

**Water and Land Working Party**  
**Tuesday 1 March 2022 at 9:30am**

**AGENDA**

## Water and Land Working Party Agenda

Meeting to be held in the Remotely via MS Teams link  
on Tuesday 1 March 2022, commencing at 9:30am

**Please note: working parties and working groups carry NO formal decision-making delegations from council. The purpose of the working party/group is to carry out preparatory work and discussions prior to taking matters to the full council for formal consideration and decision-making. Working party/group meetings are open to the public to attend (unless there are specific grounds under LGOIMA for the public to be excluded).**

### MEMBERSHIP OF THE WATER AND LAND WORKING PARTY

Chairperson, Councillor Justin Blaikie

Councillor Jack Crow	Councillor Amy Macdonald	Councillor Marty Robinson
Councillor Joce Yeoman	Ex-Officio Penny Smart	TTMAC Representative Janelle Beazley
TTMAC Representative Georgina Connelly	TTMAC Representative Waimarie Kingi	TTMAC Representative Mira Norris
TTMAC Representative Alan Riwaka		

### KARAKIA

### RĪMITI (ITEM)

Page

#### 1.0 NGĀ MAHI WHAKAPAI/HOUSEKEEPING

#### 2.0 NGĀ WHAKAPAHĀ/APOLOGIES

#### 3.0 NGĀ WHAKAPUAKANGA/DECLARATIONS OF CONFLICTS OF INTEREST

#### 4.0 REPORTS

4.1	<a href="#">Record of Actions – 8 December 2021</a>	3
4.2	<a href="#">Receipt of Action Sheet</a>	6
4.3	<a href="#">Land Management Work Program - current and future</a>	8
4.4	<a href="#">Soil Conservation Strategy</a>	10
4.5	<a href="#">Update on SHaRP</a>	11
4.6	<a href="#">Update on Waima Waitai Waiora</a>	14
4.7	<a href="#">Natural Resources Monitoring Work Programme - current and future</a>	16
4.8	<a href="#">SOE Reporting and Communications Framework</a>	19
4.9	<a href="#">Sediment Monitoring Review</a>	22
4.10	<a href="#">Natural Resources Monitoring progress against KPIs YTD</a>	25

**TITLE:** **Record of Actions – 8 December 2021**

**From:** Kathryn Pabirowski, Regulatory Services Admin/PA

**Authorised by** Jonathan Gibbard, Pou Tiaki Taiao – Group Manager Environmental  
**Group Manager/s:** Services, on 23 February 2022

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### **Whakarāpopototanga / Executive summary**

The purpose of this report is to present the Record of Actions of the last meeting (attached) held on 8 December 2021 for review by the meeting.

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### **Attachments/Ngā tapirihanga**

Attachment 1: Record of Actions 8 December 2021 [↓](#) 

Water and Land Working Party  
8 December 2021

## Water and Land Working Party Record of Actions

Meeting held in the Mangawhai Room and Virtually  
36 Water Street, Whangārei  
on Wednesday 8 December 2021, commencing at 1:00pm

### Tuhinga/Present:

Chairperson, Councillor Justin Blaikie  
Councillor Jack Crow  
Councillor Amy Macdonald  
Councillor Marty Robinson  
Councillor Joce Yeoman  
Ex-Officio Penny Smart  
TTMAC Representative Mira Norris

### I Tae Mai/In Attendance:

**Full Meeting**  
NRC Tumuaki - Chief Executive Officer  
Pou Whakaritenga - GM Regulatory Services  
Pou Tiaki Taiao - GM Environmental Services  
Land Management Programme Manager

The meeting commenced at 1.00 p.m.

### Ngā Mahi Whakapai/Housekeeping (Item 1.0)

### Ngā Whakapahā/Apologies (Item 2.0)

There were no apologies.

### Ngā Whakapuakanga/Declarations of Conflicts of Interest (Item 3.0)

**Presented by:** Chair Justin Blaikie

#### **Agreed action points:**

- Members were advised that these would be addressed as they arise.
- Chair Justin Blaikie declared a conflict of interest with the Hokianga Harbour Care group.

Water and Land Working Party  
8 December 2021

### **Receipt of Action Sheet (Item 4.1)**

**Presented by:** Colin Dall, Pou Whakaritenga - Group Manager Regulatory Services

The actions of the last meeting were reviewed.

**Agreed action points:**

- A letter to be drafted to Minister Nash following up on a letter send earlier in the year – Group Manager Regulatory Services.

### **Overview of Dung Beetle releases by New Zealand councils (Item 4.2)**

**Presented by:** Ruben Wylie, Land Management Programme Manager

An overview was provided on Dung Beetle releases by New Zealand councils.

**Agreed action points:**

- No actions required.

### **Land Management Approach (Item 4.3)**

**Presented by:** Jonathan Gibbard, Pou Tiaki Taiao – Group Manager Environmental Services and Ruben Wylie, Land Management Programme Manager

A presentation was provided on Land Management direction for 2021/2022.

**Agreed action points:**

- No actions required.

### **Whakamutunga (Conclusion)**

The meeting concluded at 2.47 p.m.

**TITLE:**                   **Receipt of Action Sheet**

**From:**                   Kathryn Pabirowski, Regulatory Services Admin/PA

**Authorised by**       Jonathan Gibbard, Pou Tiaki Taiao – Group Manager Environmental  
**Group Manager/s:**   Services, on

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**Whakarāpopototanga / Executive summary**

The purpose of this report is to enable the meeting to receive the current action sheet.

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**Nga mahi tutohutia / Recommendation**

That the action sheet be received.

