I hereby give notice that an ordinary meeting of the Catchment Operations Committee will be held on:

Date: **Tuesday, 11 June 2019**
Time: **9.00am**
Venue: **Tararua Room**
Horizons Regional Council
11-15 Victoria Avenue, Palmerston North

CATCHMENT OPERATIONS COMMITTEE

AGENDA

MEMBERSHIP

Chair	Cr DB Cotton
Deputy Chair	Cr LR Burnell QSM
Councillors	Cr JJ Barrow
	Cr EB Gordon JP(ex officio)
	Cr RJ Keedwell
	Cr GM McKellar
	Cr JM Naylor
	Cr NJ Patrick
	Cr PW Rieger QSO JP
	Cr BE Rollinson
	Cr CI Sheldon
	Cr WK Te Awe Awe

Michael McCartney
Chief Executive

Contact Telephone: 0508 800 800
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Postal Address: Private Bag 11025,
Palmerston North 4442

Full Agendas are available on Horizons Regional Council website
www.horizons.govt.nz

Note: The reports contained within this agenda are for consideration and should not be construed as Council policy unless and until adopted. Items in the agenda may be subject to amendment or withdrawal at the meeting.

for further information regarding this agenda, please contact:
Julie Kennedy, 06 9522 800

CONTACTS	**24 hr Freephone : 0508 800 800**	**help@horizons.govt.nz**		**www.horizons.govt.nz**
SERVICE CENTRES	**Kairanga** Cnr Rongotea & Kairanga-Bunnythorpe Rds, Palmerston North	**Marton** 19-21 Hammond Street	**Taumarunui** 34 Maata Street	**Woodville** Cnr Vogel (SH2) & Tay Sts
REGIONAL HOUSES	**Palmerston North** 11-15 Victoria Avenue	**Whanganui** 181 Guyton Street		
DEPOTS	**Levin** 120-122 Hokio Beach Rd	**Taihape** 243 Wairanu Rd		
POSTAL ADDRESS	Horizons Regional Council, Private Bag 11025, Manawatu Mail Centre, Palmerston North 4442			
FAX	06 9522 929			

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AGENDA

1 Welcome/Karakia

2 Apologies and Leave of Absence

At the close of the Agenda no apologies had been received.

3 **Public Forums:** Are designed to enable members of the public to bring matters, not on that meeting's agenda, to the attention of the local authority.

Deputations: Are designed to enable a person, group or organisation to speak to an item on the agenda of a particular meeting.

Requests for Public Forums / Deputations must be made to the meeting secretary by 12 noon on the working day before the meeting. The person applying for a Public Forum or a Deputation must provide a clear explanation for the request which is subsequently approved by the Chairperson.

Petitions: Can be presented to the local authority or any of its committees, so long as the subject matter falls within the terms of reference of the council or committee meeting being presented to.

Written notice to the Chief Executive is required at least 5 working days before the date of the meeting. Petitions must contain at least 20 signatures and consist of fewer than 150 words (not including signatories).

Further information is available by phoning 0508 800 800.

4 Supplementary Items

To consider, and if thought fit, to pass a resolution to permit the Committee/Council to consider any further items relating to items following below which do not appear on the Order Paper of this meeting and/or the meeting to be held with the public excluded.

Such resolution is required to be made pursuant to Section 46A(7) of the Local Government Official Information and Meetings Act 1987 (as amended), and the Chairperson must advise:

(i) The reason why the item was not on the Order Paper, and

(ii) The reason why the discussion of this item cannot be delayed until a subsequent meeting.

5 Members' Conflict of Interest

Members are reminded of their obligation to declare any conflicts of interest they might have in respect of the items on this Agenda.

Minutes of the fifteenth meeting of the tenth triennium of the Catchment Operations Committee held at 11.06am on Tuesday 9 April 2019, in the Tararua Room, Horizons Regional Council, 11-15 Victoria Avenue, Palmerston North.

PRESENT	Crs DB Cotton (Chair), JJ Barrow, LR Burnell QSM, EB Gordon JP (ex officio) (from 11.06am to 12.38pm and 1.52pm to 2.49pm), RJ Keedwell, GM McKellar, JM Naylor, NJ Patrick, PW Rieger QSO JP, BE Rollinson and WK Te Awe Awe.
IN ATTENDANCE	Chief Executive — Mr M McCartney Committee Secretary — Mrs KA Tongs
ALSO PRESENT	At various times during the meeting: Mr R Strong (Group Manager River Management), Mr G Shirley (Group Manager Regional Services & Information), Dr N Peet (Group Manager Strategy & Information), Mr J Bell (Manager Investigations & Design), Mr G Cooper (Manager Land & Partnerships), Ms A Matthews (Manager Science & Innovation), Mr M Guy (Land Management Coordinator), Ms L Owen (Environmental Programme Coordinator), Ms C Morrison (Manager Media & Communications), Draft Annual Plan submitters and supporters, Mr F Maas & Ms L Fox from Opus, and a member of the Press.

The Chair welcomed everyone to the meeting.

APOLOGIES

COP 19-106 ***Moved*** ***Burnell/Te Awe Awe***

That an apology be received from Cr Sheldon.

CARRIED

PUBLIC FORUMS / DEPUTATIONS / PETITIONS
Submitters to the Draft Annual Plan had been granted a Public Forum to speak to their submission.

SUPPLEMENTARY ITEMS
There were no supplementary items to be considered.

MEMBERS' CONFLICTS OF INTEREST
There were no conflicts of interest declared.

CONFIRMATION OF MINUTES

COP 19-107 ***Moved*** ***Rollinson/Rieger***

That the Committee:

confirms *the minutes of the Catchment Operations Committee meeting held on 12 February 2019 as a correct record, and notes that the recommendations were adopted by the Council on 26 February 2019.*

CARRIED

PRESENTATION: MANAWATU RIVER MODEL THROUGH PALMERSTON NORTH
Report No 19-53

Mr Maas & Ms Fox, representatives from Opus, made a presentation to Council on the two dimensional modelling of the Manawatu River through Palmerston North.

COP 19-108 ***Moved*** ***Te Awe Awe/Keedwell***

That the Committee recommends that Council:

a. receives the information contained in the presentation from Opus.

CARRIED

RIVER AND DRAINAGE ENGINEERING REPORT
Report No 19-52

This item reported on progress with river and drainage activities for the period 14 February 2019 to 9 April 2019. Mr Strong (Group Manager River Management) introduced his report and took Members through his presentation. He highlighted the work being carried out by engineering consultants Tonkin and Taylor, the Putorino landfill diversion and gravel extraction volumes, and the alignment of the Tiraumea River. Discussion was had regarding the responsibility for the reinstatement cost of Flygers Line and the future of the Pakihi Scheme.

The meeting adjourned at 12.38pm.

Cr Gordon left the meeting at 12.38pm.

The meeting reconvened at 1.13pm.

This item was suspended to allow for public forum speakers.

Mr Geoff Kane expressed his concerns at the lack of outcomes from the Hokio and Koputaroa Drainage Scheme meetings, the issues associated with continued subdivision development and advocated for the proposed rates increase to be put on hold pending a review of the current drainage scheme.

Mr David Roache (Foxton Community Board) summarised the points made in the submission and on behalf of the Board expressed opposition to the Foxton East Drainage Scheme in its current state, and the difficulties in working with two Councils. Mr Roache thanked Horizons' staff for their support to the application made to the Provincial Growth Fund.

Mr Bill Huzziff handed out maps and copies of photographs which highlighted his concerns about the workability of the proposed relief pipeline for the Foxton East Scheme and the proposed changes to the Foxton East targeted rate classification.

The meeting returned to the River and Drainage Report and considered issues presented by speakers at the Public Forum.

Cr Gordon re-joined the meeting at 1.52pm.

There was discussion in regard to the concerns raised by Mr Kane (submitter no. 24). Members provided their views and comments around the issues raised. Accordingly a new recommendation b. was put by the Chair.

COP 19-109 ***Moved*** ***Burnell/Te Awe Awe***

That the Committee recommends that Council:

a. receives the information contained in Report No. 19-52.

b. requests that the Chair writes to all the TAs to consider the long-term impacts of urban development through future focused urban growth / spatial plans to ensure all impacts of urbanisation are managed appropriately.

CARRIED

SUSTAINABLE LAND USE INITIATIVE (SLUI)
Report No 19-54

This report updated Members about progress on Horizons Sustainable Land Use Initiative (SLUI) for the period 1 January to 28 February 2019. Mr Cooper (Manager Land & Partnerships) took the item as read and highlighted the number of farm plans allocated to contractors for this financial year and the impact of new farm plans on the forecast figures as depicted in Table 6.

COP 19-110 ***Moved*** ***Rieger/Rollinson***

That the Committee recommends that Council:

a. receives the information contained in Report No. 19-54.

CARRIED

REGIONAL COAST & LAND
Report No 19-55

Mr Cooper (Manager Land & Partnerships) introduced this report which updated Members on progress with Council's Regional Land and Coastal and Whanganui Catchment Strategy activities from 1 January to 28 February 2019. Mr Cooper mentioned the reallocation of grant funding expenditure in the year to date in the Whanganui Catchment Strategy. Discussion was had regarding the presence of a poplar sawfly in Dunedin.

COP 19-111 ***Moved*** ***McKellar/Burnell***

That the Committee recommends that Council:

a. receives the information contained in Report No. 19-55.

CARRIED

The meeting closed at 2.49pm.

Confirmed

_____ _____
CHIEF EXECUTIVE GROUP MANAGER RIVER MANAGEMENT

_____
GROUP MANAGER NATURAL RESOURCES
AND PARTNERSHIP

Report No.	19-86
Information Only - No Decision Required	

RIVER AND DRAINAGE ENGINEERING REPORT

1. PURPOSE

1.1. The purpose of this item is to report on progress with river and drainage activities for the period 9 April to 11 June 2019.

2. RECOMMENDATION

That the Committee recommends that Council:

a. receives the information contained in Report No. 19-86.

3. FINANCIAL IMPACT

3.1. Funding provision for all activities reported on in this item is either included in the River and Drainage General or River and Drainage Schemes Activity sections of the 2018-28 **Long-term Plan (LTP)**; is covered by an approved carry-forward of unexpended budget from the 2017-18 financial year; or additional approval will be specifically sought by way of recommendation in the item.

4. SIGNIFICANT BUSINESS RISK IMPACT

4.1. There are no significant risks relating to the adoption of the recommendations contained in this report.

5. DISCUSSION

5.1. The development of a management strategy for the Rangitikei River continues with staff presenting to the Ngā Puna Rau Rangitikei group meeting on 17 May. A French intern student under the tutelage of Massey University's Physical Geography Professor Ian Fuller, is assisting staff with assembling the base information required to develope the strategy. Staff anticipate presenting the strategy to the September Committee meeting.

5.2. Work to divert the Rangitikei River away from the old **Rangitikei District Council (RDC)** landfill at Putorino (approximately 7 km south of Hunterville) was completed in April. As was made clear to RDC staff at the time, the diversion is very much a temporary measure; flow regime over winter will determine it's longevity. RDC are currently investigating more lasting solutions to prevent further river erosion.

5.3. Staff met with the Waikawa Beach Ratepayers Association committee in April to provide an overview of the work undertaken by **Tonkin and Taylor (T&T)**. That frames the complex fluvial and coastal processes at play along this part of the western coastline and the range of interventions and estimated costs. A public meeting has been arranged for 8 June.

5.4. Endeavours to obtain central government funding to effect repairs/ deferred maintenance to the groynes and other training works along the lower reach of the Whanganui River

continues. Late in April, staff were advised that the Provincial Growth Fund application had been declined; that turned out not to be the case, with **Ministry of Business Innovation and Employment (MBIE)** staff confirming that the application is still being processed.

5.5. MBIE staff and advisors visited Whanganui Port on 16 April to better understand both the Port Revitalisation Project being led by **Whanganui District Council (WDC)** and the river training structures. Discussion has also been had with Treasury's National Infrastructure Unit on what other funding avenues exist, in part determining how best to translate hustings commitments made in 2017 into central government funding.

5.6. As noted previously, this project has particular requirements around rock riprap – the large size required for the outer mole armoring. WDC staff are (at the time of writing) about to re-open the Waitahinga Quarry inland from Whanganui to assess it's potential to provide that large rock. That will prove a critical step for the project, as options around large rock (even as far afield as Takaka) are limited.

5.7. The Regulatory team have advised that maintenance activity associated with the Lower Whanganui Scheme may be in breach of the One Plan requirements. At the time, the Lower Whanganui Scheme was established, the consensus view was that the Code of Practice did apply to the new entity; further consideration has identified this not to be the case. As noted in the body of the report, the inception of a district-wide approach has identified some gaps in regard to environmental compliance across a range of operational activities with the intent of systematically addressing those gaps.

5.8. Initiatives to reduce the flood hazard risk for Foxton continue to progress; the main notable activities over the period are meeting with Iwi to outline the rationale behind the solution proposed and a staff technical workshop to be held on 5 June. That workshop will consider alternatives to the Cook Street alignment including those outlined by submitters to both the LTP and the 2019-20 Annual Plan.

5.9. Included in that mix is a proposal to construct one or more small wetlands/ sediment traps off Kings Canal to both improve the efficiency of the drainage network along the eastern edge of Foxton and provide better environmental outcomes (quality of the discharge to the Foxton Loop). Staff are looking to progress that initiative with some of the subdivision proposals along the eastern edge of the town, likely to require land purchase and in turn specific Council approval.

5.10. Previous reports have identified the investment currently being made in the area of asset management with the roll out of a new system provided by Adapt Solutions Limited. In parallel with that, development of a comprehensive Operations and Maintenance Manual for the **Lower Manawatū Scheme (LMS)** continues. To aid with that development (a new initiative for river management) staff visited Genesis' Tokaanu Power Scheme to compare notes/ systems approaches to asset management, an exercise strongly beneficial to both.

5.11. Financially, river management activity continues to track largely to budget late in the financial year. Council approved an additional draw on Rangitikei Scheme reserves in April taking the total draw in the current financial year to $450,000, addressing 2018 flood damage. A relatively minor (with my delegation) draw on reserves may be necessary for the Makerua Scheme late in the financial year.

5.12. Included in equipment purchase budgets for the 2019-20 financial year are the purchase of two new excavators for the Kairanga depot. The first of those purchases replaces the existing 12 tonne machine purchased 24 years ago (and with around 11,000 hours of operation recorded). The second looks to replace a 3.5 tonne dry-hire machine with a Council-owned machine; this machine has become an integral component of Kairanga's

capability, not just in river management but also with a range of freshwater initiatives. A large component of the Freshwater team are scheduled to be based in Kairanga from 2020, reinforcing the strong linkages between the two teams.

5.13. Sector initiatives around working together more effectively, setting/ influencing the national research agenda, workforce capability and capacity and raising the profile of the sector continue. I lead the workforce capability and capacity area with a range of initiatives underway in close collaboration with Human Resources representatives from around the country. Professor Fuller has been a key influence in efforts to better connect the academic sector. River management professionals from around the country (including Horizons) will be attending a Massey University two day river practitioners workshop in June.

5.14. As noted previously, the structure of River Management is proposed to be changed, creating a positon of Operations Manager. That role is (at time of writing) to be advertised shortly.

5.15. Finally, acknowledging the 40 year contribution that Kairanga-based works staff member Mark Metcalfe has made to river management both with the Manawatu Catchment Board and Horizons. Longevity is a common thread with Kairanga staff – although close to retirement works staff member Gary Jenkins is around 18 months away from a 50th work anniversary.

6. INVESTIGATIONS AND DESIGN

6.1. This reporting period has seen work on a range of projects progress, along with technical advice to a wide range of internal customers and external parties. The following summarises the work that the Investigations and Design team has undertaken over this period.

LMS – APPLICATION OF DAM ASSESSMENT GUIDELINES TO PALMERSTON NORTH STOPBANKS

6.2. During this reporting period, consultants T&T have continued to progress this project. Following the Failure Modes and Effects Analysis Workshop, T&T have provided draft outputs that staff have provided comment on. These outputs will be used to inform the development of surveillance and maintenance procedures. These procedures will ultimately be incorporated into the LMS Operations and Maintenance Manual that is being developed separately.

SEDIMENTATION IN THE LOWER MANAWATŪ AND OROUA RIVERS

6.3. This project is being carried out in collaboration with the Science and Innovation, and Information Management teams.

6.4. Consultants T&T have continued to progress this project and have provided an initial draft of their report for staff comment. The project final outputs will be delivered by the end of this financial year.

MANAWATŪ THROUGH PALMERSTON NORTH 2-D MODELLING

6.5. As presented at the last Catchment Operations Committee meeting, WSP OPUS have largely completed the modelling of the City Reach of the Manawatū River. A draft report of their findings is currently being reviewed by staff. As discussed at the previous meeting, the modelling has been a complex project and the final deliverables will be available to inform a number of river management decisions in the future. Given the importance the

model will have in some key decision-making it is intended to obtain a peer review to confirm it's suitability before being used by staff.

MANAWATU DRAINAGE NETWORK ANALYSIS

6.6. This work has been delayed due to resource constraints; consultant with the requisite expertise have been short-listed with an interactive tender process to take place in June. The initial focus will be on key parts of the network.

KOPUTAROA SCHEME REVIEW

6.7. Staff have continued work on this scheme review primarily looking at how the scheme will need to function to meet changing and evolving expectations and demands over the coming years. These challenges include those driven by changing community expectations in terms of environmental management as well as those related to the predicted economic growth in the Horowhenua District and the likely changes in land use.

6.8. The continuing development of the scheme review was presented, by staff, to ratepayers at the Koputaroa Scheme Meeting in March. This meeting provided valuable feedback that will help to inform the review and its recommendations.

MANAWATŪ & OROUA GRAVEL RESOURCE STUDIES

6.9. The Lower Manawatū Gravel Resource Study has been completed and is presented as a separate item to this meeting. The development of this report has proven to be time consuming due to the large amount of data associated with understanding changes to approximately 100 km of river channel.

6.10. The analysis of cross sectional information for the Oroua Gravel Resource Study has now been completed and production of the report has begun. The report will be completed and presented to the next Committee meeting.

REID LINE FLOODWAY MODELLING

6.11. To inform the Reid Line Floodway Upgrade Project, engineering consultants Jacobs have been engaged to build a 2-dimensional model of the floodway. The modelling work has now largely been completed and staff are currently reviewing the report and model outputs. This work will be used to refine the land acquisition requirements.

ASSET MANAGEMENT

6.12. During this reporting period, staff have begun the capitalisation of new assets as part of the year end processes. Additionally, work has begun on the revaluation of our infrastructural assets to meet the year end requirements of audit.

HAZARD MAPPING – UPPER MANGAONE & EAST OF LEVIN MODELLING

6.13. Staff have begun the procurement process to engage a consultant to carry out this work. The modelling work forms part of the cross-organisational Hazard Mapping Project. The work will produce models that will provide information about the flood hazard in these two areas.

