86. We have 3 packages of Scheme Review work with 18 Scheme Reviews in Total.

87. Procurement process underway for consultants being appointed. The tender evaluations have now been completed and appointments will be made early September 2024.
88. Commencement of work is expected to start late September 2024.

### ***Engagement***

89. Engagement plan is under review currently.

### **Repair rebuild Level of Service Upgrades**

#### ***Project progress***

90. Site prioritisation to be carried out to be able to determine the order in which the projects can be executed. Site prioritisation to include four major source of information which are the following:
  - 90.1. Existing Heretaunga Plains multi-criteria analysis which incorporates asset attributes and socio-economical assessment
  - 90.2. Cyclone Gabrielle stopbank damage sites information
  - 90.3. Scheme review information for Heretaunga Plains and Upper Tukituki schemes which includes current performance of the scheme and its assets
  - 90.4. Multi-criteria analysis to be developed for the Upper Tukituki scheme area in alignment with the existing Heretaunga plains multi-criteria analysis.
91. Based on the site prioritisation the top 10 sites are to be selected to progress further for pricing and eventually physical works. The details of physical works to be captured in a site-specific format and not as part of this scope.
92. Site prioritisation of the top 10 sites is to be completed by 1 December 2024 with regular check ins and key milestones discussed.

### **Telemetry projects**

#### ***Project progress***

93. This project is on track.
94. The team has identified more than 30 critical sites for upgrade following the Horrell Report and further investigations by the Hydrology team.
95. The team has also identified critical acceleration opportunities and potential efficiencies through specialist suppliers and standardisation of equipment.
96. A draft resource capacity plan has been developed, considering both internal and external resources, and the procurement plan is currently being developed with a focus on streamlining, enabling the implementation team to act quickly.
97. The team is knowledgeable and energetic, and their positive attitude has significantly contributed to kicking off this project.

### ***Engagement***

98. A webpage for telemetry is being constructed.

### **Havelock North**

99. This project is being delivered by Hastings District Council and Crown contract administered via HBRC and Crown Infrastructure Partners.

#### ***Project progress***

100. This project is on track.

101. Work is progressing with property rights, modelling, procurement of technical resource, supporting technical works (Arch, cultural).
102. Procurement is underway for a Design Partner, this should be achieved by mid August.
103. Stage 1 Construction is intended for Oct/ Nov 2024 with enabling works, procurement plan being drafted.
104. Tonkin and Taylor Optioneering Report was completed in December 2023, a further scoping study completed in April 2024, modelling underway to confirm extent of upgrades to meet 1% AEP objective.
105. Consultation is ongoing. The project team has held one-to-one meetings and community meetings in 2023, with a 2C-specific meeting held in December 2023, followed by further one-to-ones and a community drop-in in May 2024. A very successful meeting was held on 23 July.
106. The Property Group has given high level guidance on the tools available regarding legal access and land acquisition.
107. The project team has commissioned several field studies to support the consenting process (archaeological report, ecological report, survey). More progress will be made once the OiC has been confirmed. A planning firm, Stradegy Ltd, is offering specialised support for the project through HBRC for the OIC, and HDC currently procuring consenting services to progress Stage 1 designs.

#### **Decision-making process**

108. Staff have assessed the requirements of the Local Government Act 2002 in relation to this item and have concluded that, as this report is for information only, the decision-making provisions do not apply.

#### **Recommendation**

That the Environmental and Integrated Catchments Committee receives and notes the *Update on the North Island Weather Events resilience programme* staff report.

#### **Authored by:**

**Jess Bennett**  
Programme Finance & Controls Manager

**Sarah Cameron**  
Team Leader - IPMO Communications & Engagement

**Jon Kingsford**  
Manager Regional Projects

#### **Approved by:**

**Chris Dolley**  
Group Manager Asset Management

#### **Attachment/s**

There are no attachments for this report.