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**Attachments/Ngā tapirihanga**

Attachment 1: Action Tracker [↓](#) 

## ACTIONS – Water and Land Working Party

Meeting Date	Item	WLWP Action	Responsible Staff	Status	Notes
26 May 2021	4.2 ColiMinder (real time E. coli testing)	A copy of the presentation to be provided.	Dr R Stott	Completed	Presentation circulated 6 December 2021. Discuss with NIWA first before passing this information onto anyone else. NIWA requested that if anyone in the WLWP wanted to distribute the presentation to an outside person/party, then they contact NIWA beforehand.
27 September 2021	4.1 Receipt of Action Sheet	That a report on the research or information on dung beetle releases held by other regional councils be presented to the next meeting.	Eastern Coast Land Manager	Completed	Report has been done and was included in the 8 December 2021 meeting.
27 September 2021	4.2 Aerial Application of Seed using Drones for Erosion Control Mitigation	Auckland Regional Council to be contacted regarding the costs involved with drone seeding. What was their approach and how successful it was.  Follow-up on a letter that was sent to the Minister of Forestry, Stuart Nash earlier in the year.	Group Manager Regulatory Services  Group Manager Regulatory Services	Completed  In progress	The NZ company (Envico Technologies) recently undertook a trial in the Hunua Ranges for Watercare planting natives local to the area. It won't be known if it is a success for a year or two (although germination rates should be known sooner). The company estimates the cost to be approximately \$1,000 per ha vs \$10,000+ for <u>manual</u> planting.  A draft letter to Minister Nash to follow up on the previous letter. The Chair had this on her list to discuss with her meeting with Minister Nash last year, but this was cancelled due to COVID. Consideration is being given as to whether the meeting is still needed. If not, then the follow up letter will be sent.
27 September 2021	4.3 Overview of Water Resources Investigation Projects in Northland (Aupōuri and Poutō)	An item to go to the next Planning and Regulatory Working Party meeting.	Group Manager Regulatory Services	Outstanding	Was not included in the 8 December 2021 Planning and Regulatory Working Party meeting.

**TITLE:** Land Management Work Program - current and future

**From:** Ruben Wylie, Land Management Programme Manager

**Authorised by** Jonathan Gibbard, Pou Tiaki Taiao – Group Manager Environmental  
**Group Manager/s:** Services, on 23 February 2022

### Whakarāpopototanga / Executive summary

The following table sets out the current and future work programme for the land teams for the coming year. It only includes work relevant to the Water and Land Working Party ToR.

Activity	Detail	When
<b>S-Map</b>	<p>S-map is a national soils database that provides an essential economic and environmental tool because it updates the fundamental soils data from the 1960s with high resolution and more accurate soil information via a dynamic digital portal. Staff are working with Manaaki Whenua to deliver S-Map across the region. The total project value is \$7M. NRC's contribution is through work in kind support for the project in addition to contributing \$1M.</p> <p>The first two years of the project (2022 and 2023) will be funded by MfE and Manaaki Whenua to a value of 1M. The remainder of the co-funding is being sought through MPI grant funding. Staff are in the process of preparing an application to MPI to secure funding for the project.</p>	2022 - 2027
<b>Waima Waitai Waiora</b>	<p>Waima Waitai Waiora is in its final year. Staff are heavily committed over the next several months to support landowners to plant approximately 67,000 plants and undertake associated riparian fencing within the Wairoa catchment. In addition, staff are working with the Waima Waitai Waiora to review the patronship arrangement to support the partners to come to a decision around the next stages for the partnership.</p>	2022-2023
<b>Soil conservation plans</b>	<p>The co-funding agreement between NRC and the Ministry for Primary Industries includes a target for delivering an average, 140 farm environment plans per annum. Because NRC is no longer delivering farm environment plans, staff have developed a revised process and template focused on soil conservation. These soil conservation plans provide a platform for landowners to secure funding through the SHaRP programme, similar to how Farm Environment Plans were linked to the Environment Fund. Owing to resourcing constraints within the team, the target will not be met, which will have implications for the co-funding contribution provided by MPI.</p>	2022-2023

Activity	Detail	When
<b>Environment Fund and Soil Conservation Grants</b>	Over the 2021/2022 year, the Land Management Team will support the delivery of over \$1M of grant funding, in addition to the supply of poplar and willow poles across Northland. Staff are in the process of working with landowners to prepare grant funding applications for the 2022/23 funding round.	2022-2023
<b>Catchment funding</b>	As part of the 2021-2031 Long Term Plan, Council established a new fund to support work in catchments. The first round of funding commences over the 2022/23 financial year. The first year of funding is \$311k, increasing to \$500k in following years. Staff are working with Council to establish the criteria and resourcing for delivery of this fund. Given the current high level of staff turnover and pressure to deliver current work programs, delivery of this new fund will be challenging.	2022-2023

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### Ngā mahi tūtohutia / Recommended actions

That the report, Land Management Work Program – current and future, prepared by Ruben Wylie, Land Management Programme Manager, be received.

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### Ngā tapirihanga / Attachments

Nil

**TITLE:** **Soil Conservation Strategy**

**From:** Ruben Wylie, Land Management Programme Manager

**Authorised by** Jonathan Gibbard, Pou Tiaki Taiao – Group Manager Environmental  
**Group Manager/s:** Services, on 22 February 2022

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### **Whakarāpopototanga / Executive summary**

The Northland Regional Council developed a soil conservation strategy in 2017 to support Long Term Plan objectives to reduce soil erosion through the development of farm environment plans, stock exclusion fencing and poplar and willow planting. Since 2017, the regulatory landscape has changed, particularly with freshwater farm plans becoming a regulatory requirement and a shift in the focus of the agriculture sector's contribution to climate change. Furthermore, key learnings from the council's soil conservation programme indicate that there is a need to diversify the land treatments available to landowners, to enable treatment options to be better tailored to specified sites.