MATARAWA SCHEME

6.14. During this reporting period, staff have worked with the Northern Area team looking at the potential to increase the amount of flow diverted from the Matarawa Scheme during a flood event.

6.15. The outcomes of this work, which will be delivered in the next month, will help to inform the future management of the Matarawa Scheme, which is of interest to WDC and the future development of the eastern areas of the city.

REGULATORY ADVICE

6.16. During this reporting period, advice was provided on a number of substantive matters. This regulatory work has included specialist advice on flood risk and the production of technical reports for consent applications, rezoning and subdivisions.

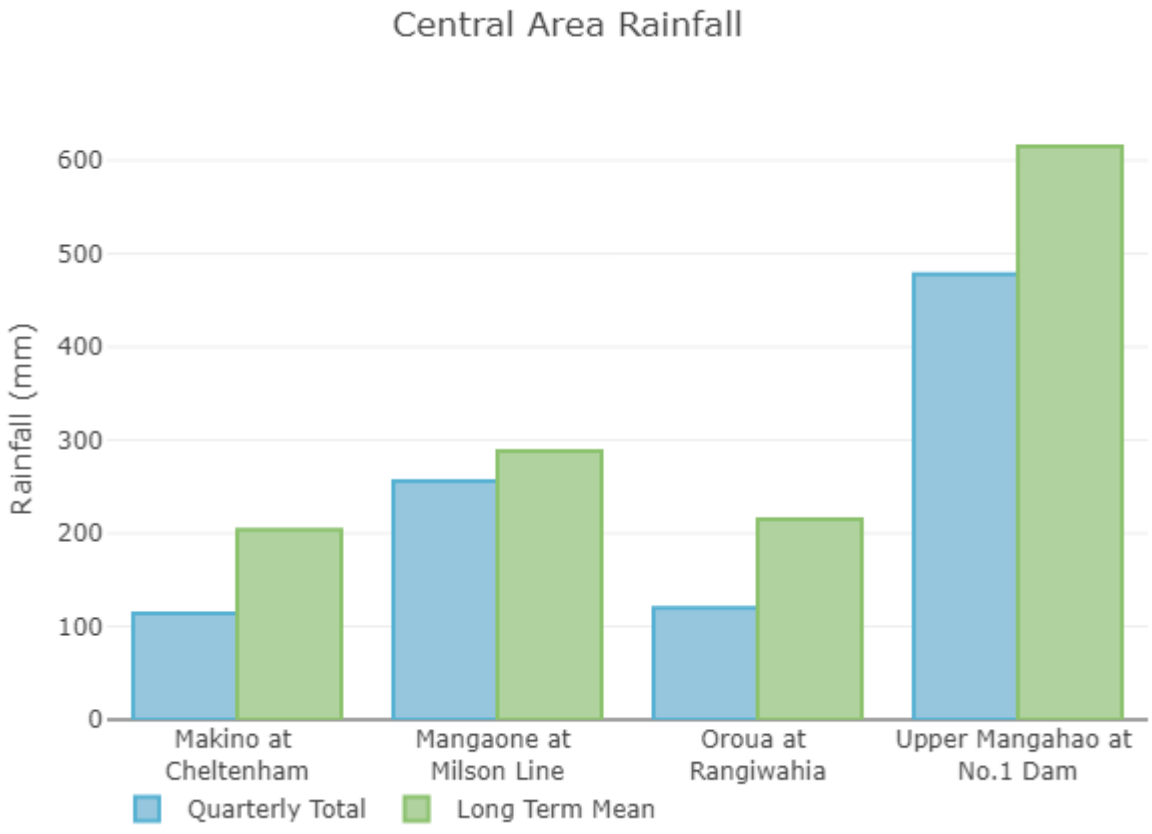
LOWER MANAWATŪ SCHEME RURAL FLOOD PROTECTION UPGRADE PROJECT

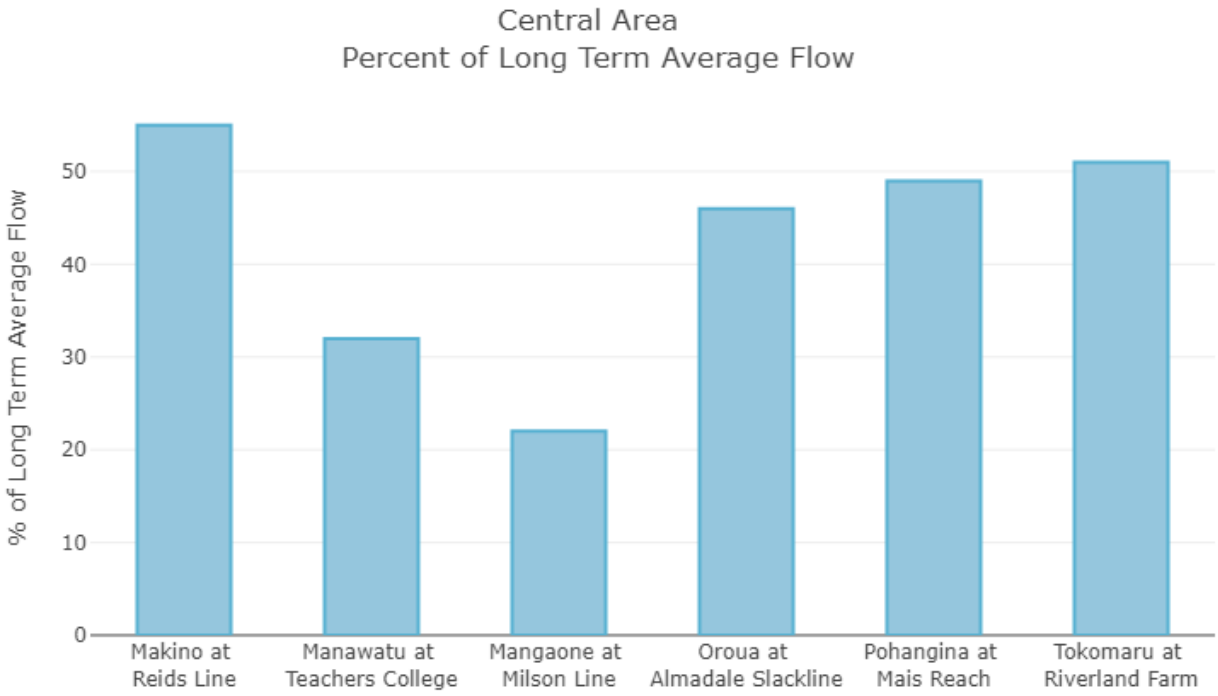
6.17. In regard to progress made on the Rural Upgrade Project – a summary of 2018 and what 2020 holds is presented as a separate item.

7. CENTRAL AREA

GENERAL

7.1. This reporting period was characterised by prolonged dry spells broken by infrequent and light periods of rain. This has resulted in consistent, very low flow in the river systems.





LOWER MANAWATŪ SCHEME

7.2. Works undertaken on the various rivers within the scheme this period include the following.

MANAWATŪ RIVER

7.3. The defects liability period expired and final completion was certified mid-May for work to protect the domain and State Highway 3 Bridge at Ashhurst. Further work is planned for the Pohangina confluence to help stabilise the river's course and reduce erosion of the vegetated gravel bar upstream of the rock groynes. In the short term, these works will include rope and rail fences with tied trees, as well as additional planting. In anticipation of future works, rock will begin to be stockpiled over the coming winter months.

7.4. The pedestrian bridge over the Manawatū River is nearing completion, with the official opening being scheduled for 7 June. Staff continue to work closely with **Palmerston North City Council (PNCC)** concerning this structure as well as those over the Turitea and Kahuterawa Streams, and the connecting paths, all of which are continuing to progress well and near completion.

7.5. Engineers have continued maintenance tasks along the Manawatū River, floodway; and around the Moutoa Sluice Gates and Tower. This has included continuing the rural mowing programme, undertaking minor stopbank repairs and hard facing of ramps. An electrical warrant of fitness was undertaken on the Moutoa Sluice Gates and a steel beam has been replaced on Gate 8 as part of the programmed renewal of the structural and mechanical components.

7.6. Programmed vegetation maintenance works continued along the lower reaches of the Manawatū River. This work involves the layering and/ or mulching of the existing willows to

control their size while maintaining a strong root structure. This live vegetation provides cost efficient bank stability and is the first line of protection against river edge erosion. The area of work over the period was the true left bank of the Manawatū River upstream and downstream of the Koputaroa #1 and #2 Pump Stations. Repairs to the stopbank were completed at various sites in the same location.

7.7. An erosion site on the true left bank of the river at Aokautere was repaired using concrete riprap material which had been stockpiled last reporting period.

7.8. The spray programme for the inside of bends has been completed from the Opiki Bridge downstream to the Whirokino Trestle Bridge. This is to reduce unwanted plant growth on the inside of bends. This vegetation growth can cause obstructions of flow which in turn encourages siltation, pushing beaches further into the channel applying more pressure on the outside bends of the channel; in many cases, the stopbank is located close to the riverbank.

7.9. The access track through the willows upstream of Te Motu-o-Poutoa (Anzac Cliffs) has been hard-faced, within the river parcel area, in attempt to regain vehicular access to the rock lining for maintenance. The stream crossing is particularly treacherous, and additional bed armouring will be required to access the berm at Anzac Cliffs. Spraying has been arranged in the meantime using a backpack rig.

7.10. A design is being sought from the River Management Design team as a result of a recent survey that confirmed significant damage had been sustained to the Anzac Cliffs snub groyne. A general rock stockpile is being slowly replenished near Awapuni to enable these and other repairs and works to be undertaken when possible.

7.11. Staff are continuing to monitor and identify potential solutions for the erosion adjacent to the stopbank at Hartley Street, Foxton Beach. Berm erosion has been a slow but ongoing issue in this area that has been caused mainly by wave action at high tide. Finer material is being washed out from behind assets placed to try and prevent erosion. The many attempts made over the years are evident, using various approaches/ materials with varying degrees of success.

7.12. The final meeting of the He Ara Kotahi Working Party was held on 28 June. Despite a number of challenges and given the wide spread of representatives (PowerCo, PNCC, **New Zealand Defence Force (NZDF)**, **Rangitaane O Manawatū (Rangitaane), The Property Group (TPG)**, consultants and Massey University) the working party functioned extremely positively and constructively and provided good communication throughout the project.

7.13. A consultant has been engaged to design the waka boat ramp at Ahimate, the remaining Special Project (in current form) task for the Manawatu. The design consisted of a concrete slab being poured in-situ in the river. The consultant proposed that the concrete would be poured in the dry, in a lined and bunded area, with several lined decanting areas that would control concrete runoff. Horizons approached Rangitaane in the first instance to discuss whether they were comfortable with pouring concrete in the river. Rangitaane took it to a Hui and confirmed that even though the risks could be minimised, they were not comfortable with the proposal. The consultant has returned with an alternative proposal using steel columns that would need a geotechnical investigation, the design of which they estimated would be in the region of $80,000. An alternative, affordable proposal based on the Ashhurst River access using rock is currently being investigated.

OROUA RIVER

7.14. Eight loads of concrete has been placed on the true left bank at 25.6 km. This is to reinforce the bank on an outside bend which is close to the adjacent stopbank. Concrete was placed with a 20 tonne excavator and adjacent willows were layered over the concrete for added protection.

7.15. Several repairs to the Kopane Spillway guide banks have been undertaken.

7.16. Mulching and layering has been undertaken over a 1 km stretch upstream of the Kopane Bridge on both the true left and true right bank. During this process, undesired willow and wattle growth was removed from berm land as this growth obstructs flow and encourages siltation of the channel.

7.17. Concrete has been sourced and stockpiled in multiple locations to be used for the future construction of bank protection work.

7.18. Channel improvements have been undertaken at two historically problematic corners between 29 km-30 km on both sides. While equipment was on site, undesired wattle growth was also removed.

7.19. A floodgated culvert has been installed directly downstream of the State Highway 3 Road Bridge on the right bank. This has been installed as in medium flows, the drain located there backflows. This causes the floodgate upstream to close and forces high velocity water along the stopbank and adjacent berm land. This leads to scour on the stopbank and unnecessary flooding of the berm land. As part of this work, the original edge of the drain will be reinstated and a repair to the stopbank will be completed.

7.20. A minor stopbank improvement on the true left bank at 29 km has been undertaken to even out an undulating section of bank and to widen a problematic gateway.

MANGAONE STREAM

7.21. The Mangaone Stream is inspected regularly by scheme engineers and, overall, remains in a good condition.

7.22. Stopbank improvements and repairs have been undertaken on the left bank opposite Palmerston North Airport. These improvements include filling and re-grassing of holes and the reshaping of a collapsed bank shoulder.

7.23. Two loads of concrete have been placed on the true right bank on a sharp right angle corner. This concrete has been used to create a solid toe on the corner to stop current erosion and prevent further erosion.

7.24. A maintenance run has been undertaken from Flygers Line to Setters Line. This includes debris removal, replacing and moving of disturbed protection works, and channel alignment works.

7.25. Maintenance tasks including mowing and spraying have continued within the City Reach. This reporting period saw a sudden increase in rabbits, and rabbit burrow damage to the stopbank between Flygers Line and Rangitikei Line. Poison was deployed and the burrows were filled in at the earliest opportunity. The area is continuing to be monitored for any reoccurrences.

7.26. The section of stopbank near Amberley Avenue which was found to have been sprayed last reporting period, has been hydroseeded and growing well. A further nearby section of

stopbank has also since been hydroseeded. Un-vegetated stopbank batters increase the risk of erosion and stopbank failure occurring.

MAKINO STREAM

7.27. The programmed maintenance works on the Makino Stream has been completed.

7.28. Works commenced at the Awahuri 1 km location, and continued upstream past Boness Road, Kitchener Park, Kowhai Park, through Feilding Township, Port Street, Roots Street, Reids Line West, the Diversion Structure, and up to the northern scheme boundary.

7.29. Works consisted of machine cleaning the stream channel by removing any flood debris, mulching any unwanted vegetation, and relocating any gravel build-ups causing erosion problems. Any other vegetation or weed growth was spot-sprayed.

STONEY CREEK

7.30. The annual maintenance programme was completed on Stoney Creek over this reporting period. This included the machine cleaning of the stream channel to remove any flood debris, unwanted weed growth, slips of the channel edge, and the removal of excess gravel build-ups causing a loss of flood carrying capacity and/ or erosion.

7.31. The existing stopbanks and berms were mown.

7.32. An existing rock lining was upgraded and extended. A new gateway was installed at the same location to allow access between neighbouring properties.

LOWER KIWITEA STREAM SCHEME

7.33. Several programmed maintenance type works were completed prior to the start of the trout spawning period which includes; spraying the channel to control weed and/ or vegetation regrowth on existing beaches, layering or mulching willows, removal of wattles that were restricting the growth of willows.

7.34. With only minor floods or freshes occurring in the Kiwitea Stream so far this financial year, the bulk of the budget has been spent of the maintenance type works. The scheme is physically in great condition, and well able to handle the coming winter conditions.

ASHHURST STREAM SCHEME

7.35. The annual spray programme through the township was completed. The length of drain in the rural area upstream of Wyndham Street was machine cleaned. A length of erosion at the top end of the scheme, at Ulysses Road, was repaired using concrete riprap.

7.36. Downstream of Napier Road, an existing rock lining was repaired and extended, plus a length of stream bank was mulched to remove unwanted weed regrowth.

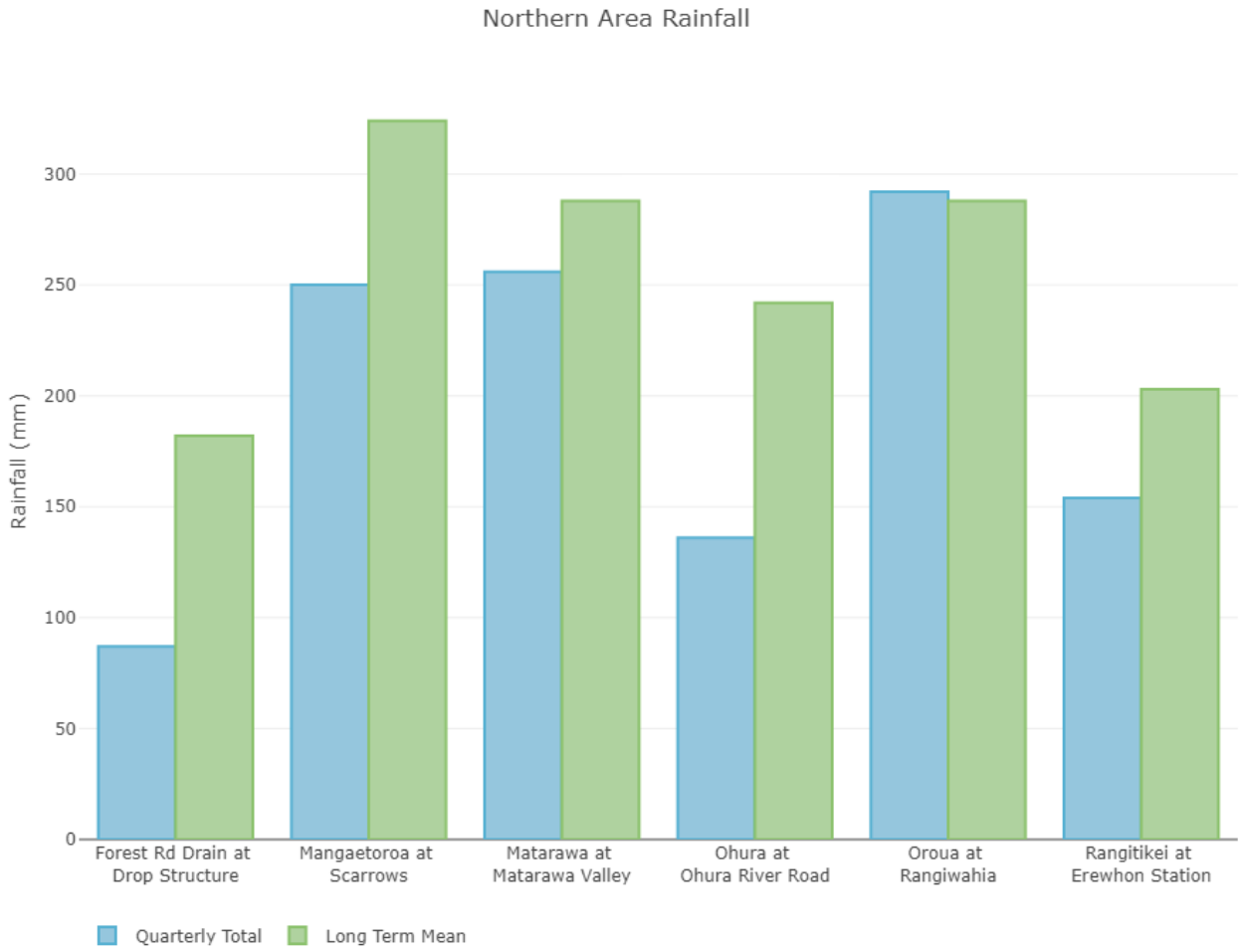
7.37. The intercepting drain (Barnes Drain) upstream of North Street was also sprayed for weed growth.