For the above reasons, the soil conservation strategy needs to be updated to provide an evidence-based approach to support future investment towards the soil conservation programme and enable council to better integrate its soil conservation programme with other regional and national initiatives. These include the Kaipara Moana Remediation entity, NRCs Climate Change Strategy, integration with Freshwater Farm planning regulations, supporting the implementation of Te Mana o te Wai and the implications of climate change regulation on the agricultural sector.

Staff intend to issue an open tender for the Strategy by March 2022. Key objectives of the strategy are:

1. Provide an evidential basis for future soil conservation programmes, including cost benefit analysis of soil conservation initiatives.
2. Identify key erosion sources and associated criticality (based on existing available information).
3. Identify priorities for sediment mitigation efforts.
4. Identification of resourcing requirements to support the strategy delivery for the purpose of Long-Term Plan budgeting.
5. Provides an implementation plan that includes prioritisation and timing for the strategy delivery.

The Soil Conservation Strategy will be funded by the Ministry for Primary Industries by reprofiling unspent budget over the 2021/22 and 2022/23 financial years. The strategy is to be delivered by the fourth quarter of 2022 and will be a key document to support future funding applications and future budgets.

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### **Ngā mahi tūtohutia / Recommended actions**

1. Staff will submit a progress report of the strategy development at the next Water and Land Working party meeting.
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### **Ngā tapirihanga / Attachments**

Nil

**TITLE:** Update on SHaRP

**From:** Ruben Wylie, Land Management Programme Manager and John Ballinger, SHaRP Manager

**Authorised by** Jonathan Gibbard, Pou Tiaki Taiao – Group Manager Environmental  
**Group Manager/s:** Services, on 23 February 2022

### Whakarāpopototanga / Executive summary

The Sustainable Hill Country and Regional Priorities programme (SHaRP) is a four-year programme co-funded by Northland Regional Council and the Ministry for Primary Industries. The programme commenced in 2019 and is set to conclude at the end of the 2022/2023 financial year. The programme is heavily focused on supporting landowners to initiate soil conservation treatments on their land, including retirement fencing of erosion features, poplar pole planting and forest planting. The programme also has a research component; and research to date has been completed to identify coastal erosion features in the landscape and viable uses for mature poplar wood.

This report summarises the SHaRP programme to date and sets out the work focus for the final year of the programme.

#### Work completed to date:

##### Farm environment/Soil conservation plans

Following the release of essential freshwater NES-Freshwater Management, the land team began the transitioned from preparing farm environment plans to soil conservation plans in 2020-21. MPI accepted an interim site visit report in lieu of FEPs while we developed the new soil conservation plan process and template.

Our YTD achievement of this KPI is behind schedule and it is unlikely that we will meet the target of 136 plans. This is largely due to a very high staff turnover, Covid and refocusing of our efforts towards highly erodible land rather than the previous approach of developing FEP's anywhere. MPI have been informed and we will continue this dialogue. (Further details below)

Farm plan target	2019-20 (112 plans)	2020-21 (124)	2021-22 (136)
	112 (100%)	127 (102%)	36 (26%) YTD

##### Retirement fencing

This tranche of the programme is focused on supporting landowners to retire pastureland classified as highly erodible. In the first three seasons, NRC has supported landowners to fence 68km highly erodible land, retiring more than 527ha from pastoral production. This is more than twice the target for this deliverable.

Fencing target	2019-20 (75 ha)	2020-21 (71 ha)	2021-22 (84 ha)
	97 (129%)	194 (273%)	236 (281%)

### Forest planting

This tranche of the programme provides planting pilots to demonstrate alternatives to clear fell radiata on highly erodible pastureland. In the last two planting seasons, 128ha of new forest was planted. In 2022 another 99ha will be planted, providing a total of 227ha at project end (103% of target). Our overall target is 220ha.

Forest types include native and exotic production forest (under a continuous cover harvest regime), and native retirement. There is one pine project that demonstrated best practice providing significant riparian setbacks (well beyond minimum in NES-PF) that was planted in manuka. Exotic production forests included redwoods, eucalypts, cypress and radiata often using manuka as a nurse crop. Native production forest was totara with a manuka nurse crop. Native forest included mixed species (generally 80% pioneer species, 20% canopy), but most projects were manuka only.

Planting target	2020-21 (60 ha)	2021-22 (85 ha)	2022-23 (75 ha)
	38.3 ha (64%)	89.5 ha (105%)	99.5ha (133%) To be planted this season

### Pole planting

Poplars and willows are highly versatile, fast growing, exotic trees that are pivotal to soil conservation. In last two seasons, NRC supplied a total of 10,873 poles. NRC also provided a subsidies rate for the planting of these poles by contractors (up to \$7 per pole).

The original pole targets (5000, 10,000, 15,000 in years 2, 3 and 4 of the programme) were revised in 2021-22 under a variation to 7,000 poles annually. The revised target is based on estimates of what the nursery can supply under current conditions.

Pole target	2020-21 (5000 poles)	2021-22 (7000 poles)	2022-23 (7000 poles)
	4,616 (92%)	6,257 (89%)	TBC

### Research – coastal erosion buffer

Phase one and two of this project utilised LiDAR and remote sensing data to develop a tool to identify erosion features in the landscape. Erosion type and severity were quantified, and the output overlaid on oblique imaging providing an excellent visualisation tool for farm planning purposes. KMR are further developing the tool as part of their digital farm planning solution which we may seek to role out across the rest of the region (depending on the outcomes of the KMR pilot).

### Research – mature poplar

The poplar research has been assessing the building code compliance of Kawa poplar. This involves durability and mechanical testing. The overall driver for this research is to generate market opportunities for the timber so that farmers have confidence in growing the trees for soil conservation purposes, with a level of confidence that there are markets for the trees or logs at the end of their useful lifetime.