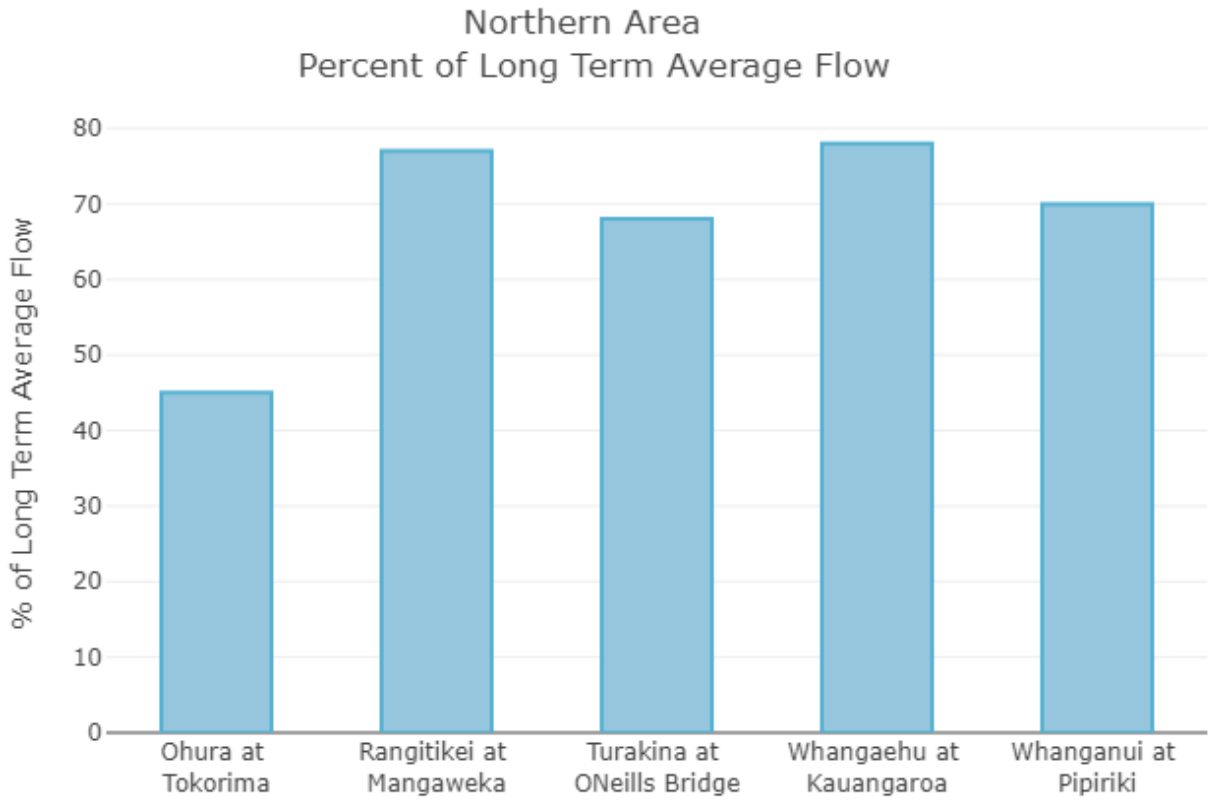
8. NORTHERN AREA

GENERAL

8.1. The very dry and warm autumn weather conditions and low river levels have allowed staff to complete almost all of their planned work for the year. Flood damage repairs from last

winter are now largely complete with only a few sites are still being worked on in the Pohangina-Oroua Scheme. We now generally have only routine maintenance work ahead of us to year end. Staff will now concentrate on asset inspections and end of year reporting before we once again ramp up for the planting season.





COMMUNITY INVOLVEMENT

8.2. The 2019 Swim Spot Spruce Up upgrade at "The Channels" in Taumarunui is progressing well.

RANGITIKEI RIVER CONTROL SCHEME

8.3. The very favorable dry autumn conditions have enabled staff to continue uninterrupted on scheme works completing an impressive volume of work. We have now completed all programmed maintenance work and the planned repair of damage caused during last winter's flood events. The largest of these works being the diversion of the river at Tonui bend and the associated bank protection works required to prevent an avulsion of the river into the berm land adjacent to the stopbank. Funding for these repairs is being assisted by a reserves drawdown of $450,000 in the current financial year.

8.4. Staff continue to develop a management strategy for the Rangitikei River, with the intent of bringing this to the September Committee meeting. As part of this strategy, staff continue to look at new and innovative options for channel management and erosion repairs. The establishment of field willow nurseries emphasizes the future direction towards soft engineering and vegetative solutions.

RANGITIKEI MAINTENANCE WORKS

8.5. April was a month spent finishing off work tasks and reprioritizing work programmes to maximize the benefit from the schemes remaining budget.

8.6. **ONEPUHI-** Work to open up Paul Murphy's existing irrigation channel along the right bank as a high flow channel is working well. We now have about a third or more of the flow using

this channel with planned erosion now eating away at the mid-channel gravel island. This work is important as the diverted flow helps reduce pressure on productive farm land located along the left bank.

8.7. **CAMPION ROAD/ TONUI FARM EMERGENCY WORKS-** Work on diverting the river away from the right bank and the risk of avulsing through berm land near the stopbank is progressing well. The second diversion has been completed and work to create the third has just commenced.

8.8. Total gravel extraction volumes are 15,015 m^3 from Diversion 1 and 15,560 m^3 from Diversion 2. The installation along the old left bank of 350 m of tied tree work protection, a bund and fence have been completed at a total cost of $106,993.20 (excl. GST).

8.9. **RATA RUBBISH DUMP, PUTORINO ROAD-** Gravel extraction by Winstone Aggregates to form a diversion away from the Rata Rubbish Dump has been completed. Initially all flow was passing through the diversion but as time passes we are experiencing more of the river creeping back into the old channel as small freshes break down the bunding. We will reform the bund again before winter after which additional costs to divert the flow will lie with the RDC.

8.10. RDC have advised that they have engaged consultant to identify and cost solutions. We have used their survey drone to map and estimate gravel extraction volumes that are now stockpiled and awaiting processing.

8.11. **PLANTING & NURSERY MAINTENANCE-** Approval was given to purchase a small mower that tows behind a quad bike for field nursery maintenance. Both Kakariki and Haylocks field nurseries have been mowed ready for the pole harvesting season. The new mower performance at both these sites has been very impressive.

8.12. **STOPBANKS-** First week of April the stopbanks were mowed ready for winter.

8.13. **FORESTRY-** Insurance and Revaluation 2019 was undertaken.

8.14. **IWI CONSULTATION-** Staff gave a presentation to Ngā Puna Rau O Rangitikei meeting on 17 May regarding the future strategic direction/philosophy for the management of the Rangitikei River.

8.15. **RANGITIKEI RIVER ENHANCEMENT-** Wire rope has been stolen several times from the Kakariki knee breaker fence. This was replaced to stop damage to the stopbank and fuel from being stolen from Rangitikei Aggregates.

8.16. **LAYERING-** Work to complete layering at John McManaway's has been delayed due to the re-prioritising of end of year budgets. Work will recommence in the new financial year.

8.17. **TANGIMOANA FLOODGATE TRAINING-** Held on 29 March to test the installation and fit of the Tangimoana floodgates. As a result, there has been some minor alterations to the gates. The training was attended by the northern River Management team, contractor Andrew Morriss, Traffic Management NZ, & Emergency Management staff from Horizons & **Manawatū District Council (MDC)**.

RANGITIKEI CAPEX WORKS

8.18. **2018-19 PAREWANUI STOPBANK UPGRADE-** The Parewanui stopbank upgrade work is located on Walmac Farm near Scotts Ferry from river distance 3 km to 4 km. The contract saw 500 m of stopbank upgraded, within budget, by Holland Earthmoving Ltd. Work

commenced on 14 January 2019 and Practical Completion was awarded on 25 March 2019.

8.19. A request for proposal was sent out on 22 November 2018 for the design of a concrete wall to span the section of stopbank that intersects the high pressure gas main. Interest was sought from five engineering firms with only one tender received from consultant GHD. Their proposal was accepted and signed on 12 February for a value of $48,970. Draft design has now been received and will be peer-reviewed given the criticality of the structure. Tender documents for concrete wall construction will be compiled in June with construction planned for late in the 2019 calendar year.

8.20. **GRAVEL EXTRACTION SITES – GBC WINSTONE-** No gravel extracted from the scheme consent this reporting period.

8.21. **RANGITIKEI RIVER GLOBAL GRAVEL EXTRACTION CONSENT-** a planning consultant has been engaged to prepare and lodge a global resource consent application to enable gravel extraction, for river management purposes, from the Rangitikei River over a series of reaches extending from the Makahikato Stream to the mouth of the river. A draft application is being prepared and will be ongoing while consultation takes place.

POHANGINA-OROUA RIVER CONTROL SCHEME

8.22. An impressive volume of flood repair work has been completed following the 12 June 2018 flood event. Currently we have spent well over $600,000 which is nearly 50% more than our normal annual budget with further work identified. At the annual scheme meeting it was recommended that a further $150,000 be drawdown from the Emergency Reserve fund and added to the previously approved $200,000 to ensure essential repair work to protect landowners property is completed before winter.

POHANGINA RIVER

8.23. The June 2018 flood event repairs continue at several locations on the upper Pohangina River. The largest of these works being on the Carrol and Passey properties.

8.24. At the Carroll property, a troublesome repair site has been beefed up with rock groynes and further enhanced with the completion of downstream treebank protection work.

8.25. The Passey property experienced about 150 m of extensive right bank erosion that had severely damaged a landowner constructed stopbank. In partnership with the owner, we have tried a new innovative repair option. The first 100 m of repair utilized conventional tree bank protection work techniques while the final 50 m was protected using a geotextile mattress construction technique. While this has only recently been completed, the results look very promising and staff will monitor the performance of the mattress over the period of higher river winter flows.

8.26. We are soon to enter our planting period with both these sites identified for willow pole installation to provide further protection from bank erosion. Willow stocks for harvest are becoming hard to find on both the Oroua and Pohangina Rivers with staff now looking at establishing field nurseries to help meet the future supply demand.

8.27. **GRAVEL EXTRACTION-** 1,200 m^3 of gravel extraction has occurred from the Pohangina River this reporting period.

OROUA RIVER

8.28. No major work has been done on the Oroua River other than some channel maintenance work at the Hoggard property. We are however looking to get back over and work on the upper reaches when we revisit the erosion repair sites at the McDougall property. This work was only stabilized after the last flood event and a more permanent solution using tree bank protection work and groynes is to be used. Additional repair sites have been identified at Robert Silks' property just opposite McDougal's on the left bank. This will also require tree bank protection work and possibly a rope and rail groyne. It is currently under investigation and pricing. At Genets' and Milns' properties, repairs need assessment and further repairs, but this will be dependent on the year's remaining budget. There is also minor tree removal work to be done at Griffith's property near the Almadale Reserve.

8.29. **GRAVEL EXTRACTION-**1,677 m^3 of gravel extraction has occurred from the Oroua River this reporting period.

TOTARA RESERVE

8.30. No significant work undertaken at Totara Reserve during this period.

UPPER WHANGANUI RIVER MANAGEMENT SCHEME

8.31. The Lines Company and Horizons entered into a joint venture to maintain willow growth under the main power supply feed to Taumarunui, along the left bank of the Ongarue River, at the Western approach to Taumarunui. Treescape were engaged to undertake the works for us, operating under our Code of Practice, and envisage being finished late May.

8.32. Funding for a fence along the right bank of the Whanganui River, at the end of Porou Street, has been granted, with the cost being shared between the Fresh Water team and scheme funds. The lease holder appears to be content with the arrangement. Once an appropriate contractor is found for installation of the fence, work will begin at the earliest convenience.

8.33. Taumarunui Hire Centre has several maintenance jobs on the cards for us and is presently completing them. These include drilling and poisoning of wattles, layer of poplars (predominantly upstream of Cherry Grove) and removal of debris piles (previously generated after clearing and layering works around Manunui).

8.34. **RUAPEHU DISTRICT COUNCIL MEMORANDUM OF UNDERSTANDING-** A first draft of the **Memorandum of Understanding (MoU)** was completed in January. Comments were sought from **Ruapehu District Council (RuDC)** and amendments made accordingly. Final sign off was 12 February 2019. The MoU is for work that is outside of RuDC's scope and adjacent to Horizons' assets. Work is currently underway repairing flood damage to the Pungapunga River left bank berm above Manunui. Also underway is the upgrade of stormwater culverts through Upper Whanganui Scheme stopbanks. The contracts will be managed by Horizons on behalf of RuDC.

8.35. **PUNGAPUNGA BERM REPAIRS-** This work is being undertaken for RuDC with all costs fully funded by them. An area of left bank berm experienced severe erosion damage threatening the adjoining stopbank when river flow during a flood event was diverted by a fallen tree.

8.36. The contract involved three compacted fill layers of gravel/ rhyolite, clay substrate and topsoil plus a rock armour face over a length of approximately 60 m. Contract tender

documents were out for the period four weeks prior to 12 February 2019. Two tenders were received and tender evaluation/ selection conducted over the period 18 February to 18 March. The work has been completed under budget. Practical completion was awarded on the 13 May 2019.

8.37. **RUAPEHU DISTRICT COUNCIL CULVERT UPGRADES-** RuDC have engaged Horizons to install upgraded culverts through the schemes stopbanks in Taumarunui. An indicative engineer's estimate for the upgrade of the Taupo Road and Tuku Street culverts has been provided along with an analytical assessment of the inundation levels. Location of services has been completed and preliminary plans have been developed. Tender documents will be compiled in June 2019 and let for tender following this.

MATARAWA FLOOD CONTROL SCHEME

8.38. **MATEONGAONGA STREAM-** Further vegetation clearance has been completed on the Mateongaonga Stream to remove remaining willows from the stream bed.

8.39. **DRAIN SPRAY-** A drain spray was completed in May.

8.40. **MATARAWA URBAN-** Apart from continued bamboo control work and a small channel clearing job just upstream from the ANZAC Parade Bridge, the work on the Matarawa has been completed this financial year. We are now planning the work programme for next financial year.

TUTAENUI FLOOD CONTROL SCHEME

8.41. A steady flow of gorse spraying and gravel relocation work has been completed over the last two months, both in the urban and outer rural sections of the stream. An area of stream in Station Road has been sprayed and minor gravel redistribution is being completed along reaches at both Trickers Road and at Crofton. No other major works are planned for this year other than fencing around various inlet structures. On the horizon is the possibility of some work adjoining the Field and Haycock properties near Bulls.

MAKIRIKIRI FLOOD CONTROL SCHEME

8.42. The lower channel clean, and floodgate repairs were completed between 15-22 May. This work was delayed from an early proposed start date, as access to the stream was restricted until the completion of maize harvest.

8.43. **MAKIRIKIRI FLOOD EGRESS GATE-** It was identified that the flood egress structure constructed in January 2017 requires modification. The gates are not sitting flush against the concrete walls. A solution has been established between Horizons and the contractor. The first half of the modifications were completed in June 2018 and the following alterations were completed in May 2019. A scribed rubber seal and additional bearing housings have been added to the structure for functionality.

POREWA FLOOD CONTROL SCHEME

8.44. **QUEENS PARK-** Tree blockages in the Porewa Stream at Queens Park, Hunterville have now been removed.

8.45. **DAM 75-** Vegetation and trees growing on the embankment of Dam 75 have been removed. Vegetation around the inlet and outlet have also been removed to allow the free flow of water.

WHANGAEHU MANGAWHERO RIVER MANAGEMENT SCHEME

8.46. A new resource consent for aerial spraying of the Whangaehu-Mangawhero Scheme is required. The new application has been prepared and is now with the Consents team for comment before being lodged officially.

TURAKINA RIVER MANAGEMENT SCHEME

8.47. Rangitikei Helicopters were engaged to undertake the aerial spraying of willow and poplar along the Turakina River in late March. The operation was undertaken over two days and resulted in the successful coverage of around 18 km of channel.

8.48. A log in the Turakina River, downstream of the SH3 Road Bridge, will be removed at the earliest convenience.

LOWER WHANGANUI VEGETATION MANAGEMENT AND FLOOD PROTECTION PROGRAMME

8.49. **SCHEME WORKS-** Repairs on Balgownie knee breakers, planterbox capping, stopbank ramps have been undertaken. Vehicle damage on the Kowhai Park stopbank by the Matarawa Stream has also been repaired.

8.50. Papaiti vegetation clearance has been delayed along with other work until a consent has been applied for and granted.

8.51. Asset inspections have been completed and will be entered into the system over the coming weeks.

8.52. **LOWER WHANGANUI RIVER INFRASTRUCTURE-** The North Mole and South Spit Interface Wall investigations have been completed with design of both commencing in July 2018. Provincial Growth Fund funding is still uncertain but project work is continuing as if construction were to occur in summer 2019-20.

To that end:

- Investigation and surveying of existing rock structure below and above water has been completed;
- Wave height modelling and assessment for rock sizing calculations has been completed;
- Conceptual design profile sketches for various batter treatment of the North Mole have been completed;
- Development of plans for the repair/ strengthening of the South Spit Interface Wall and the reinstatement of the Tanae Groyne have been completed;
- The survey and associated construction drawings for the interface wall and Tanae Groyne are completed;
- Public consultation has commenced;
- Terrestrial and Aquatic Ecologicval assesments have been completed with final reports received in May 2019;
- The identification of resource consent requirements is completed and the draft consent application is substantially complete; and
- Final design of the North Mole and revetment will be completed by the end of July 2019.

Tasks that will be progressed over the next two months include:

- Development of construction methodologies and estimates;
- Obtain firm expressions of interest for rock supply, particularly from Whanganui District Council at Waitahinga Quarry;
- Notification of identified claimants for customary marine title and seek opinions;
- Seek opinion and approval from Te Pou Tupua around specific proposals at the two works sites;
- Consultation with Maritime NZ; and
- Input as required to progress the Port Revitalisation and River Control Infrastructure Business Case.

Concerns that have arisen are:

- Availability of suitable rock in large volumes; and
- Potential consenting/consultation issues or timeframes.

PAKIHI SCHEME

8.53. Installation of a new inlet screen at the Frew Dam was completed in late May.

FOREST ROAD DRAINAGE SCHEME

8.54. Drain spraying was completed in April. Two gates were installed on the AgResearch drain to allow more efficient access for spraying. These gates are padlocked and must remain locked for security reasons.

8.55. Landowner Roger Dalrymple has advised that they are happy to continue maintenance of drain 535000. This arrangement has continued for the last six years and fits in well with their farm management. Massey University also have a research project located on the drain that measures the flow of nutrients into the drain.

HAUNUI DRAINAGE SCHEME

8.56. All the scheme drains were sprayed in April.

8.57. No other worked is planned for this financial year.

OTHER WORKS

NORTHERN ANNUAL SCHEME REPORT

8.58. Each year an annual report is prepared outlining the activities, and financial standing of the 14 schemes in the northern area for the previous financial year. Work on the 2016-2017 report remains underway.

ENGINEERING ADVICE

8.59. During the last two months, there have been continued requests for advice on a variety of issues including rural flooding in non-scheme areas, involving clearing blocked culverts, clearing stream channels of vegetation and fallen trees, diversion queries, compliance issues and flood damage work. Two requests that are taking up considerable time are neighborly drainage issues in Westmere, Whanganui and at the Turakina Presbyterian Church.

MOAWHANGO RIVER

8.60. Genesis Energy-funded work is complete for the year.

9. EASTERN AREA

GENERAL

9.1. The generally dry weather has continued, with all rivers in the district well below average flow levels. There have been four moderate rainfall events over the last two months, which have been centred on the Tararua ranges and consequently, have had the greatest effect in the Mangatainoka catchment. For the rest of the district, river levels have remained static and very low for this time of the year.

9.2. Staff have been busy undertaking the works programme for the Mangatainoka and Tararua River Management Schemes. Work has also been progressing in the South Eastern Ruahine Scheme area, particularly on the Oruakeretaki River, where erosion has meant that repairs have needed to be carried out. There has been some significant degradation of bed levels in this river and most of the entire length of this river, from the gravel reserve to its confluence with the Manawatū River, has required work.

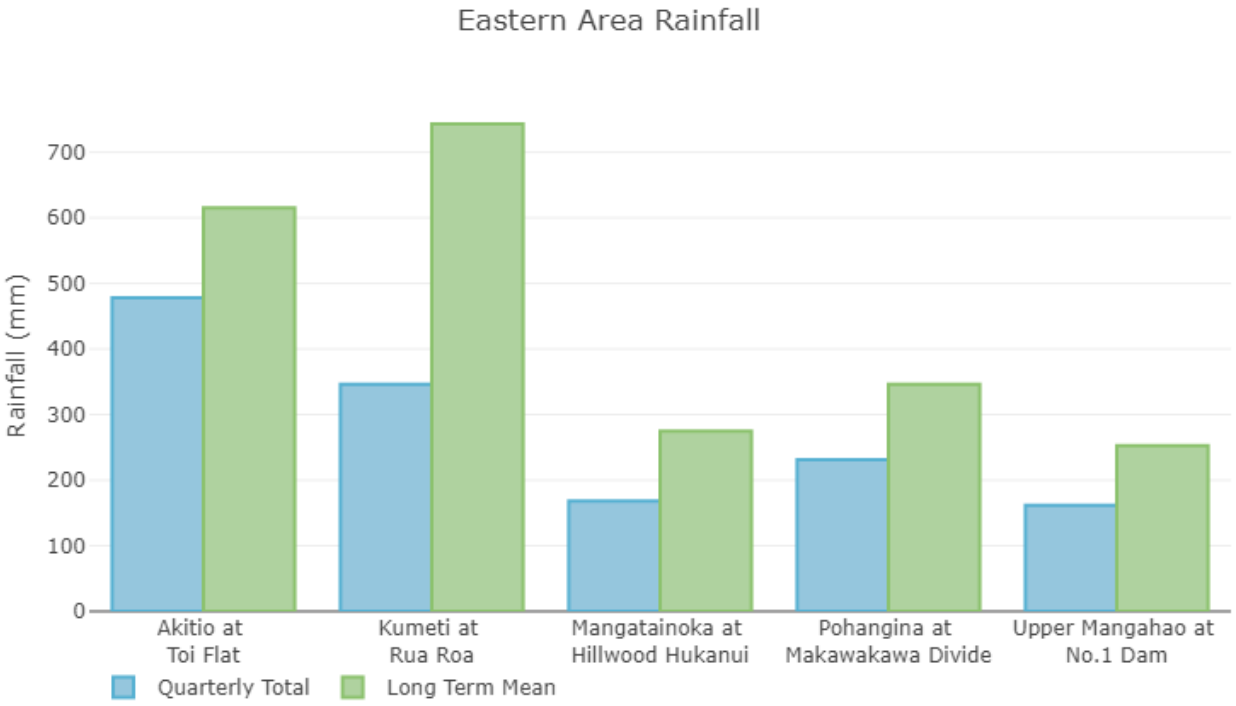
9.3. The Community Catchment meetings for the Mangatainoka, South Eastern Ruahine and Upper Manawatū – Lower Mangahao Schemes were held in early March. These were generally well attended, though mostly by scheme committee members. Good discussion was had on a range of topics that were applicable to each scheme and a number of actions were generated for follow-up.

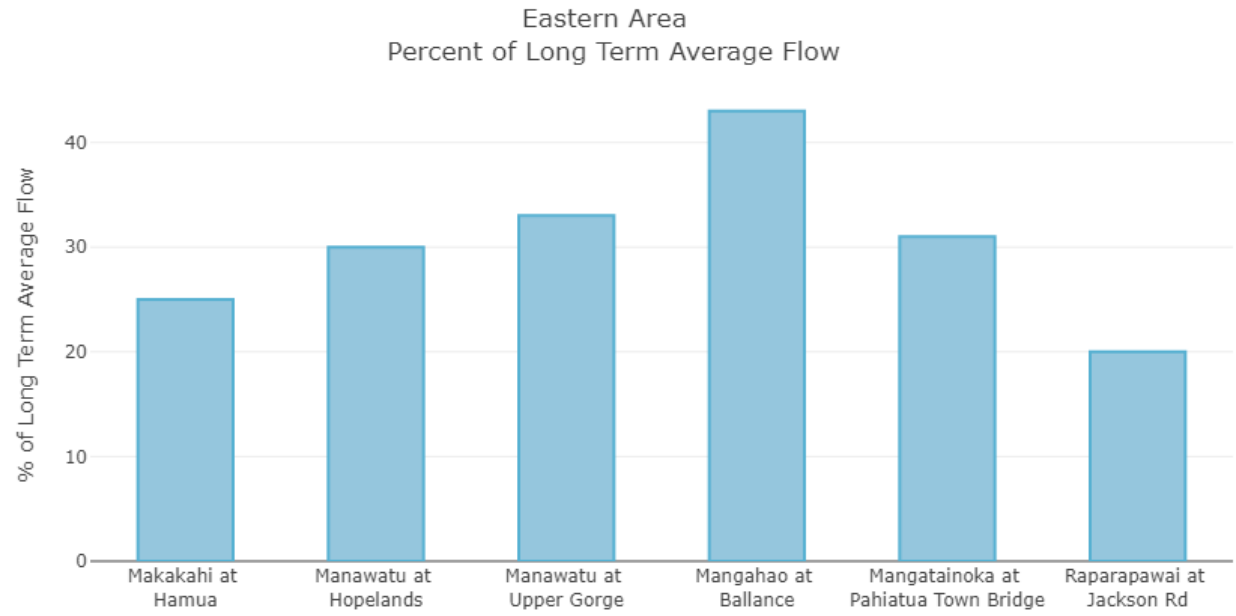
9.4. Meetings have also been held with the four community boards/groups within the Tararua District to seek nominations to positions on the community liaison group identified in the Tararua River Management activity plan. Meetings have also been held with Federated Farmers and both Iwi in the Tararua District. The first meeting of the group is due to be held in mid-June.

9.5. Staff have also been involved in working with Ngāti Rangitāne o Tamaki nui a Rua on the Source to the Sea Project and have been involved with amenity enhancement around the Source, Bluff Road and Ferry Reserve. Staff also participated in the morning blessing of these three sites and hosted all participants for morning tea at the Woodville Service Centre.

9.6. Staff have further been involved with presenting scheme strategies to the leadership team of Ngāti Rangitāne o Tamaki nui a Rua as part of the Te Kaauru o Tu te Manawa subgroup. This has generated good discussion around river management activity going forward and how this impacts on cultural values for rivers in the district.

9.7. Requests for miscellaneous issues and engineering advice has continued over the last two months, with some of the issues raised being around the removal of debris from non-scheme rivers, erosion, fencing, the removal of landslide materials from waterways and potential environmental grant work.





TARARUA DISTRICT RIVER MANAGEMENT SCHEME

9.8. Spraying was undertaken at the Bluff Road and Norsewood Whare recreational areas as part of the drain spraying works to clear weed growth. Further work such as laying lime on the carpark area are planned for the Bluff Road site as part of amenity enhancement work.

9.9. Works have been planned to clear a 500 m stretch of vegetation on the Mangapuku Stream, where it crosses Weber Road – an area prone to flooding. It had come to the attention of staff that a resource consent was required to clear this vegetation, due to the scheduled status of the river, before works commenced. As such, staff have been working through a resource consent application. Due to changes within the Ngāti Rangitāne o

Tamaki Nui a Rua structure, a number of consultation meetings have been held to explain the nature of the work. All other affected parties, including Ngāti Kahungunu ki Tamaki nui a Rua, have completed their affected party signoff for the consent.

9.10. This has highlighted the need for Horizons to gain a recourse consent to allow for vegetation clearance and land disturbance along the riparian edges of rivers which have not previously been subject to a river management scheme, and affects a number of departments within Horizons. Work has begun on the process of applying for this consent.

9.11. As mentioned earlier, meetings have been held with each of the iwi, **Tararua District Council (TDC)** and the four community boards/groups within the Tararua District to solicit nominations for the Tararua River Management community liaison group. Nominations have now been received from all groups, except for Pahiatua on Track, and as such the first meeting will be held in mid-June.

MANGATAINOKA SCHEME

9.12. The tree groynes installed at the end of Te Hawera Road have been followed up with a large rock lining covering the rest of the bend. Due to the impracticability of properly battering the bank in preparation for a lining, more rock than usual was used. The job ended up needing a total of 1500 t of limestone boulders.

9.13. Further upstream, the area of gums that were cleared has been reinforced with permeable mesh units and tied trees. This was followed by mulching and clearing a further 6 km of channel upstream of the work. This clearing took our contractor through to Stirling Bridge. The left bank at this location has posed a significant problem for a number of years. However, works that were completed in the last financial year have stood up to seasonal flows and allowed a base for tied tree groynes to be installed. These groynes have had further loose material, from the beach opposite, placed around them to give them a bit more protection going into winter.

9.14. The annual drain maintenance cycle has also been completed.

SOUTH EASTERN RUAHINE SCHEME

9.15. Remedial works on “Aldersons Weir” on the Oruakeretaki River were completed before the end of April – stopping significant erosion of the true left bank.

9.16. Work on the neighbouring property upstream, to try and mitigate bank erosion before increased flows in winter, was also completed, as well as further works on three properties downstream of the weir. This has seen a significant amount of work done in the upper stretch of the river – including the placement of rock groynes and tied tree works to mitigate bank erosion.

9.17. Tree removal and vegetation clearance was also completed on a section of the Raparapawai Stream, to prevent congestion and blockage during high flows over winter.

9.18. Drain maintenance has been completed on the scheme and attention now move towards pole planting for winter.

9.19. A routine mulching programme is being planned to maintain these works going forward. This will start in the new financial year.

9.20. Asset inspections have begun in this scheme.

TAWATAIA - MANGAONE SCHEME

9.21. All work has been completed on this scheme for this financial year.

9.22. The interim dam inspection was completed by staff in March with no issues highlighted.

UPPER MANAWATŪ – LOWER MANGAHAO SCHEME

9.23. Work has essentially finished for the year on this scheme. Just over 90% of the budget has been spent so far and the remainder is being held back in contingency for any flood damage that may occur later in the year. It is predicted that the scheme will be in a financial position at the end of the year to make the budgeted contributions to the reserve fund, which it has not been able to achieve over the last two years.

9.24. There only two pieces of tree layering work to complete before the end of the financial year and these will be completed in May – June.

10. SOUTHERN AREA

GENERAL

10.1. Settled weather and good ground conditions have allowed our spray contractors to complete the majority of the autumn spray programme. Some isolated section of drains where access had been problematic still need to be completed but we are working with the landowners in these areas and these should be completed soon.

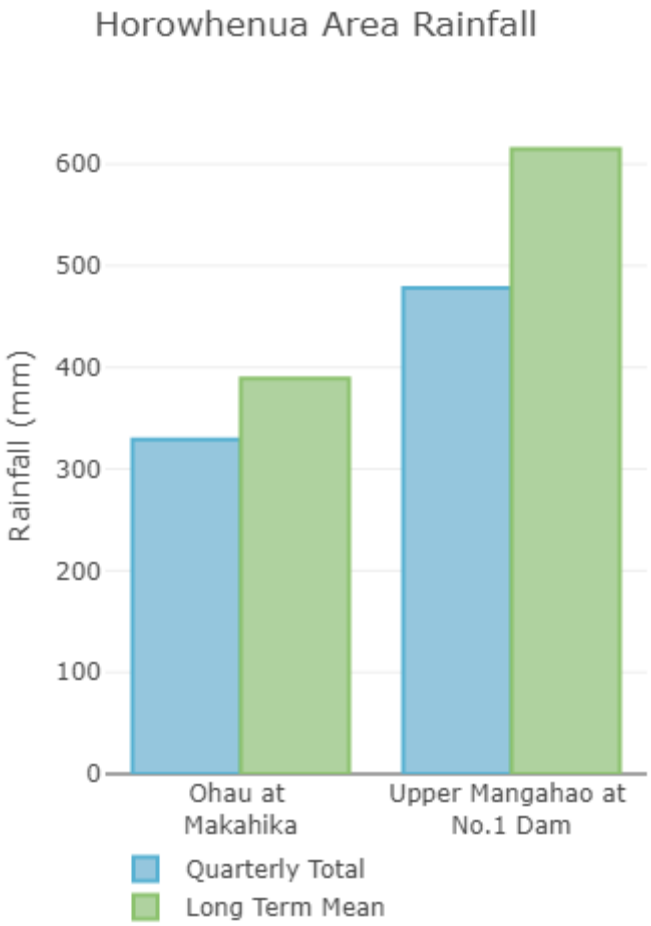
10.2. Request for engineering advice has continued over this period including a number of requests from district council staff around who is responsible for maintaining various drains around the area.

10.3. Daniel Parker from InSite Archaeology Ltd was invited to Kairanga to give a presentation to the Kairanga staff regarding the information that he has documented around the historic sites within the Horowhenua and Manawatū District and how this can impact on the activities undertaken by River Management. Daniel also provided an overview of the statutory framework (Heritage New Zealand Pouhere Taonga Act 2014).

10.4. Staff have been working with Council's Consents team to review the catchment boundary between West_6 (target catchment) and Mana_12c (non-target) on farms around State Highway 1 so that they can better understand the apportioning of farms between the target and non-target catchment.

10.5. Staff have been working with consultants Opus, to put together a new term maintenance contract for pump station electrical maintenance. This maintenance contract has now been advertised on Horizons' Tenderlink portal and is due to close on 21 June.

Staff continue to work closely with various other teams from within Council and consultants regarding the implementation of the new **Asset Management Information System (AMIS)**. Current focus is around asset inspection of River Management assets and enabling this information to be downloaded into the new system.


Horowhenua Area Rainfall
Rainfall (mm)
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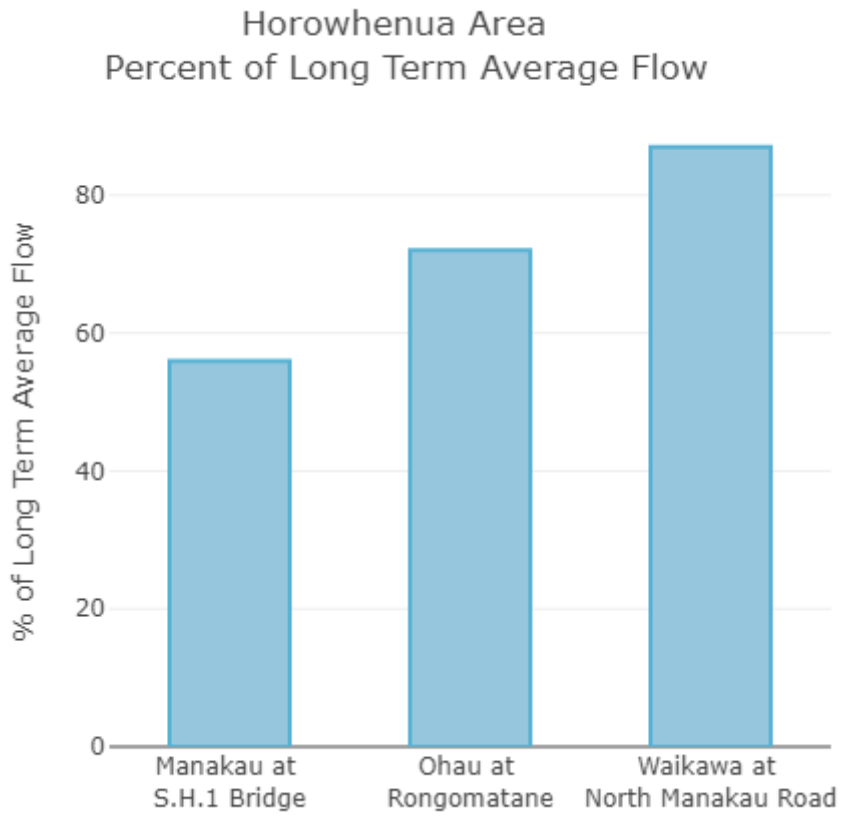
500
400
300
200
100
0
Ohau at Makahika
Upper Mangahao at No.1 Dam
Quarterly Total
Long Term Mean



ENVIRONMENTAL ENHANCEMENT

10.6. Staff continue to work closely with staff from the Freshwater and Partnerships team in identifying and assisting with the organisation of planting and fencing alongside scheme drains.

10.7. This period has seen a section of Railway Drain, in the Te Kawau Scheme, levelled off and a new culvert and gate way put in to allow the drain to be fenced. This will allow the Freshwater team to plant up one side of the drain.

10.8. A desire by staff to better understand the environment we are working in, part of an initiative to aquatic habitats in scheme drains has seen a network assessment carried out on the Koputaroa No.4 Pump Station catchment. This involved mapping the current network, identifying all the scheme drains and non-scheme drains that feed into the Koputaroa No. 4 system.