### A note regarding underspend

It should be noted that SHaRP is presently \$184k underbudget. This underspend is linked with the fact that the material cost for fencing have been less than originally estimated in the funding application. Consequently, the targets for SHaRP have been delivered at lower cost, resulting in a budget underspend despite exceeding the targets. Staff are working with MPI to reprofile budgets into other areas, including support for monitoring of poplar pole planting.

## **Focus in the final year**

### Project variation

In 2021 a variation was negotiated with MPI to vary the targets for pole planting, stakeholder engagement and farm environment plans. MPI have allowed us to reprofile the budget to other areas such as pole survival monitoring and a soil conservation strategy. The only restraint is any underspend must be spent within the same financial year, that is the budget cannot be rolled over.

### Soil Conservation Plans

Staff have made substantial progress delivering on the SHaRP programme, often exceeding targets for key on the ground deliverables. The Land Team, however, has experienced substantial resourcing challenges over the last 18 months, and this has significantly affected the team's ability to deliver on the programme target for soil conservation plans over the 2021/2022 financial year. These plans have taken the place of Farm Environment Plans and identify key erosion features on farms in addition to providing recommendations for erosion treatment options. In effect, Soil Conservation Plans provide a platform for landowners to initiate soil conservation treatments, including those that are funded through SHaRP. The delivery of soil conservation plans will be a key focus of the team over the final year of SHaRP because they represent a major target within the MPI funding agreement.

### Transitioning to future initiatives

Staff are presenting developing initial criteria for the regional afforestation grant fund. This fund is to support landowners to develop forests on highly erodible land. The funding is presently provided towards the SHaRP programme as parts of NRC's financial contribution toward the programme. The grant funding will come back into its own NRC allocation regime at the conclusion of the SHaRP project.

Afforestation initiatives typically require a 12 to 24 month lead in time to enable plant stock to be grown and delivered in time for the next planting season. Accordingly, staff will be working to develop criteria with Council over the next several months to enable land management advisors sufficient time to prepare afforestation applications for the 2023 planting season.

In addition, staff will be utilising the outcome of the upcoming soil conservation strategy to support future funding opportunities with central Government, with the intention to maintain the momentum generated by SHaRP. Initial discussions with MPI indicate that there is likely to be future funding opportunities, and staff will be heavily focused on securing available funding to support the objectives and anticipated outcomes of the soil conservation strategy.

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## **Ngā mahi tūtohutia / Recommended actions**

1. That staff provide a progress report to the Water and Land Working Party at its next meeting.

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## **Ngā tapirihanga / Attachments**

Nil

**TITLE:** Update on Waima Waitai Waiora

**From:** Ruben Wylie, Land Management Programme Manager and Anahita Djamali, Land Management Advisor

**Authorised by** Jonathan Gibbard, Pou Tiaki Taiao – Group Manager Environmental  
**Group Manager/s:** Services, on 22 February 2022

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### Whakarāpopototanga / Executive summary

The Waima Waitai Waiora (WWW) project is a five-year project that commenced in 2018. The project is co-funded by the Ministry for the Environment and is presently in its final year. The WWW project represents the culmination of a partnership between Kaipara mana whenua, community organisations and NRC, and the arrangement has given rise to some significant advancements in the way in which NRC works with mana whenua. Partnering with mana whenua and both national and local authorities has led to more robust decision-making processes, more meaningful outcomes, and continued support for the kaupapa from local residents.

The WWW project is focused on delivering several key projects with its partner groups. Key project tasks include supporting landowners to fence off waterways and plant an average of 100,000 plants per year over the five-year project timeframe. This report will summarise work that has been completed over the 2021 calendar year, and identify key tasks associated with the final year of the project.

Key highlights over the 2021 calendar year.

- The groups and organisations involved in the partnership of WWW planted over 100,000 native plants in and around the Northern Kaipara catchment area in 2021.
- Alongside the plants, over 8,700 meters of riparian fencing was established on farms throughout the area.
- Over \$37,000 was raised last year via the partnership's collaboration with the Sustainable Business Network's Million Metres Streams Project, with funds being donated by various businesses, community groups, and even some generous individual donors.
- Despite Covid-19 restrictions, a number of successful events were held by WWW partners last year, including research wānanga, community planting days, plant releasing, fish monitoring, and water monitoring. The community planting days in particular would not have been possible without the support of local groups, specifically tangata whenua and marae based roopu.
- The partnership has continued to provide quality information and support to landowners throughout the Northern Kaipara catchment area via a range of channels and mediums. One such channel is the WWW website, which was launched around mid-2021. The site continues to provide up-to-date information and resources for landowners wanting to implement sustainable practices on their land.

Key tasks for the final year of the project include:

- Completing planting plans and overseeing the delivery of around 67,000 plants, including associated riparian fencing is a key focus for the first half of 2021. Note: because the project has over-delivered in its annual planting numbers, 67,000 is the minimum required to achieve the five-year project milestone of 100,000 plants on average per year.
- Overseeing the delivery of the Te Kawa Waiora research project. This is a hapū guided research project concerning the health, wellbeing and mauri of the Wairoa River and its

tributaries. One of the key objectives of the project is the development of meaningful knowledge derived from mātauranga Māori which can be used to inform farm environment plans of the Wairoa Catchment. The project is due to be completed by June 2022.

- Undertake a review of the partnership. The review involves facilitated wānanga following a methodology utilised by Living Water for each of its major projects. The Omicron outbreak has resulted in some challenges and with initiating the review process, however staff will be working with Living Water to identify opportunities to adapt the review methodology to take into account the constraints present by the current outbreak.

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### **Ngā mahi tūtohutia / Recommended actions**

1. A progress update on the WWW project will be reported to the Water and Land Working part at its next quarterly meeting.

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### **Ngā tapirihanga / Attachments**

Nil

**TITLE:** **Natural Resources Monitoring Work Programme - current and future**

**From:** Jason Donaghy, Natural Resources Monitoring Manager and Shelley Quarterman, Natural Resources Team Administrator

**Authorised by Group Manager/s:** Jonathan Gibbard, Pou Tiaki Taiao – Group Manager Environmental Services, on

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### **Whakarāpopototanga / Executive summary**

The Natural Resource Unit is involved in wide range of interesting projects, the below provides an overview for the Water and Land working party and potential topics for future presentations or reports.

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### **Ngā mahi tūtohutia / Recommended actions**

That the report 'Natural Resources Monitoring Work Programme - current and future' by Jason Donaghy, Natural Resources Monitoring Manager and dated 22 February 2022, be received.

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### **Background/Tuhinga**

Below is a summary of the major projects/ workstreams the Natural Resource unit has underway or planned for the coming financial years. For each project there is a brief description of the key drivers, budget information, outputs and other relevant details:

1. Environmental monitoring network review.
2. Data automation project.
3. Digital Network model.
4. GIS land use layer.
5. Swim safe model.
6. Rain radar project.
7. Te Hiku project.
8. Environmental Data Hub.

#### **Environmental monitoring network review:**

The primary purpose of the environmental monitoring networks review is to respond and adapt to the changing requirements for environmental data and information and to ensure that the networks are fit for purpose, use best practice protocols and methods providing best value for money. The review has been completed. Currently the operational teams (Hydrology and Coastal and Water Quality) are implementing the recommendations. Some of the recommendations include new river flow stations and water quality sampling sites to better represent the Freshwater Management Units. The dune lakes will have a significant increase in continuous monitoring sensors along with an increased discrete monitoring regime from quarterly to monthly.

One of the key drivers for review is the revised 2021 National Policy Statement for Freshwater Management. The legislation has increased the demand for environmental data, driving a \$4m operational increase over the next ten years from 2021 -2031.

#### **Data automation project:**

The volume of council environmental data is predicted to double by 2023. Data is collected and stored in a raw format. The data needs to be checked before it can be used for science and policy setting. The checking of the data is currently completed by council data analysts, which takes time.

The current system of using council staff will not keep up with the predicted data volume. A project is underway to automate many of the current manual processes. The budget is approximately \$90k for the next two financial years, reducing down to \$25k for the following years. The output is computing coding that completes the data checking for staff. The first stage is completed which automates council's reporting processes. The next stage involves automating the data checking processes. Other regional councils have been consulted to try and develop a collaborative solution. The target date for completion is June 2023.

#### **Digital Network model:**

The proposed digital river network model will be developed by using high-resolution LiDAR data to better represent the actual flow path for most of the waterways in the region including the small watercourses. The new regional digital river network model will also improve council's hydrological and water quality models.

Use of the proposed digital river network will increase:

- The accuracy of GIS based water quantity and quality models and therefore increase our confidence in setting water quality limits for the Proposed Regional Plan.
- Information required for planning provisions and land management mitigation measures for improved water quality.
- Information required for catchment delineation.
- Information required for the implementation of proposed NES and NPSFM.

The output is a GIS layer to be completed by December 2022 with a first stage completed by June 2022 with a budget of \$100k capex.

#### **GIS land use layer:**

A GIS based high-resolution land-use layer is currently being scoped to integrate key regional scale information (e.g., soil, geology, landcover, land use intensification). The GIS layer is critical for improved freshwater accounting, economic impact assessment, policy development and efficient implementation of land management mitigation measures.

The National Policy Statement for Freshwater Management (NPS-FM) requires regional councils to set limits for freshwater resources at specific catchment scale (Freshwater Management Units). A GIS-based high-resolution land-use map layer integrating several other landscape factors (e.g., soil, geology, land-use intensification) is critical to modelling the effects of land-use pressures on water quality loads. It will also assist with economic impact assessment of future plan changes and work programmes related to non-regulatory initiatives at catchment scale.

The budget is \$160k Capex, the output is a GIS layer scheduled to be delivered by June 2022.

#### **Swim safe model:**

This project will increase the level of service to the public by providing both real-time and future water quality predictions at Northland's recreational bathing locations. Surf Lifesaving New Zealand has recently switched over to the swim safe platform.

This programme will result in the savings of around \$15,000 salary per year and reduction of laboratory costs of \$26,000 per year. Therefore, the ongoing costs of this project are near cost neutral with the current recreational bathing programme. The key benefit is the saving of 90 staff days over the busy summer period (Dec-Mar).

The budget is:

- capex of \$90k year 1
- opex of \$10k year 1
- opex of \$41.5k the following years.

The system was trialled over the 2021 summer period, the target date for full implementation is June 2022.

**Rain radar project:**

The rain radar project also known as the storm tracking system is a collaboration between regional and district council. The system can track storms down to 500m resolution which provides a significant increase in short term information for emergency management and long-term impacts regarding hazards, climate change and water management. The system is being trialled from September 2021 to September 2022. The budget or cost is \$66k opex which has been shared evenly between the four councils.

**Te Hiku project:**

The Te Hiku project is a collaboration between Northland Regional Council, Ngati Kuri, Te Aupōuri, Te Rarawa, Ngai Takato, GNS Science, Department of Conservation, Far North District Council, Aqua Intel Aotearoa and Kānoa.

Electromagnetic surveying equipment will be flown over the Aupōuri aquifer to improve the spatial understanding of the system (key driver).