10.9. At the same time, all of the culverts were mapped and a preliminary assessment made on the potential for impediments to fish passage. Further work is required on this report to allow full understanding of the impact and the potential of the network which will involve input from other teams within Council. The intention is to undertake this review on each of the scheme pumping networks over the next few years and then use this information to drive some of the habitat improvement works in these areas.

OHAU-MANAKAU SCHEME

10.10. This scheme was very quiet for this time of the year. There was only a small amount of unsettled weather which has meant only a few high flows through the Ohau River and other streams.

10.11. 9.8 km of scheme drain was sprayed and 3.5 km machine cleaned.

10.12. Some annual inspections of floodgates were undertaken to take advantage of the low river levels.

MANAWATŪ DRAINAGE SCHEME

10.13. On 21 May, an inspection was held with a number of scheme ratepayers to look at some of the key maintenance issues associated with the drain upstream of pump station. The Scheme Liaison Committee and other key landowners in the vicinity of the Burkes Drain were invited to attend the meeting. The key areas of concern addressed were the weed build-up that occurs at the Rangiotu Road bridge holding up drain flow in larger events, a private access culvert across the drain, and the Carmody Drain Outlet. The tour provided an opportunity for the ratepayers to understand the issues and to discuss potential solutions.

10.14. A new aluminium 600 mm floodgate has been installed on culvert no. 26 along Burkes Drain, due to the old one rusting out.

10.15. Four large willow trees have been removed from Farmer's Drain, due to them causing blockages within the channel.

10.16. Large macrocarpa trees have been removed from Aorangi No. 1 Drain. They were blocking the drain and preventing it from being sprayed or machine cleaned.

10.17. This period has seen 40 km of drain sprayed with herbicide and 1.5 km machine cleaned, this will be the final spray round of the season.

10.18. Two culverts were replaced along Whiskey Creek as part of the renewal upgrade programme. In 2014, CCTV inspections were made of the Whiskey Creek culverts to assess condition. It was identified that five along Whiskey Creek would need replacing. This year we have upgraded two. One 600 mm culvert which we replaced with a 900 mm culvert. The other being a 450 mm culvert.

MAKERUA DRAINAGE SCHEME

10.19. Linton Drain has been machine cleaned with the long reach excavator to remove the submergent weed build-up. Boundary Drain was also machine cleaned.

10.20. 1.5 km section above the railway track of Waterfall Creek was machine cleaned. This drain is known to have high in-stream aquatic values - large numbers of eels. To minimise the impact on the eel population, a staff member followed behind the excavator collecting and returning the eels. Approximately 600 eels of varying sizes were returned to the drain.

10.21. A new 900 mm culvert was placed in Hill Drain due to the old culvert collapsing.

10.22. This period has seen 25 km of drain sprayed with herbicide.

KOPUTAROA DRAINAGE SCHEME

10.23. General pump station maintenance was undertaken this period which included spraying for weeds, clearing of weed screens etc.

10.24. 20 km of drains were machine cleaned and 13.5 km of drain were sprayed to remove weed build-up.

MOUTOA - WHIROKINO DRAINAGE SCHEME

10.25. An ongoing issue with the duty pump at the Pleuger Pump Station faulting on start-up has been investigated by our electrical contractor. A high amperage drawdown on start-up was found to be the cause of the issue. In order to identify the cause of the issue the pump has been pulled out for further testing. These tests have failed to identify the issue which will require further investigation of the electrical components and power cables.

10.26. Staff have begun the process of looking at what a replacement station might look like and cost, with a view to adding that work programme to the next update of Council's LTP.

10.27. The autumn drain maintenance programme was completed with 19.7 km of drain sprayed and 3.6 km machine cleaned.

TE KAWAU DRAINAGE SCHEME

10.28. This period the scheme drains are onto their second spray of the season. With 30 km completed to date.

10.29. Annual inspections of the floodgates have commenced with the Sluggish Main Gates.

10.30. A 300 m section of Johnson's Drain with significant slumping occurring has been machine cleaned and the banks battered back to stabilise the batter slopes.

10.31. A 2 km section of Mora's Extension Drain along Taikorea Road and along a section of Milner Road has been machine cleaned. A 900 mm culvert was lowered as it was too high and causing a back-up of water flow during heavy rainfall events.

HOKIO CATCHMENT DRAINAGE SCHEME

10.32. Several trees on the outside of a bend in the Hokio Stream had fallen into the stream due to it being undermined. The trees were removed and stockpiled to allow burning at a later stage.

10.33. This period saw 14.7 km of drain sprayed as part of the autumn drain maintenance programme.

FOXTON DRAINAGE SCHEME

10.34. This period saw 1.5 km of drain sprayed as part of the autumn drain maintenance programme.

HIMATANGI DRAINAGE SCHEME

10.35. This period saw 4.9 km of drain sprayed as part of the autumn drain maintenance programme.

11. SIGNIFICANCE

11.1. This is not a significant decision according to the Council's Policy on Significance and Engagement.

Ramon Strong
GROUP MANAGER RIVER MANAGEMENT

ANNEXES
There are no attachments to this report.

Report No.	19-87
Information Only - No Decision Required	

FISH PASSAGE UPDATE (PRD 04 07)

1. PURPOSE

1.1. The purpose of this item is to update Committee members on progress with improving native fish species populations in scheme drains.

2. EXECUTIVE SUMMARY

2.1. New Zealand has a unique and highly mobile native fish fauna consisting of a large number of migratory species. The majority of native fish within the Horizons' region are migratory in nature and therefore require access to the sea at some stage in their life cycle. The inappropriate placement of structures or type of structures can prevent that migration.

2.2. An incident occurred at a pump station in the Waikato in 2015 that resulted in a large number of eel deaths. A range of factors contributed to that particular incident, including the configuration of the station/ lake outlet, the operability of the station at the time of the incident, the very high ecological values of the water body, weather conditions and the influence of seasonal/ migratory factors.

2.3. Horizons' River Management asset inventory includes 22 land drainage pump stations, 1,100 km of drain and 540 floodgates. Although no large scale mortality events have been either observed or reported that relate to Horizons' River Management activities, scope exists to improve access to the network and reduce the potential for such an event to happen in the future. This item updates Item 18-95 presented to the June 2018 Catchment Operations Committee meeting.

3. RECOMMENDATION

That the Committee recommends that Council:

a. receives the information contained in Report No. 19-87 and Annexes.

4. FINANCIAL IMPACT

4.1. Improving fish passage to scheme drains has a cost that has yet to be fully determined. Note that most will be relatively small initiatives that form a part of routine operations and maintenance activity and as such are likely to be difficult to itemise separately. Clearly the focus will, for the most part, initially be on high value/ low cost initiatives, factored where possible/ practicable into operating budgets. Prevailing weather conditions will influence what is achievable in any given year; a financial year with relative benign weather/ river flows will allow more to be achieved and vice versa. Some improvements, particularly to passage at pump stations, will have a cost that cannot be accommodated within existing operating budgets; specific approval will be sought for these initiatives. Staff will also continue to fully explore funding alternatives to targeted rates.

5. COMMUNITY ENGAGEMENT

5.1. This item is being presented in a public forum. As further information is gathered and improvement work identified this information will be presented at Scheme Liaison

Committee meetings and Catchment Community meetings. It will be a standing item for all such meetings.

6. SIGNIFICANT BUSINESS RISK IMPACT

6.1. Notwithstanding the events that unfolded in the Waikato in 2015 and the reputational damage that arose, the matters contained in this item are not considered to constitute significant business risk; put simply the situational characteristics do not exist on a similar scale in the Horizons' region.

7. BACKGROUND

7.1. New Zealand has a highly mobile native fish fauna consisting of a large number of diadromous (migratory) species. New Zealand's native fish communities also display a high degree of endemism (85% of New Zealand's native fish fauna are only found in New Zealand).

7.2. The Horizons' region is home to 17 species of native freshwater fish, with most found in the Horizons' region. They are migratory in nature and therefore require access to the sea at some stage in their life cycle. The region's rivers and streams are the conduit between the sea and freshwater bodies.

7.3. Given the migratory nature of our native fish species those streams that are closer to the coast will generally have a more diverse range of freshwater fish species due to the ability of fish to be able to penetrate inland (due to climbing abilities, habitat preferences etc.).

7.4. The inappropriate type/ placement of structures can therefore limit the ability of fish to be able to complete their life cycle. This explains why at times, fish monitoring at sites can show surprisingly low numbers and limited diversity where one would expect higher numbers and/ or a wider diversity.

7.5. The June 2018 item to Council's Catchment Operations Committee referenced a high fish mortality event that occurred in the Waikato in 2015. That incident and the technical work that has resulted from it, prompted staff to reflect on the potential impacts that Horizons' pump stations may be having on both native fish migration and mortality rates, systematically determining where best to focus efforts. That assessment of the pump stations found that :

- Of the 22 pump stations, 19 are rated as low to medium impact, with three identified as having a relative level of high impact. Those three sites were Diagonal, Koputaroa No.1 and Okuku.
- Of those sites identified as having a high impact, one has an associated drain network where the ecological values are rated as high with the other two high impact sites identified as having drains with slightly lower ecological values, requiring further work to determine the potential benefits of any improvement works.

7.6. When assessing the ecological value of the sites staff acknowledge that it was based on the current in-stream values of the contributing network and that this current ranking may not reflect either its potential or community aspirations. It also valued all species equally and it may be that eels (the main species of concern in regard to passage through pumps) require a higher ranking. Neither of these factors change the underlying approach to undertake further investigate works to identify potential solutions, costs and associated benefits; to make this an ongoing component of operational activity, notwithstanding the fundamental level of service drivers.

8. DISCUSSION

8.1. The Bloxam Burnett & Oliver report commissioned by the Waikato Regional Council looked into native fish migration through land drainage and flood control infrastructure. The report generally focused on the ability of eels to be able to pass through pumps, their large size when migrating downstream making them particularly vulnerable. The report looked closely at the Waikato incident and the impact the type of pump and the outlet configuration had on fish passage mortality, as well as potential remedial options to address the fish migration impacts of land drainage and flood control infrastructure.

8.2. Of the 22 pump stations Horizons operates, 17 use axial flow pumps as either duty or standby/ flood pumping. These types of pumps have been identified as having the highest mortality rates for eels. Pumping durations are a factor in mortality rates and they vary greatly, usually in the range 50 to 500 hours per year.

8.3. There are a number of remedial options available to enhance fish passage at pump stations, including:

- Deterrent measures to prevent fish from entering potential harmful environments (narrow weed screens, electric screens, light and sound barriers);
- Alternative pumping systems (fish friendly pumps, low impact pumps); and
- Alternate fish passage (fish friendly floodgates, alternate migrator routes).

8.4. The use of alternative pumping systems has largely been discarded as an option, at least in the short term, primarily due to cost. This option will however be considered when designing new or replacement pump stations, part of a wider efficiency/ rationalisation strategy that will form part of future scheme reviews.

8.5. A review of the current screen set up at the 22 pump stations shows that the gap between the vertical bars range from 20 to 90 mm. Reducing screen aperture without increasing screen area can have two detrimental effects to both pump life and levels of service. A reduction in screen aperture increases flow velocity resulting in more turbulent flow and that in turn can lead to cavitation. Higher velocities can also increase head loss, detrimentally affecting levels of service.

8.6. Staff have very roughly costed constructing wider screens either upstream of the pump station or running parallel to drain flow, presented in Annex B. Being able to justify the cost of this work purely on the basis of a potential reduction in fish mortality is difficult at best; the focus is more on increased awareness amongst staff around taking opportunities that arise from other drivers. An example would be replacing a screen coming to the end of it's useful life – factoring in to that replacement how potential fish mortality could be reduced at the same time.

8.7. More detailed assessments of both habitat and impediments to passage within networks is also a consideration, looking at habitat size and quality, upstream barriers, fish species (expected and present) and fish numbers already present within that part of the network. That work will enable more informed decisions and better justification for improvements.

8.8. That work has commenced with staff undertaking an extensive inspection of the Koputaroa No.4 station network to determine potential habitat size and upstream barriers, along with lengths of fencing and planting already in place alongside these potential habitat sites. Further investigation by Natural Resources and Partnerships staff will help determine the habitat quality and fish numbers that currently exist.

8.9. River Management staff also intend to monitor eel mortality rates at some key pump stations over the coming winter period to provide us with a more accurate picture of the impact that the pump stations are having on the eels.

9. COMMENT

9.1. Clearly the Diagonal, Kop #1 and Okuku stations are the main risks in regard to both passage and mortality. Staff will continue to build the picture around both risks and opportunities at those three sites and what is feasible by way of modifications, with a view to including a programme of works into the next Long-term Plan update. Wider and more day to day passage/ habitat improvements to the network will continue as part of operational activity, along with an appropriate level of focus on potential environmental enhancements as part of the scheme review process.

10. CONSULTATION

10.1. No specific consultation is planned for the matters contained in this item.

11. SIGNIFICANCE

11.1. This is not a significant decision according to the Council's Policy on Significance and Engagement.

John Foxall
AREA ENGINEER, SOUTHERN

Ramon Strong
GROUP MANAGER, RIVER MANAGEMENT

ANNEXES

A Summary of Current Screen Set Up

B Preliminary Cost Estimates

C Koputaroa No. 4 Pump Station Network Environmental Enhancement Potential Report

Location	Description	Pump Type	Screen Width	Gap Width between Bars	# of Bars	Width of Bars
Okuku		Mac Ewans Axial Flow	11835mm	50-55mm	184	12mm
Ashlea Road	Duty Pump Flood Pump	Flygt Submersible Gwynnes Axial Flow	1620mm 3360mm	38-40mm 30mm	33 82	10mm 10mm
Boundary	Duty Pump 1 Flood Pump Duty Pump 2	Flygt Submersible Mac Ewans Axial Flow Flygt Submersible	2940mm 4570mm 2960mm	40mm 35-40mm 40mm	60 93 59	10mm 10mm 10mm
Donnelly's		Mac Ewans Axial Flow	3300mm	30-40mm	73	10mm
Birnie Coombes		Mac Ewans Axial Flow Flygt Submersible	2010mm	35-40mm	40	10mm
Makerua East		Gwynnes Axial Flow	2135mm	25-30mm	62	5mm
Speirs		Gwynnes Axial Flow	3340mm	25mm	85	12mm
Kingston		Tsurumi Submersible	1940mm	40-45mm	36	10mm
Mangaore		Mac Ewans Axial Flow Flygt Submersible	2870mm	25mm	79	10mm
Bowlers	Upstream Grill Downstream Grill	Flygt Submersible	1810mm 1800mm	40-45mm 40-45mm	33 33	10mm 10mm
Kerekere Road	Bottom Grill	Mac Ewans Axial Flow	4665mm	35-40mm	96	10mm
Cooks		Mac Ewans Axial Flow	8390mm	40-60mm	140	10mm
Diagonal		Mac Ewans Axial Flow	8370mm	45-50mm	140	10mm
Pleuger	Duty Pump Flood Pump	Pleuger Pleuger	1790mm 3100mm	40-45mm 85-90mm	38 30	5mm 10mm
Whirokino		Tsurumi Submersible	2195mm	45-50mm	37	10mm
Kop 1		Mac Ewans Axial Flow	5770mm	40mm	126	7mm
Kop 2		Flygt Submersible	2150mm	40mm	42	10mm
Kop 3	Duty Pump Flood Pump	Flygt Submersible Flygt Submersible	1605mm 2130mm	40mm 35-40mm	32 43	10mm 10mm
Kop 4	Duty Pump Flood Pump	Flygt Submersible Flygt Submersible	1600mm 2140mm	40mm 25mm	32 63	10mm 5mm
Dixons		Flygt Submersible	1850mm	30-35mm	42	10mm
Raupo Road		Mac Ewans Axial Flow	2200mm	35-40mm	44	10mm

Annex B

Location	Pumping Capacity (m/s)	Description	Pump Type	Width - Con to Con	Gap Width between Bars	# of Bars	Width of Bars	Floor Level	Operating Range Start	Operating Range Stop	Revised Screen Width	Cost Estimate $ 15,000.00
Okuku	5.1		Mac Ewans Axial Flow	11.835	50-55mm	184	12mm	-0.87	2.3	2	17.00	$ 255,000.00
Ashlea Road	0.225 0.56	Duty Pump Flood Pump	Flygt Submersible Gwynnes Axial Flow	1.62 3.36	38-40mm 30mm	33 82	10mm 10mm	2.5 3.15	3.6 4.28	3.3 3.86	10.20	$ 153,000.00
Boundary	0.45 2.26 0.45	Duty Pump 1 Flood Pump Duty Pump 2	Flygt Submersible Mac Ewans Axial Flow Flygt Submersible	2.94 4.57 2.96	40mm 35-40mm 40mm	60 93 59	10mm 10mm 10mm	2.11 2.42 2.11	3 3.54 3	2.7 3.33 2.7	34.00	$ 510,000.00
Donnelly's	1.12		Mac Ewans Axial Flow	3.3	30-40mm	73	10mm	0.16	2.9	2.2	6.80	$ 102,000.00
Birnie Coombes	0.605		Mac Ewans Axial Flow Flygt Submersible	2.01	35-40mm	40	10mm	1.91	2.55	2.25	17.00	$ 255,000.00
Makerua East	0.76		Gwynnes Axial Flow	2.135	25-30mm	62	5mm	1.88	2.74	2.54	13.60	$ 204,000.00
Speirs	0.19		Gwynnes Axial Flow	3.34	25mm	85	12mm	2.31	3.15	2.95	3.40	$ 51,000.00
Kingston	0.45		Tsurumi Submersible	1.94	40-45mm	36	10mm	1.55	2.81	2.35	6.80	$ 102,000.00
Mangaore	0.225		Mac Ewans Axial Flow Flygt Submersible	2.87	25mm	79	10mm	1.43	2.55	2.24	3.40	$ 51,000.00
												$ 1,683,000.00
Bowlers	0.45	Upstream Grill Downstream Grill	Flygt Submersible	1.81 1.8	40-45mm 40-45mm	33 33	10mm 10mm	-2.4	0.17	-0.14	3.40	$ 51,000.00
Kerekere Road	0.725	Bottom Grill	Mac Ewans Axial Flow	4.665	35-40mm	96	10mm	2.45	4.075	3.7	6.80	$ 102,000.00
Cooks	4.08		Mac Ewans Axial Flow	8.39	40-60mm	140	10mm	-2.65	0	-0.6	20.40	$ 306,000.00
Diagonal	2.72		Mac Ewans Axial Flow	8.37	45-50mm	140	10mm	-3.75	-0.8	-1.4	13.60	$ 204,000.00
Pleuger	4.64 1.5	Duty Pump Flood Pump	Pleuger Pleuger	1.79 3.1	40-45mm 85-90mm	38 30	5mm 10mm	-1.77 -2.03	0.17	-0.14	34.00	$ 510,000.00
Whirokino	0.332		Tsurumi Submersible	2.195	45-50mm	37	10mm	0	0.4	0.27	13.60	$ 204,000.00
												$ 1,377,000.00
Kop 1	2.26		Mac Ewans Axial Flow	5.77	40mm	126	7mm	-0.11	1.9	1.2	17	$ 255,000.00
Kop 2	0.45		Mac Ewans Axial Flow	2.15	40mm	42	10mm	0.145	1.91	1.51	3.4	$ 51,000.00
Kop 3	0.76 0.225		Mac Ewans Axial Flow Flygt Submersible	1.605 2.13	40mm 35-40mm	32 43	10mm 10mm	-0.6 2.766	1.08	0.83	10.2	$ 153,000.00
Kop 4	0.76 0.225		Mac Ewans Axial Flow Flygt Submersible	1.6 2.14	40mm 25mm	32 63	10mm 5mm	-1.1 -2.05	0.67	0.42	6.8	$ 102,000.00
												$ 561,000.00
Dixons	0.42		Flygt Submersible	1.85	30-35mm	42	10mm	5.62	7.02	6.72	6.8	$ 102,000.00
Raupo Road	0.95		Mac Ewans Axial Flow	2.2	35-40mm	44	10mm	7.38	8.88	8.48	10.2	$ 153,000.00
												$ 255,000.00

Koputaroa No. 4 Pump Station Network Environmental Enhancement Potential

Annex C

May 2019

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Author
John Foxall
Area Engineer Southern

Acknowledgements to
Emily Carroll
Ronny Keelan

Front Cover Photos
Native Planting alongside Drain A3
Photo: (Emily Carroll)

May 2019
Report No: 2019/EXT/1636

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1. Background

The Koputaroa Drainage Scheme originated in 1913 to provide drainage to the Buckley area west of Shannon. Over time the scheme has expanded and been developed into the network of infrastructural assets that we currently maintain today. The scheme currently provides drainage and flood protection benefit to approximately 2,500 ha of low-lying rural land between Shannon and Levin.

The scheme has a catchment of around 8,500 ha extending from the lower reach of the Tararua Ranges to the Manawatu River with the low-lying areas of the scheme being protected by stopbanking on the Manawatu River, Koputaroa Stream and Aratangata Drain.

In total, the scheme maintains approximately 50 km of drains and stream channels, four pump stations, 19 km of stopbanks and 37 floodgates. Six of the floodgates are on outlets into the Manawatu River and are jointly maintained with the Lower Manawatū Scheme. The two largest of these river floodgates are on the Koputaroa Stream and Aratangata Drain.

Koputaroa No. 4 Pump Station network is the most western outlet for the Koputaroa Drainage Scheme and has a catchment of approximately 655 ha.

1.1 Koputaroa No. 4 Pump Station

The current Koputaroa No.4 Pump Station was constructed in 1963 as part of a comprehensive drainage upgrade following the completion of the Manawatu River stopbanks. The station was expanded in 2003 to include a submersible pump to provide low level drainage pumping.

The Koputaroa No.4 Pump Station services an area of 655 ha and comprises a MacEwans axial flow pump (flood pump) and a submersible pump (duty drainage pump). The combination of the two has a maximum pumping capacity of 985 l/s via a surge chamber and discharge line through the stopbank.

Pump	Type	Pumping Capacity	Pumping Coefficient (mm/ha/day)	Catchment Area (ha)
Koputaroa No.4	MacEwans PPF 24/30	760 l/s	12.9	655
	Flygt	225 l/s		

The pump operates when the water levels in drain A1 are high due to either the gravity outlet being shut or the flow is too great for the outlet.

On average, the Koputaroa No.4 MacEwans pump operates for about 100 hours per year and the submersible about 2,370 hours per year.

1.2 Soil Types And Land Use Within The Catchment Area

Most of the low-lying land is peat silt loam with sand hills surrounding the low-lying land. Significant settlement occurred in this area following the installation of the original pumps in this area.

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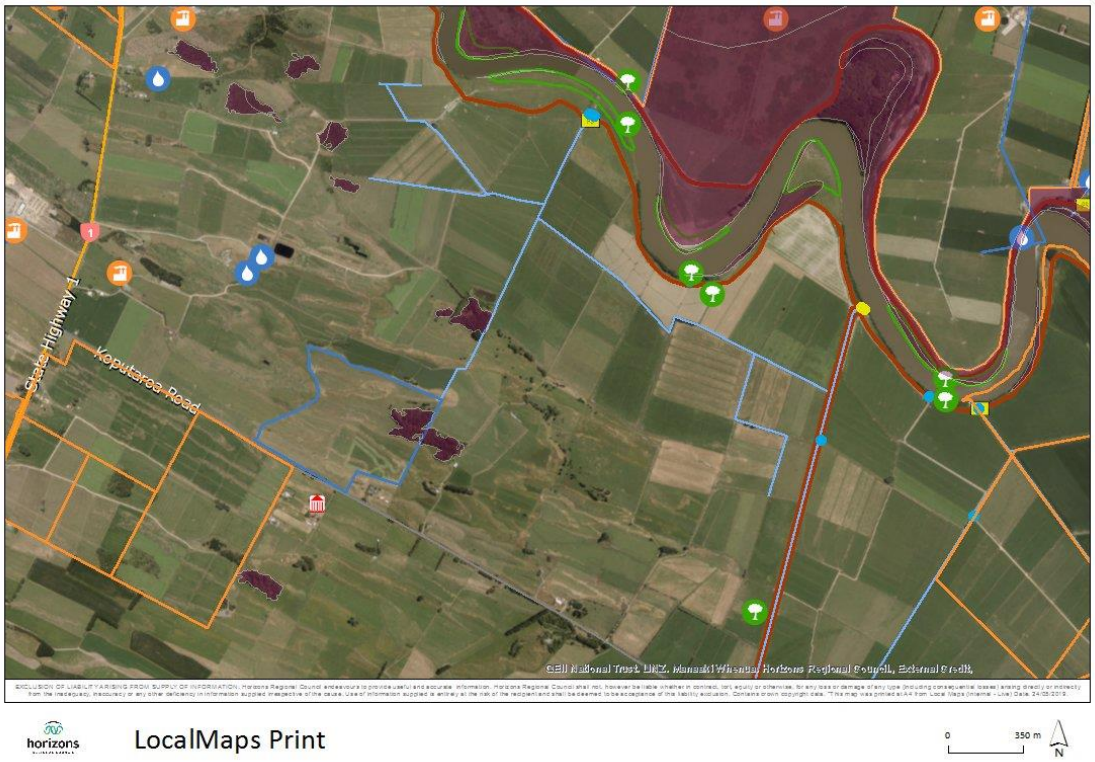


The land is predominantly farmed for dairy and dairy runoff, with periodic cropping of several of the paddocks close to the Aratangata Drain.

There are pockets of remnant native bush spread across the catchment most of which have been fenced off to exclude stock.

2. Current Network Profile

2.1 Drainage Network

The drainage network for this area has a single exit into the Manawatu River at the Koputaroa No.4 Pump Station. This reach of the Manawatu is tidal limiting gravity drainage under normal river flow conditions. The installation of a fish friendly floodgate at this site has allowed some back flow into the network with a corresponding minor increase in operating costs.

When heavy rainfall coincides with high river levels, the network is reliant on the pumps to maintain the drainage levels. In sizeable events, one of the spillways on the Aratangata Drain, situated approximately 400 m upstream of the Aratangata floodgates, will spill water into the top end of the Koputaroa No.4 network increasing flow velocity in some of the drains on the eastern side of the network.

Asset Type	Total Length Fenced (km)	Total Length Not Fenced (m)
Scheme drains	6.8 km	776 m
Non-scheme drains	11.3 km	369 m

2.2 Native Plantings

Over the last few years, there has been an increasing desire to plant along the bank of scheme drains to provide shade and filtration of runoff into the drain. Current practice is to allow the planting up one side of the drain in accordance with accepted planting guideline and to leave the adjacent side open for ongoing maintenance purposes.

At present approximately 740 m of scheme drains have been planted with natives, an initiative of the landowner.

2.3 Culverts

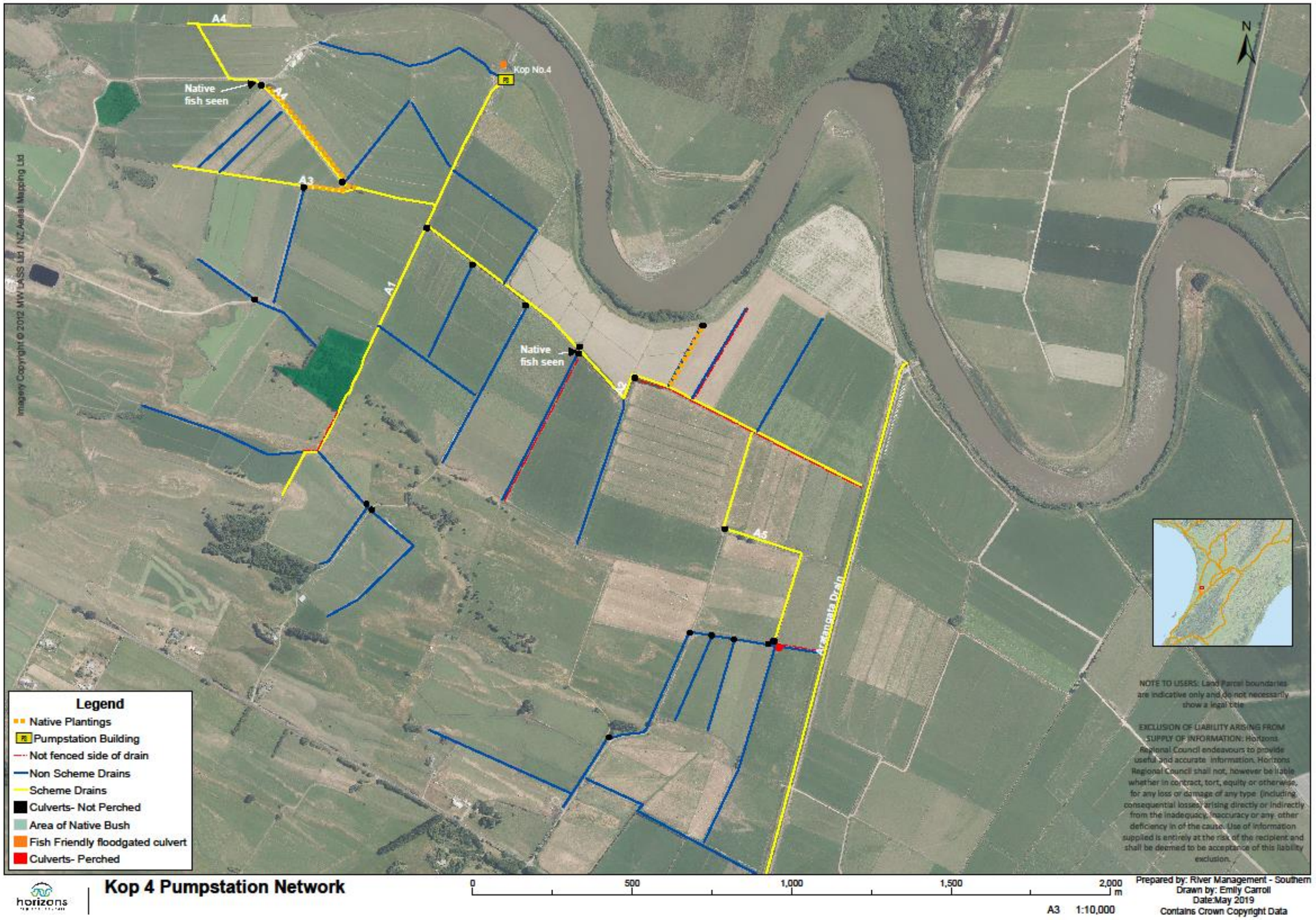
A total of 17 culverts form part of the wider Koputaroa No.4 network. From our preliminary observations, there is currently one that is affecting fish passage.

Further investigation is required to determine if factors other than invert level are impacting on the ability of the other culverts to allow the passage of native fish species. Those other factors include:

- Water velocities and depths downstream of, throughout and upstream of the structure;
- Excessive turbulence;
- Adequate natural light;
- Debris accumulation; and
- Abrupt changes on flow regime during periods of high flow.

Access to the main river for fish passage is also important and while the outlet on the gravity gate at the Koputaroa No. 4 Pump Station is a fish-friendly gate, further investigation is required to identify the operational frequency that this gate allows for fish passage and options to improve fish passage at specific times of the year during migration periods.

2.4 Map of Current Drainage Network Key Features



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2.5 Table of Photos Plus Description of Key Features

Feature Type	Photo	Description/ Profile
Paddock runoff - drainage channel		Side drain running along farm track ▪ fenced both sides- 1. 2-wire ▪ grassed up drain banks ▪ low batter slopes
Paddock runoff - drainage channel		Side drain running along farm track ▪ fenced both sides- 2. 2 –wire ▪ grassed up drain banks with a few native cabbage trees and toi toi ▪ low batter slopes
Culvert		▪ 500 mm plastic culvert ▪ 30% water level
Culvert		▪ 300 mm concrete culvert end pipe dipping- could be perched in low water levels due to dropping of end pipe.

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Paddock runoff - drainage channel- runs into scheme drain		First 300 m section fenced both sides. Last 200 m section only fenced one side- can see where stock have trampled in and out.
Scheme drain A5-(0-300 m section)		Fenced both sides. Good grass cover on banks with small over hang.
Scheme drain A5-(300-600 m section)		Fenced both sides. Good grass cover on banks with small over hang and a few larger trees.
Culvert crossing on A5 drain		▪ 900 mm culvert ▪ 50% full of water

Scheme drain A5-(600 m- outlet into A2 drain)		Good grass cover on banks with small over hang. Fenced both sides however fence on left hand side is set back 4 m to include access track along drain edge.
A2 drain (0-350 m)		Low batter slopes. Plantings and fenced on one side. No fence on left hand side.
A2 drain 350-450 m		Low batter slopes. Plantings and fenced on one side. No fence on left hand side.
Culvert A2 drain		▪ 1050 mm culvert ▪ 30% in water level

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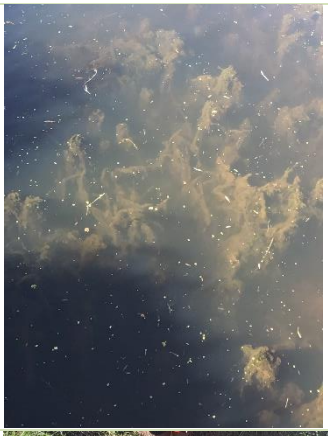
A2 drain 450-500 m		Inanga seen in this section of drain hanging around the below culvert. This section is fenced on both sides.
Culvert along A2		▪ 1050 mm culvert ▪ 20% in water level
A2 drain (500-1.2 km)		Fenced both sides. Good grass cover on slopes.
Koputaroa No. 4 Pump Station		
Scheme Drain A1		Fenced both sides. Grassed banks.

Culvert A2 drain through to A1 drain		▪ 900 mm concrete culvert ▪ 30% of culvert in water level
Native bush area adjacent to A1 drain		Large area of native bush land with drains feeding into it and then run along into A1 drain (seen on above map). A1 drain is fenced on land side.
A1 drain past bush area		Is only fenced on one side. Can see where the stock have been along. Steeper profile banks from bush land up.
A1 drain into A3 drain		Fenced both sides and has no culvert. Is an open outlet.

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A3 drain		300 m upstream from outlet into A1 a 150 m section has been planted up with native plants. The drain has been fenced off both sides.
A4 drain		A 400 m section of the right bank has also been planted up with natives plants and the drain fenced off.
Culvert across access track on A4		A 900 mm concrete culvert. Fish were seen in this section of drain by the culvert.

3. What Has Been Done To Date

The landowners in this network have been fairly proactive and actively working towards improving the habitats around the drainage networks. To date, the following actions have been undertaken:

- Fencing
  - 90% of the scheme drains have adequate fencing on both sides to keep stock out. There is still approximately 800 m left still to be fenced.

- Planting
  - Length of scheme drains planted in natives is 740 m. These plantings were an initiative of the landowner.
    3.
- Fish friendly floodgate at Koputaroa No. 4 Pump Station gravity outlet
  - A fish 1200 mm plastic friendly floodgate has been installed. This is to allow for the upstream movement of migratory fish being able to move around, through or over a barrier.

Annex C

4. Issues found

From our preliminary inspection of the network, there are very few actions that are required to protect the existing habitat. Some of the actions identified include:

- Some sections of drains are yet to be fenced which has led to stock damage of the drain. Fencing of the remaining sections of drain will exclude all stock from the waterways.

- There was one perched culvert identified, replacing this with a correctly design fish friendly culvert will extend the habitat available to native fish.

Annex C

5. Options To Improve Our Understanding Of Network Habitat

The work we have done to date has included a visual inspection of the infrastructure/ improvements that currently exist within this network. We have also identified additional works that will help improve aquatic ecosystem values without detrimentally affecting the levels of service.

Going forward we need to better understand the actual habitat and what currently exists and what are achievable. To achieve this next step we would like to recommend that further in-depth catchment study needs to be carried out focusing on the below areas:

- Identify fish species and fish numbers already present within the catchment, which will help us in knowing what habitats we need to provide for the specific fish found;
- Identify the current water quality in the various parts of the network;
- Undertake some flow monitoring to understand the catchment hydrology; and
- Review the current culvert sizing and design to maximise fish passage.

Using this information we can then look to prioritise habitat improvement works based on the potential benefit we would gain from the work against estimated cost to undertake the work.

Annex C

Report No.	19-88
Information Only - No Decision Required	

RURAL UPGRADE PROJECT UPDATE (OMS 15 36)

1. PURPOSE

1.1. The purpose of this item is to update members on progress with implementing the **Lower Manawatū Scheme (LMS) Rural Flood Protection Upgrade Project (RUP).**

2. RECOMMENDATION

That the Committee recommends that Council:

a. receives the information contained in Report No. 19-88; and

b. notes progress with implementing the Lower Manawatu Scheme Rural Flood Protection Upgrade Project.

3. FINANCIAL IMPACT

3.1. The table below provides a summary of the key financial information for the RUP:

Cost to complete 2018-19 Budget	**$10.27M**
Value of work completed over the 2019 construction season	**$5.74M**
Revised estimated cost to complete	**$5.15M**
Current 2019-2020 budget	**$5.60M**
Estimated additional funding required	**Nil**

4. COMMUNITY ENGAGEMENT

4.1. Community engagement has been a significant element of the RUP delivery this construction season. Community engagement continues to be achieved through LMS Liaison Committee and Catchment Community meetings, however this season has seen a drive towards more focused communication with landowners and directly impacted community groups. Staff have utilized property consultants for liaison and guidance (particularly with statutory processes) with impacted landowners, as well as holding several productive Hui with local Iwi. A forward thinking approach has taken place with archaeological and cultural impact this season that has built working relationships that should grow with future endeavours between Council and the various public and private entities.