The outputs from this proposal, coupled with council's current projects, will assist in answering the following questions:

- How much water can be taken (and from where) while avoiding saltwater intrusion?
- Where are the area's most at risk of saline intrusion? – inform focused monitoring.
- Where is the aquifer and shallow groundwater systems connected to valuable dune lakes and wetlands? Ensure valuable ecosystems are not adversely affected.

Council is contributing \$100k this financial year and \$150k the following year. The key deliverable is a dataset used for modelling which then links into science, reporting and information delivery.

**Environmental Data Hub**

The website displaying council environmental data was significantly upgraded late 2021. The project was led by the Digital and Design team, with assistance from the Natural Resources Data team. The upgrade resulted in additional sites and monitoring programs being displayed:

- 500 sites added
- 50 new measurement types.
- 7 new programs

The project aligned with council's desire to make more data accessible and available to the community.

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**Ngā tapirihanga / Attachments**

Nil

**TITLE:** **SOE Reporting and Communications Framework**

**From:** Jason Donaghy, Natural Resources Monitoring Manager and Jean-Charles Perquin, Natural Resource Science Manager

**Authorised by Group Manager/s:** Jonathan Gibbard, Pou Tiaki Taiao – Group Manager Environmental Services, on

### Whakarāpopototanga / Executive summary

The Natural Science team has recently redesigned council reporting framework for environmental data, this report provides an update on the new framework.

### Ngā mahi tūtohutia / Recommended actions

That the report ‘SOE Reporting and Communications Framework’ by Jason Donaghy, Natural Resources Monitoring Manager and Jean-Charles Perquin, Natural Resource Science Manager and dated 22 February 2022, be received.

### Background/Tuhinga

NRC has a statutory obligation under the Resource Management Act 1991 to publicly report on the regions state of the environment. The last state of the environment report was published in 2016. Due to other reporting, resourcing and work demands a full SOE report has not been compiled for publication within the five-year timeframe (i.e. published by 2021). While various reports have been produced and information made available, our SOE requirements have not been met.

The Natural Science team has reviewed the current situation and have proposed that rather than creating one large report on a five-yearly cycle, that we move to a process whereby we produce yearly reports on key environmental topics. With the intention that over the five yearly cycle all key environmental domains are covered and reports published.

Table 1 provides a summary of the proposed environmental domains and the priority order for developing and publishing those reports. Staff will be available to discuss the rationale for the respective priority order.

Table 1: Reporting timeframe

Timeframe	Domain	Topics covering pressure & impact, state and response*	Project Teams
2022	Biodiversity (including Biosecurity)	- Terrestrial - Freshwater - Marine	Biodiversity and Biosecurity, Natural Resources Science
2023	Land	- Land cover - Land-use & land-use change - Land stability & soil health	Land Management
2024	Marine	- Marine water quality - Receiving environment	Natural Resources Science
2025	Freshwater	- Groundwater - Water quantity - Surface water	Hydrology, Natural Resources Science
2026	Air and climate	- Air quality - Climate - Climate change	Hydrology, Natural Resources Science, Climate Change

## Progress/Development

For more effective communication and engagement, the reporting framework was redesigned this year to include other important areas of science communication. Several other key science reporting components have been identified through the development of the new environmental reporting framework, including, but not limited to, technical reports, science snapshot reports, newsletters, fact sheets, videos, PowerPoint presentations and interactive story maps. The new environmental reporting framework incorporates two main components:

1. Core reporting
  - State of Environment (SOE) Reports
  - Monthly CEO reports
  - Technical reports
2. Reporting toolbox
  - Science snapshot reports
  - Newsletters
  - Fact sheets
  - Videos
  - PowerPoint presentations
  - Interactive story maps

For effective communication with a wide range of audiences, the NR Science team is also developing a peer-review system. The peer-review process will confirm the importance of considering information and perspectives from a broad range of sources to ensure a balanced and complete picture of our environment (state, impact, response and outlook). This peer-review system will involve both, the external and internal (i.e., NR Science and Communications team) reviewers.

- Externals (including subject experts): ensuring our content is scientifically sound and accurate.
- Internals (including scientists, council's communication experts): ensuring our content is fit for presenting information to all audiences, promotes good public relations in alignment with council's areas of focus and priorities.

## Communication Model

The communication model demonstrated in the below diagram is adapted by the NR Science team for the effective dissemination of Northland environmental information to wider audiences.

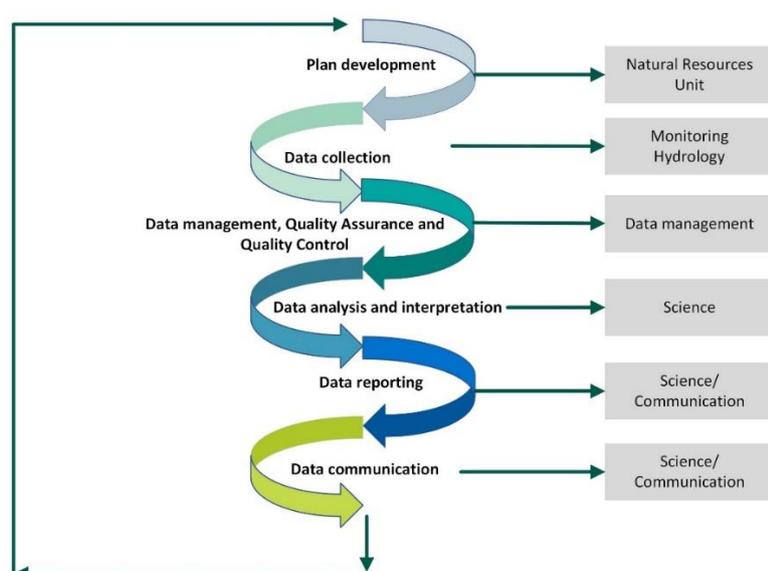


Figure 1 Science communication model.