5. SIGNIFICANT BUSINESS RISK IMPACT

5.1. Implementing the RUP significantly reduces business risk associated with the provision of LMS flood protection. Although much of the focus with the RUP has been on gross standards of flood protection, the work also strengthens a significant proportion of the network ultimately providing a higher level of operating reliability. This in turn, translates to a tangible and substantial (but not quantified) reduction in expected damage costs across a significant portion of the lower Manawatū River floodplain.

6. BACKGROUND

6.1. The RUP forms part of Council's response to the February 2004 floods, with the intent of providing a higher and more uniform standard of flood protection to those on the Manawatū floodplain outside of Palmerston North. Consultation took place in 2008 with the project formally adopted through the 2009-19 Long-term Plan.

6.2. Since the RUP commencement in 2006-07, all scheduled works were prioritized with the prioritization taking into account both freeboard deficiency and the consequences (at a macro level) of failure. Project scope has largely been determined using a freeboard deficit criteria – where a section of stopbank has a freeboard deficit exceeding 100 mm.

6.3. Delivering a project of this size and timeline has provided a wide range of challenges. The scope of the project has evolved as it has progressed, requiring a range of value judgements to be made along the way. The project has also had to manage a range of weather-related risks, primarily a large flood event occurring at an inopportune time.

6.4. As we approach the end of this program of works resource planning, stakeholder engagement and risk management are paramount to ensuring a successful delivery of the final work packages in the 2019-20 construction season.

2019 CONSTRUCTION SEASON

6.5. The budget at the start of the 2018-19 financial year was comprised as follows:

2017-18 Carry-forward	**$2.94M**
2018-19 Budget	**$5.52M**
Additional Approved Budget	**$1.80M**
Total 18-19 Budget	**$10.26M**
Estimated Actual Spend	**$5.74M**

6.6. Learnings from previous years have influenced the risk mitigation strategy employed with the 2019 season, one component being tendering large work packages earlier (June-July rather than October-December). This targeted the time of year when committed forward workload for contractors is generally at its lowest, maximizing both level of interest and competitive pricing. It also reduced the risk of a shortened 'good weather' window as work could (did) start earlier in the season. In the end, a relatively dry construction season prevailed.

6.7. Obtaining land entry agreements continued to challenge the Project team this season and resulted in a significant tax on resource (both internal and external). Due to receiving objections to the public works adjacent to the Ōroua River near Awahuri, a portion of stopbank construction was put on hold until next season. The relevant provisions of the **Soil and Conservation of Rivers Control Act (SCRCA**) have been utilised to reduce this risk, enabling discussions to follow a set protocol.

6.8. Another delivery challenge included working in areas of cultural and historical significance. Cultural monitoring and archaeological consultation have played an important role in project delivery, with the requirements relating to archaeological authorities changing as the year progressed. One catalyst for that change was the discovery of an artefact with the Himatangi Block Road work; work was stopped on the last section (approximately 250 m length) of that work package, to be completed next season once the authority is in place.

REMAINING WORK PROGRAM

6.9. The budget summary is as follows:

2018-19 Carry-forward	**$4.52M**
2019-20 Budget (as per Annual Plan)	**$1.0 8M**
Total 2019-20 Budget	**$5.60M**
Revised estimated cost to complete	**$5.15M**

6.10. Note that the process of obtaining archaeological authorities was not part of the original budget. Having authorities in place will reduce a range of risks of discovery, delay and being on the receiving end of the not insignificant penalties contained in the Heritage New Zealand Pouhere Taonga Act 2014. The knowledge capture associated with obtaining the authority will help maintain relationships with local Iwi through knowledge sharing (in addition to the Cultural Impact Assessments already carried out and the onsite monitoring that Iwi representatives have undertaken with some of the key construction projects).

6.11. Construction cost estimates have been updated for the remaining work on the Ōroua River around Awahuri. As previously noted, certainty around cost will occur once contracts are in place and absolute certainty once work is completed. The remaining RUP works program, apart from the Ōroua River Awahuri section, is largely made-up of various smaller packages. It is likely that some rationalisation of the forward work programme will take place as the year progresses e.g. transferring the extension of the Makino right stopbank upstream of the control gates to the Reid Line Floodway upgrade project.

PRIMARY DELIVERY RISKS AND MITIGATION STRATEGIES

6.12. Although close to completion, there remain a number of issues that could affect the delivery of the project. One issue that has been highlighted in previous years is adverse weather; this will continue to be a risk in the final delivery year of the RUP. The final section of the Ōroua River to be stopbanked will require a large volume of material and maximization of the construction weather window.

6.13. Due to the complex nature of the finishing pieces of this delivery, the project risks a lack of contractor availability and experience. In 2018 staff worked hard to ensure work was tendered early, enabling certainty for contractors and their program planning; a similar intent is planned for this year. Where smaller projects can be packaged together, staff will do so, in order to appeal to the market but also allow efficient use of resources.

6.14. Fill availability and sourcing will continue to be a significant challenge for the 2019-20 season. On the Ōroua River investigations have been undertaken to confirm borrow material with physical characteristics suited to stopbank construction. Some areas are located on land owned by another local authority and will require agreement of use and assurance of archaeological authority. If significant amounts of fill are required to be imported, additional haulage costs may increase costs significantly, one of the large costs risks for the upcoming season.

6.15. Archaeological authority is being sought for two projects; the Ōroua Left Bank and Himatangi Block Road Sector 3, the latter after a discovery of significance. Although staff have engaged consultants early in the calendar year in order to have authority before the 2019-20 construction season, consultation plays a role in the submission process and it can take months to get ‘the right people in the room’. Due to the hard work of staff over the past 12 to 18 months in establishing relationships with local Iwi, the hope is that this aids in the consultation process and timeline. However, this remains a significant risk for the Ōroua River final section, as it is the larger of the two projects in this process and therefore requires authority to be in place early in the season.

6.16. Objection(s) received to the issue of SCRCA notices for the construction of the remaining sections of new stopbank alongside the Ōroua River are (at the time of this report) yet to be heard in front of an independent assessor. After trying to work through the reasons for the objection(s), objection(s) are scheduled to be heard in July 2019. River Management staff are confident with the design and consultation that has taken place, however this risk will remain until after the hearing decision. Staff have sought legal and property specialist advice throughout the process, consistent with the wider risk management strategy around the use of statutory tools.

7. SIGNIFICANCE

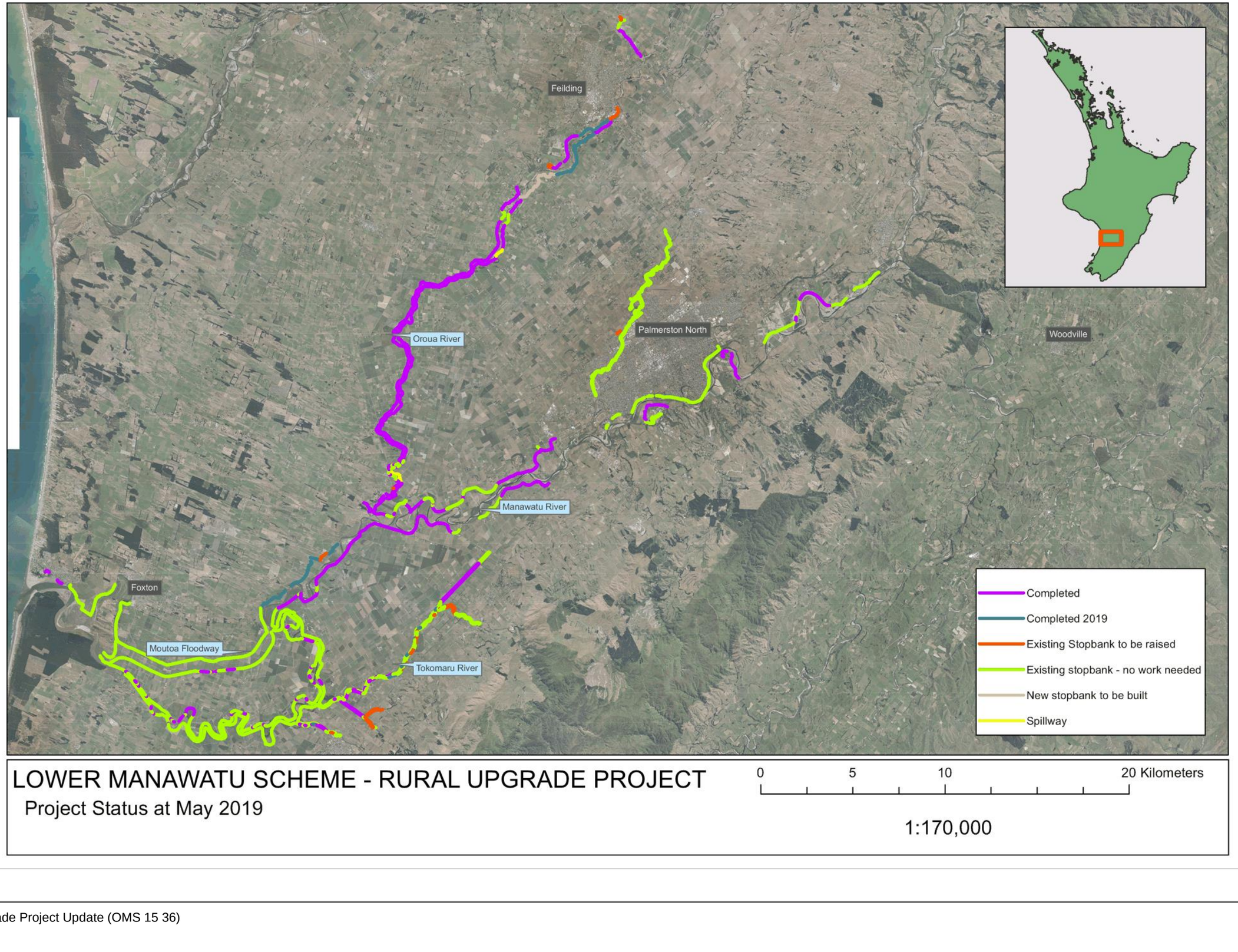
7.1. This is not a significant decision according to the Council's Policy on Significance and Engagement.

Claire Kitson
PROJECT ENGINEER

Ramon Strong
GROUP MANAGER RIVER MANAGEMENT

ANNEXES

A LMS RUP Project Status



LOWER MANAWATU SCHEME - RURAL UPGRADE PROJECT

Project Status at May 2019

0 5 10 20 Kilometers

1:170,000

Report No.	19-89
Information Only - No Decision Required	

MANAWATU & OROUA GRAVEL RESOURCE STUDIES (PRD 04 09 & PRD 05 14)

1. PURPOSE

1.1. The purpose of this report is to inform the Committee about the findings of an updated assessment of the gravel resource in the lower reach (downstream of the Gorge) of the Manawatū River.

2. EXECUTIVE SUMMARY

2.1. The study concludes that the gravel resource in the lower Manawatū River has aggraded by approximately 890,000 cubic metres since it was last surveyed in 2011, which equates to around 148,000 cubic metres per annum. These findings demonstrate the positive effects that the management of gravel extraction under a global consent is having.

2.2. While the study has concluded that the river bed has aggraded over much of the reach, it also notes that in the upper part of the reach between Ashhurst Bridge and Karere Road the river was in heavily degraded state in 2011. The resource is currently in a recovery phase and has not yet returned to pre-2011 levels and as such, a continuation of the current management regime is a prudent response.

2.3. The study has also found that in the reach of the river between Hamilton's Line and the Oroua confluence there is the potential to increase the volumes of gravel that are extracted under the global consent.

2.4. As well as examining the gravel resource of the lower Manawatū, this study also looked at the silt phase of the river between Opiki and the Tasman Sea. It was found that sedimentation has been occurring, at a rate of approximately 22,500 cubic metres per annum, between Opiki and the Moutoa Floodgates. The comparison of cross section profiles shows that this deposition has occurred on the berms, whilst the river channel has both narrowed and deepened.

2.5. An analysis of cross sectional changes downstream of the Moutoa Floodgates has revealed that there has been an overall loss of material from the river corridor in this reach. Observations of the cross sectional survey have shown that, like the upstream reach, the river channel has narrowed and deepened over time, offsetting berm deposition rates.

2.6. This narrowing and deepening of the river channel, along with the sedimentation of the berms, may well pose management challenges into the future. Conclusions drawn from this work forms part of the wider sedimentation initiative currently underway.

3. RECOMMENDATION

That the Committee recommends that Council:

a. receives the information contained in Report No. 19-89.

4. FINANCIAL IMPACT

4.1. There are no financial impacts associated with this report or its recommendations.

5. COMMUNITY ENGAGEMENT

5.1. The findings of this report will be communicated to gravel extractors and other key stakeholders.

6. SIGNIFICANT BUSINESS RISK IMPACT

6.1. There are no significant business risks associated with this item.

7. BACKGROUND

7.1. As part of the fluvial programme the gravel resource of the lower reach of the Manawatū River was last surveyed and studied in 2011. This study builds upon those findings with information gathered by cross sectional survey carried out in the summer of 2017-18.

7.2. Those cross section lines have been surveyed at various times by Horizons Regional Council and its predecessors. These surveys have been undertaken for a variety of reasons including the design of flood protection and other infrastructure, as well as to inform the management of the river and its gravel resource.

7.3. Historically, the gravel reach of the river has seen a higher frequency of surveys as the extraction of gravel has necessitated the need to understand how this activity has altered the physical characteristics of the river. Over recent years the surveying of this reach has formed part of the fluvial programme and has been funded through the levies associated with gravel extraction consents.

7.4. Note that while the gravel reach of the river has been surveyed as part of the fluvial programme, the silt phase has not been surveyed with the same frequency.

7.5. Horizons' Infrastructure Strategy as outlined in the current **Long-term Plan (LTP)** identifies "sedimentation effects on levels of service" as a significant issue – the potential impact on flood protection levels of service. Given the importance of the issue and the currency of the data the 2017-18 survey included the reach through the silt phase to the mouth of the river, with that work funded by the **Lower Manawatū Scheme (LMS)**.

8. REPORT PRECIS

8.1. The study examined the gravel resource and the silt phase of the lower reach of the Manawatū River based on an analysis of river cross section information and gravel extraction records. It covers the 100 kilometre reach of the river between the Ashhurst Bridge and the mouth of the river at Foxton.

8.2. Data comparison found that between 2011 and 2018 overall the gravel resource of the river has aggraded by approximately 890,000 cubic metres. This equates to approximately 148,000 cubic metres per annum.

8.3. The study looked at how recent trends compare with those observed in 2011 and found that while the reach of the river between the Ashhurst Bridge and Karere Road has aggraded over the study period it was doing so from a low base i.e. heavily degraded state. This would suggest that the current management regime is having the desired effect, allowing the gravel resource to recover. As such, the recommendation is to continue the current management regime in this reach of the river.

8.4. Currently all of the gravel extraction from the lower reach of the Manawatū River is managed under a global consent held by Horizons Regional Council's River Management group. The volumes available for extraction under this consent align with the average annual allocable volumes outlined in the One Plan.

8.5. The study has found that the volumes of gravel available for extraction under the global consent appear to be adequate, achieving the balance between allowing the resource to replenish while retaining an ability to extract for management purposes should circumstance dictate that to be necessary.

8.6. The study also concludes that there is potential to increase extraction volumes below Hamilton's Line. Clearly, the context for such extraction would be to achieve a river management benefit e.g. localised extraction to reduce the size of a gravel beach and in turn reduce river erosion of the adjacent bank.

8.7. The study recommends that gravel extraction continues to be managed under the global consent held by Horizons Regional Council's River Management group to maximise the benefits of extraction. It has found that the consent allows adequate volumes of gravel to be extracted for River Management purposes. Since the volumes of gravel able to be extracted under the global consent align with the long-term allocable volumes of the One Plan, there is no evidence to suggest that these allocable volumes are not appropriate.

8.8. The study recommends that this section of the Manawatū River is resurveyed again in 2022-23 as is currently identified in the fluvial programme.

8.9. The study looked at cross sectional changes in the silt phase of the river and found that generally the channel appears to be narrowing and deepening. This is something that the LMS needs to be mindful of as these morphological changes may have management impacts.

8.10. Before the 2017-18 survey, the last surveys of the silt phase of the river were carried out in the 1990s. To be able to understand how the river is changing over time, it is recommended that the silt phase of the river be surveyed at the same regularity as the gravel reach, a task that will be captured by the LMS Operations and Maintenance Manual currently in production.

8.11. Additionally, it is noted that with the costs associated with **Light Detection and Ranging (LiDAR)** surveys decreasing with time, this technology could be used more in the future to provide a more detailed analysis of changes in the morphology of the river.

8.12. The full report is available on request.

9. SIGNIFICANCE

9.1. This is not a significant decision according to the Council's Policy on Significance and Engagement.

Ella Whale
GRADUATE RIVER MANAGEMENT ANALYST

Jon Bell
MANAGER INVESTIGATONS & DESIGN

ANNEXES

There are no attachments for this report.

Report No.	19-90
Information Only - No Decision Required	

PRESENTATION: MANAWATU GORGE LANDSLIDE DAM ASSESSMENT

1. PRESENTATION

1.1. In 2017 Horizons submitted an application to the Ministry for Civil Defence and Emergency Management's Resilience Fund seeking funding to engage GNS Science to assess the potential for landslide dams in the Manawatu Gorge. Staff were advised in late 2017 that the application was successful.

1.2. GNS Science expertise had been in high demand following the 2016 Kaikoura earthquake delaying the start of the work. These delays have proved to be beneficial, with many of the slopes that failed during the 2016 Kaikoura earthquake having characteristics similar to those in the Manawatu Gorge, enabling GNS Science staff to reference a significant and recent compendium of their own work.

1.3. GNS Science staff have completed the assessment with reporting in its final stages. The GNS Science staff involved will make a presentation to Committee members on the methodologies/ techniques employed with the assessment and the conclusions drawn from the assessment.

2. RECOMMENDATION

That the Committee recommends that Council:

a. receives the information contained in the presentation from GNS Science.

3. SIGNIFICANCE

3.1. This is not a significant decision according to the Council's Policy on Significance and Engagement.

Ramon Strong
GROUP MANAGER RIVER MANAGEMENT

ANNEXES

There are no attachments for this report.

Report No.	19-91
Information Only - No Decision Required	

REGIONAL COAST & LAND

1. PURPOSE

1.1. This report is to update Members on progress with Council's Regional Land and Coastal and Whanganui Catchment Strategy activities from 1 March to 30 April 2019.

2. EXECUTIVE SUMMARY

2.1. The report updates both the Regional Land and Coastal, and **Whanganui Catchment Strategy** (WCS) work streams as outlined in the Annual Plan and Operational Plan for 2018-19.