### **Approach to the Natural Resources Science Communication**

The ultimate approach of the Natural Resources (NR) Science team is not only to report environmental information, but to use the information to help us prevent, reduce and repair environmental harm and risk (through good policy and regulation, targeted programs and projects). This approach aligns well with the scope and six goals of the Northland Regional Council (NRC) Environmental Science Strategy 2021.

*“The science strategy will also serve as the basis for identifying key future areas for research and development. Its implementation will provide a further understanding of Northland’s environment for enhanced natural resource management”.*

NRC Environmental Science strategy goals are to:

1. Provide natural resources information to meet stakeholders, iwi and regional community needs.
2. Deliver timely scientific analysis and resource management decision support tools.
3. Advance understanding and knowledge of processes that determine the state of natural resources.
4. Predict changes in resources availability and quality in response to changing climate, population, resources use and management scenarios.
5. Anticipate and respond to water-related emergencies.
6. Inform, engage and empower stakeholders, iwi and regional communities.

### **Matauranga Māori – Environmental Monitoring**

It is acknowledged that to date councils level of support and recognition of Māori environmental monitoring knowledge and data has been low. Significant future work is required to better understand how council can support Matauranga Māori environmental monitoring and how this can be supported to influence regional resource management decision making. This kaupapa is currently being progressed through TTMAC and it is hoped that a future Maturanga Māori Environmental Monitoring Framework may be developed. In parallel with this process, it will be important for the Natural Resources Science and Monitoring teams to review our Environmental Science Strategy and communication approach, to ensure our current systems and processes are adjusted to ensure they can respond to and support Māori environmental monitoring programs and information.

Staff will provide a short presentation to the working party to provide an opportunity for further discussion.

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### **Ngā tapirihanga / Attachments**

Nil

**TITLE:** **Sediment Monitoring Review**

**From:** Jason Donaghy, Natural Resources Monitoring Manager and Jean-Charles Perquin, Natural Resource Science Manager

**Authorised by** Jonathan Gibbard, Pou Tiaki Taiao – Group Manager Environmental  
**Group Manager/s:** Services, on 24 February 2022

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### **Whakarāpopototanga / Executive summary**

Council's scientist team is currently scoping options regarding sediment monitoring. This report provides an overview of the current monitoring undertaken.

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### **Ngā mahi tūtohutia / Recommended actions**

That the report 'Sediment Monitoring Review' by Jason Donaghy, Natural Resources Monitoring Manager and Jean-Charles Perquin, Natural Resource Science Manager and dated 22 February 2022, be received.

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### **Background/Tuhinga**

Sediment is one of the key freshwater contaminants in Northland, however monitoring sediment loads is difficult. While NRC has a sediment monitoring program there are gaps and opportunities for improvement, which has been further highlighted by the National Policy for Freshwater Management 2021 (NPSFM). Under the latest policy, sediment monitoring using a visual method is currently included for deposited sediment. But this does not assist with calculating the sediment loads entering the harbours, which is required under the freshwater accounting section in the NPSFM. To account for sediment loads, suspended sediment concentration (SSC) is required, this was removed from the NPSFM due to the complexity with sensors measuring the data. The aims and methods at a national level are not currently aligned.

The key driver for monitoring has been to calculate sediment loads entering the waterways. The challenges regarding sediment monitoring are:

- Sampling stations: require a lot spatially to provide regional context but require significant resourcing.
- No nationally agreed sediment sampling programme for the various methods and instruments.
- Connecting sediment data with natural process/reality is difficult.

Monitoring sediment during stormflows is also critical while estimating catchment sediment loads, which represents significant proportion of cumulative loads to the downstream receiving environment. This includes river networks, estuaries and harbours (Land & Water Science, 2021). In 2010, NIWA (McKergow and Hughes, 2010; Hughes, 2013) recommended event-triggered sediment sampling (event-sampling) using automatic samplers to supplement the monthly SoE sampling as best practice for monitoring sediment loads in Northland rivers.

An autosampler pumps water out of a river during a flood event at a set frequency, filling twenty-four bottles, which are sent to a laboratory for analysis to provide the SSC. In addition to the bottles a sensor is also measuring turbidity every fifteen minutes. In theory over time a relationship between the turbidity sensor and the SSC can be established, removing the need for bottles and laboratory analysis. The relationship can take many years to confirm.

Due to the lack of national guidance in sediment monitoring, a virtual conference between key NRC staff and NIWA expert Dr Andrew Hughes has been organised for 24 February 2022. A discussion will be held on innovative and pragmatic sediment monitoring practices for implementing NPSFM as well as assessing mitigation effectiveness.

Below is a brief timeline of the suspended sediment monitoring to date to provide some context regarding the current sediment monitoring programme:

- In 2013, council agreed to support an Auckland Council project lead by National Institute of Weather and Atmosphere (NIWA). The project involved installing 7 auto-samplers on all the major rivers in the Northern Wairoa catchment. The data was used for modelling sediment loads entering the Kaipara Harbour. The sites were closed after completion of the project. Key learnings from the project were the resourcing required to set up and operate the autosamplers and the challenges to reach the stations during significant flood events.
- In 2014, two permanent auto-samplers were established on the Otaika and Hātea rivers to establish sediment loads entering the Whangārei harbour and inform future policy setting. It was several years before a significant flood occurred and sediment data was recorded. Council planned to install additional autosamplers across the region. Due to logistical and resourcing challenges, the focus shifted to collecting high quality data at the two existing sites where access was secure during a significant flood.

#### **Summary of event-triggered sediment monitoring for Northland rivers:**

Council undertakes sediment event-sampling at the following two hydrological monitoring sites located in the catchments draining into Whangārei Harbour:

- Otaika at Otaika Valley Road.
- Hātea at Whareora Road.

In 2021 Natural Resources Science Team analysed the most recent sediment data collected at the above two sites between December 2019 and July 2021. The purpose of this analysis was to evaluate effectiveness of the information gathered so far for estimating sediment loads from continuous field measurements (i.e., telemetered turbidity and flow data) and to identify data gaps.

#### **Highlights from the above data analysis:**

- A good statistical relationship between laboratory analysed sediment samples (SSC) and continuous field turbidity (Turb) both at Otaika and Hātea sites. This helped deriving annual sediment loads from continuous Turb and flow measurements at both sites.
- Annual sediment loads estimated from SSC-Turb relationship showed that majority (>60%) of the loads come from winter stormflow events. For example, 90% of the annual sediment load in 2020 at Hātea site was generated by the July 2020 flood event.
- Most of the sediment loads generated in Otaika catchment were possibly from bank erosion by examining the patterns of continuous SSC versus flow during individual storm events. This was also found in Mangakāhia River by NIWA (2016) report.
- Requirements of additional sediment sampling beyond certain turbidity ranges were identified at both sites, which would enhance the site-specific SSC-Turb relationships, therefore reduce the sediment load prediction errors.

In summary, event-sampling can be an effective tool to measure the efficiency of catchment mitigation measures by tracking the change in sediment loads for downstream environments. Given the high resource requirement, it is a significant challenge to utilise the event-sampling technique across the region for SOE monitoring purposes. However, this monitoring technique can be prioritised in areas where the need is utmost and major catchment mitigation initiatives have been planned for erosion and sediment control, such as Northern Wairoa.

Staff are currently reviewing our sediment monitoring program and in discussions with NIWA to identify options for improved spatial data without the high resourcing demand. It is also recognised that there are connections between this work and the recent council discussion around the effectiveness of mitigation measures to reduce sedimentation from plantation forestry. The Land and Water Working Party will be kept informed as this program develops, given the significance of sediment as a freshwater contaminant in Northland, and the need for greater understanding of cause and effect as an evidence base for future mitigation measures.

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**Ngā tapirihanga / Attachments**

Nil

**TITLE:** Natural Resources Monitoring progress against KPIs YTD  
**From:** Jason Donaghy, Natural Resources Monitoring Manager  
**Authorised by** Jonathan Gibbard, Pou Tiaki Taiao – Group Manager Environmental  
**Group Manager/s:** Services, on 23 February 2022

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### Whakarāpopototanga / Executive summary

The below report details the Natural Resource unit's performance regarding is LTP Level of Service and KPI's.

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### Ngā mahi tūtohutia / Recommended actions

That the report 'Natural Resources Monitoring progress against KPIs YTD' by Jason Donaghy, Natural Resources Monitoring Manager and dated 22 February 2022, be received.

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### Background/Tuhinga

The Natural Resources Unit recently reviewed the Levels of Service. A key theme from both the councillors and central government was to make environmental data more accessible to the community. With this in mind, the team developed three new KPIs, shown below:

It should be noted KPI 4 is an annual indicator based on a financial year, it will be available in July 2022.

#### Levels of Service:

KPIs on a quarterly basis – link to latest report available [here](#)

<p><b>KPI 1:</b> Percentage of time that flood-level monitoring is accurate (to enable flood warnings to be developed) and is made available to the community:</p>
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<p><b>Intent:</b> Is to show that flood warning are timely and accurate.</p>
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<p><b>Result:</b> 100%, target met</p>
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<p><b>KPI 2:</b> Percentage of NRC environmental networks monitored for water quality and quantity, and ecology, with results made available to the community (new):</p>
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<p><b>Intent:</b> Is to show that sites have been visited regarding each network.</p>
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<p><b>Result:</b> For the period 1 January 2021 to 31 December 2021: <b>100%</b> of expected site visits were achieved versus a target of 100%, target met.</p>
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<p><b>KPI 3:</b> Percentage of data from routinely monitored sites that meets quality standards and is made available to the community within 12 months of collection (new):</p>
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<p><b>Intent:</b> To show that data collected has been quality assured within 12 months and made available to the public.</p>
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<p><b>Result:</b> For the reporting period 1 January 2021 to 31 December 2021: most of the networks were compliant, with a median value of <b>100%</b> versus the target of 90%, target met.</p>
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<p><b>KPI 4:</b> Percentage of time that continuous monitoring of air sheds is achieved, with any exceedances of National Environmental Standards reported and made available to the community.</p>
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<p><b>Result:</b> 100%, target met</p>
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Air quality is reported on the LAWA website, below is a graph showing the compliance status regarding the above KPI:

**Table 1: Air quality KPI results:**

Data table PM <sub>10</sub>					
Towns	10-year Trend	2021 annual average (µg/m <sup>3</sup> )	Highest daily average (µg/m <sup>3</sup> )	2nd highest daily average (µg/m <sup>3</sup> )	Number of exceedances
Ruakaka	-	12	50 (29 Jan 2021)	41 (11 Jun 2021)	0
Whangārei	-	12	32 (4 Nov 2021)	29 (3 Nov 2021)	0

**KPI 5:** Percentage of routinely monitored river sites with a Water Quality Index (WQI) score of 'Excellent' or 'Good'

**Intent:** Is to show the effectiveness of land management activities on water quality.

**Result:** Annual KPI due in July 2022

The use of the median regarding KPI 3 is intended to give a sense of how the entire network is performing. This method highlights the problem areas but prevents individual monitoring programmes dragging the entire performance measure down.

Automatic reporting has now been developed to report on the new levels of service KPIs.

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## Ngā tapirihanga / Attachments

Nil