2.2. The Regional Land and Coastal, and WCS programmes are on track to achieve all five Annual Plan targets, as shown in Table 1.

2.3. In addition to the Annual Plan targets there are a number of Operational Plan targets, as shown in Table 2. These targets are more flexible and can change in response to changing work priorities. The majority of these are on track to be achieved. Some have not progressed at this stage due to other priorities, such as the application and contract negotiations for the **Hill Country Erosion Fund** (HCEF).

2.4. The WCS programme is supported through funding from the **Whanganui River Enhancement Trust** (WRET). The WCS target of 75 ha of work has already been exceeded with 147 ha of work complete. More work is being enabled through Council's endorsement of use of SLUI funds to do more work on WCS farms. Discussions have taken place with WRET about this new approach.

3. RECOMMENDATION

That the Committee recommends that Council:

a. receives the information contained in Report No. 19-91.

4. FINANCIAL IMPACT

4.1. There is no financial impact associated with recommendations in this report.

5. COMMUNITY ENGAGEMENT

5.1. This is a public item and therefore Council may deem this report sufficient to inform the public.

6. SIGNIFICANT BUSINESS RISK IMPACT

6.1. There are no significant risks inherent in the adoption of recommendations contained in this report.

7. OUTPUTS FOR ANNUAL PLAN 2018-19

7.1. All of the Annual Plan targets are expected to be achieved (Table 1).

Table 1: Annual Plan targets and progress Year to Date (YTD)

MEASURE	PROCESS FOR THE REPORTING PERIOD				YTD	TARGET	% YTD	Predicted Result
	1st	2nd	3rd	4th				
Regional Land and Coastal, Industry and Nursery								
Environmental Grant programmes to deliver erosion reduction works (hectares)	0	7	3	30	40	100	40	Expect to achieve target
Support for at least five industry partnership initiatives	2	2	0	4	6	5	120	Achieved target
Operate council nursery and source additional poles to deliver for erosion control	-	36,000 estimate	39,306		39,306	30,000	131	Exceeded target
Whanganui Catchment Strategy								
Environmental Grant programmes to deliver erosion reduction works (hectares)	1	0	143	3	147	75	196	Exceeded target
Deliver programme with WRET	-	On track	meeting		-	1	-	On target

7.2. The next meeting with WRET is programmed for May.

7.3. Annual Plan industry support includes: Beef and Lamb, Poplar and Willow Research Trust, Ballance Farm Environment Awards, Middle District Farm Forestry Association, Fertiliser and Lime Research Workshop and LandWise conference.

8. OPERATIONAL PLAN OUTPUTS 2017-18

8.1. In addition to the Annual Plan targets, a number of supporting work streams have been agreed to in the Operational Plans. These targets are more flexible and can change depending on workload, priorities and demand from the public at this point in the year.

Table 2: Operational Plan outputs and progress YTD

TARGET	QUANTITY	PROGRESS	RESULT
Regional Land and Coastal			
Produce Environmental Property Plans	As required	1 mapped	On track
Manage Environmental Grant projects to commit funding ($)	80,000	Over-allocated	On track
Industry Partnerships			
Commit funding to the Poplar and Willow Research Trust (P&WRT)	1	Paid	Achieved
Commit funding to support the Ballance Farm Environment Awards (BFEA) in our Region	1	Contract signed and paid	Achieved
Whanganui Catchment			
Manage Environmental Grant projects to commit funding($)	103,000	Over-allocated	On track
Deliver demonstration farm including field day	1	Autumn 2019	On hold this year
Soil Health			
Run Soil Health Workshops	As required	3	Achieved
Continue to implement State of Environment (SoE) monitoring programme for soil health and report results of previous year's programme	1	Spring sampling complete. Report still to do.	On track
Set up new SoE monitoring sites	10	10 new sites this spring	Achieved
Nurseries			
Provide technical support to the Poplar and Willow Research Trust (P&WRT)	1	Ongoing	On track
Provide sites suitable for trialling and bulking new varieties as supplied by P&WRT	2	4 planted	Achieved
Finalise and implement pole strategy		Draft completed	On track
Complete capital upgrade project at Woodville nursery		Building complete	On track
Develop a nursery strategy		Meeting held	On track by end of June, in conjunction with neighbouring Councils.
Regulatory Support			
Manage consent process for vegetation clearance, earthworks and cultivation to meet regulatory requirements		nil	
Support Consents and Compliance in implementing the National Environment Standard for Plantation Forestry (NESPF)		Discussion with Consent team	

- Land use consents centralised and reported through the Consents database.
- Erosion and Sediment Control Plans for forestry essentially ceased at 1 May with the introduction of the **National Environmental Standard for Plantation Forestry** (NES-PF).
- The NES database is centralised through the Consents database.
- Te Uru Rākau (NZ Forestry) are in the process of carrying out a review of implementation of the NES-PF to date.

9. ENVIRONMENTAL GRANT FUNDING

9.1. Environmental Grant funding is in place to support landowners to undertake works that will reduce erosion and protect the environment. This funding is targeted slightly differently between the Regional Land and Coast environment grant and the WCS grant. Under the WCS, support from WRET enables a greater variety of work to be funded and at higher grant rates.

Table 3: Work area and budget expenditure year to date

	WORK AREA (ha)				BUDGET ($)			
Grant Type	**AP Target**	**Complete**	**Allocated**	**AP % Complete**	**AP Budget**	**Complete**	**Allocated**	**AP % Complete**
WCS	75	147	217	196	103,000*[1]	49,915	202,061	50
RL&C	100	40	212	40	80,000	46,248	150,654	58
Total	**175**	**187**	**429**	**107**	**183,000**	**96,163**	**352,715**	**53**

*Note *1 this is $50,000 Horizons and $53,000 WRET*

- 72 Regional Environmental Grant projects have been allocated. One project transferred from the 2017-18 year.
- 26 of 72 Regional Environmental Grant claims have been completed.
- 68 WCS Environmental Grant projects have been allocated. Seven projects have been transferred from the 2017-18 year.
- 19 of 68 WCS claims have been completed.
- As these projects are claimed these will be charged to the appropriate programme eg. PGF, SLUI and **Supplementary SLUI programme** (SSP). This is forecast to bring the grant levels within budget.

ACTIVITY

General:

9.2. March and April have been reasonably dry and mild throughout the Region. Establishment and survival of seedlings and poles generally has been good. Staff in Ruapehu and Tararua have reported very good survival; however there are areas, such as the Turakina and lower Whangaehu catchments, where drier conditions have been a concern and poles have struggled. Survival rates are expected to be lower than normal at approximately 80% this year.

Soil Health:

9.3. All spring soil samples from have been sent to the laboratory.

9.4. Last year's autumn laboratory results have been received and a report for the 2017-18 monitoring can now be prepared.

9.5. No new autumn sites will be established this year. Staff have been busy with afforestation proposals and mapping within the SLUI work programme.

9.6. One additional soil **Visual Soil Assessment** (VSA) field day was held for a deer discussion group.

Ballance Farm Environment Awards (BFEA)

9.7. The supreme winner field day was held at Simon and Trudy Hales' farm at Weber in the Tararua District with a good turnout. Topics were retirement of the river system, cropping, drainage and riparian management to intercept nutrients.

9.8. Discussion with landowners at the field day resulted in requests for three new SLUI plans.

Photo: Kevin Rooke, Horizons Land Management Advisor (LMA) speaking at BFEA Field day in front of retired section of Akitio River (Cara Hesselin).

Beef + Lamb New Zealand (BLNZ)

9.9. BLNZ has been running a number of farming for profit, on-farm greenhouse gasses and understanding ETS seminars and field days. These are generally well attended and Horizonos Land staff have been available to speak about SLUI, **One Billion Trees** (1bt), and funding support and advice that we can offer.

Poplar and Willow Research Trust (P&WRT)

9.10. The trust has held its Technical Advisory Group AGM.

Other

9.11. Staff attended a Middle Districts Farm Forestry Association meeting at Akitio Station.

9.12. Staff attended a number of other field days and meetings including:

- A Red Meat Profit Partnership meeting in Taihape, resulting in requests for two new SLUI plans;
- Meeting with Forest Management NZ;
- Presentation to Horticulture and Agriculture Teachers Association on the role of regional councils and how land management assists with land use change;
- Meeting with a Massey University PhD candidate to discuss a research proposal on integrating trees into pastoral landscapes;
- Staff provided expert assistance to the Massey University Advanced Soil Conservation field trip;
- Attended a biological farming field day at Makoura Lodge;
- Attended a deep inversion tillage field day run by Massey University and Plant and Food.

9.13. Staff have been involved in farm visits to give advice about carbon opportunities on farm, the 1BT programme (assisting landowners to make applications), shelter plantings, riparian planting, willow pruning and pole planting.

9.14. Staff have completed four fencing claims in coordination with the Freshwater Team.

9.15. Work with the Land Managers' **Special Interest Group** (SIG) that coordinates land management activities across the regional sector has included:

- Holding a SIG meeting in Wellington in March;
- Ongoing discussion with **Te Uru Rākau (TUR)** about the potential for a joint council bid to the 1BT programme and linking this to improving the capability and capacity of the land management sector, including potential for funding training;
- Reporting to the Chief Executives Group;
- Providing support to a TUR programme aimed at better coordination of native plant supply through plant nurseries;
- Planning a workshop on afforestation (funding, right tree, programme support, capability and capacity within regions).

Nurseries:

9.16. Overall supply and demand for poles is becoming clearer and we are approximately 5,000 “A” grade poles short of requirements once all local supply options are taken into account. This was expected as the lumpy nature of new supply from the nurseries will take some time to even out.

9.17. Nursery cutting was planned to start in the northern nurseries in the last week of May. Woodville cutting will commence after Queens Birthday weekend.

9.18. Our Woodville nursery capital upgrade is continuing. The build is complete, with finishing touches including signage ongoing. This winter we will embark on planning for possible irrigation.

Photo: new signage at entrance to Woodville Nursery (John Jamieson)

9.19. Woodville:

- Removing old shelter belt trees and tidy up current waste area in preparation for new stool establishment this winter;
- We hosted Dave Cameron (ex Greater Wellington Regional Council), who is contracted to review current North Island nursery production on behalf of regional councils;
- Exploring options for using fallow ground along line of gas pipeline on the eastern boundary;
- Preparation for harvest in early June.

9.20. Bulls:

- Completed pruning.

9.21. Northern:

- Preparation for harvest in late May.

9.22. Weber:

- Pruning and thinning is complete. Small harvest in June.

Whanganui Catchment Strategy (WCS) and Whanganui River Enhancement Trust (WRET):

9.23. Staff have been completing the claim process for environmental works completed to date.

9.24. Staff have maintained contact with WRET regarding the changes to the grant programme, and will formally report progress to their next meeting in May.

9.25. The MOU with the landowner of the demo farm has expired. Normally a field day is held each autumn. The landowner, Horizons staff and WRET will discuss next steps for this programme. There will be no field day this autumn.

Training & Staff:

9.26. Staff training has included Health and Safety training around 4WDs and trailers, radio use and Vault recording.

9.27. Daniel Regtien, newly appointed LMA for Rangiwahia-Pakihikura area (formerly Dave Harrison), will be based in Marton and was due to start on 27 May. Phil Hodges, newly appointed LMA Technical (formerly Bryan McCavana) was on fixed-term maternity leave cover and will be based out of Whanganui. Josh Penn has been appointed to the new position of LMA Forestry; he is an internal appointment from the Freshwater team and will also be based out of Whanganui.

One Plan Implementation:

9.28. Staff are still providing advice and assistance to landowners regarding their Land Use Consents (vegetation clearance and earth disturbance). Most of the advice revolves around whether the proposed activity is permitted or requires a consent. There were three vegetation clearance operations (two were permitted activity), and six land clearance operations requiring application for a consent.

9.29. Advice to landowners about the need for consents, especially around fords, bridges and culverts, continues.

Next Three Months (May - July):

9.30. This is traditionally the busy period for the team and will include:

- Checking on completion and carrying out claims for environmental grant projects;
- Liaison with nurseries around pole harvest and pole delivery;
- Pole delivery;
- Supervision and assessment of planting projects;
- Complete SoE soil monitoring report;
- Continued liaison with TUR over the 1BT programme, assisting with applications and providing advice and shapefiles to TUR to help them inform their decision making;
- Meet with Te Uru Rākau regarding 1BT options for our Region;

10. SIGNIFICANCE

10.1. This is not a significant decision according to the Council's Policy on Significance and Engagement.

Grant Cooper
MANAGER – LAND & PARTNERSHIPS

Jon Roygard
GROUP MANAGER NATURAL RESOURCES & PARTNERSHIPS

ANNEXES

There are no attachments for this report.

Report No.	19-92
Information Only - No Decision Required	

SUSTAINABLE LAND USE INITIATIVE (SLUI)

1. PURPOSE

1.1. This report is to update Members about progress on Horizons' **Sustainable Land Use Initiative** (SLUI) for the period 1 March to 30 April 2019.

2. EXECUTIVE SUMMARY

2.1. The report provides an overview of progress on SLUI for the 2018-19 financial year.

2.2. Since the SLUI programme began in 2006 more than 35,200 ha of work has been completed.

2.3. The allocated SLUI work programme so far indicates there will be more than 5,400 ha of work (target 3,000 ha) and $2.8 m of grant expenditure by the end of this financial year on June 30 2019. Last year the grant expenditure totalled $1.778 m. Current works allocation suggests use of SLUI reserves may be necessary; however this will depend upon how many works come to claim over May and June.

2.4. The extra funding to the **Hill Country Erosion Fund** (HCEF) through the HCE Funding Boost is reported against targets in this report. This boost in funding is referred to as the **Supplementary SLUI Programme** (SSP). This programme will not meet all of its targets, primarily due to farmers diverting work to Central Government's **1 Billion Trees** (1BT) programme.

2.5. Our successful **Provincial Growth Fund** (PGF) application has added further funding to SLUI and other grant-funded programmes but is reported within this programme as the bulk of the targets are SLUI-related. This programme is largely on track to meet its targets.

2.6. Horizons has secured a total of $6.493 million of Central Government funding over the next four years through the Hill Country Erosion Fund (HCEF). This represents a 55% increase in the baseline SLUI funding when compared to this year. The amount of funding approved and the allocation of funding to work streams changes from year to year. Staff have worked through the implications of these changes with **Te Uru Rākau** (TUR), Forestry NZ. The contract is on track to be signed by early June.

2.7. The new Central Government funding for the next four years is for specific works types. Forecast interest in forestry (forestry and manuka) for next year exceeds the combined resources for the HCEF funding and Horizons rates, with approximately 7,000 ha of forestry interest signalled for this year. Staff have been working with Te Uru Rākau around potential funding through 1BTand some work will clearly be able to be diverted to the 1BT programme. However, this has differing requirements and payment schedules to Horizons grants and may not be considered feasible by some landowners for the work they have proposed. At this stage the forecast is that Horizons will not be able to meet the demand for grants for forestry and some may not go ahead as planned. Staff have worked through the options on revised grant rates and allocation arrangements, and these are detailed in another report to this meeting.

3. RECOMMENDATION

That the Committee recommends that Council:

a. receives the information contained in Report No. 19-92.

4. FINANCIAL IMPACT

4.1. There are no direct financial impacts associated with this report. However, it does update Members on a number of financial matters associated with SLUI, the PGF and SSP.

5. COMMUNITY ENGAGEMENT

5.1. Consultation was carried out through the 2012-22 **Long-term Plan** (LTP) submission process and the recent Annual Plan process.

5.2. The Ministry **of Primary Industries** (MPI) has a key role in part funding and overseeing this activity.

5.3. The SLUI Advisory Group is updated approximately every six months about progress with this programme and receives copies of these agenda items. The group last met on 25 September. The next meeting is planned for June 11.

6. SIGNIFICANT BUSINESS RISK IMPACT

6.1. There are no significant risks inherent in the adoption of recommendations contained in this report.

7. BACKGROUND

7.1. SLUI has been in operation in Horizons' Region since 2006. The initiative, targeting hill country erosion, is funded from Central Government's HCEF plus Horizons' rates and farmer contributions.

7.2. MPI is contracted to contribute to SLUI $1.15 m of its $2.2 m in total available funds through the national HCEF this year. The Government's 2018 May budget announcement added $1.8 m to this fund.

7.3. SLUI is delivered by Horizons in partnership with the HCEF and MPI, through a contracted works programme which sets targets for plans and works completed.

7.4. This report is delivered in year four of a four-year contract with MPI, which runs until 30 June 2019.

7.5. This year's work programme includes an additional $310,750 though SSP and $970,600 through PGF co-funding for work in the Region. Funding has also been secured through other Central Government sources including the Afforestation Grants Scheme. Further details are provided later in this report.

8. REPORT ON PROGRESS

Contract and Annual Plan Targets (2018-19)

8.1. The claim process continues to increase as autumn fencing projects are completed. This year, with a relatively dry autumn, it is clear that fencing projects will continue to be completed through June and July.

8.2. The contract targets for 2018-19 are:

- 28,000 poles planted;
- 900 ha of non-retirement work;
- 1,150 ha of forestry established;
- 350 ha retired;
- 500 ha riparian retirement;
- 100 ha managed retirement;
- 15,000 ha of farm plans mapped;
- 11,500 ha of land in priority area under farm plans; and
- 1 sediment monitoring report.

Note the Horizons Annual Plan target for farm plans mapped is 20,000 ha.

SSP

- 2,000 poles planted;
- 500 ha reversion;
- 13,000 riparian plants established;
- 2 on-farm assessments for poles entry into **Emissions Trading Scheme** (ETS);
- 1 case study on-farm.

PGF

- 1.3 m trees established on 1,000 ha;
- 20 customised forestry investment appraisals completed.

8.3. Progress against these targets is reported later in this document.

Whole Farm Plan (WFP) Production

8.4. WFPs are a tool for both bringing new land into the programme and for allocating grants to the various land types (priority land). An important part of maintaining the momentum of SLUI is the ability to bring new farms, new land and new work into the programme. This table shows the plans completed in SLUI's **Life to Date** (LTD) and progress in bringing new plans on board.

Table 1: WFP Production (Life to Date)

No. Plans	Hectares	Comments
707	529,145	WFPs completed in SLUI to 30 June 2018
0	0	**Less** plans completed but not yet delivered to farmers (from 2017-18).
21	14,762	**Plus** plans completed in 2018-19 and delivered to farmers
728	543,907	**Equals** landowners / hectares able to be engaged in SLUI WFP implementation
6	2,118	Plans / ha mapped in 2018-19 but yet to be delivered to farmers
15	6,555	Plans allocated to contractor for 2018-19, yet to be mapped
0	0	Committed to a plan and on the list for 2018-19, yet to be allocated

- All 45 plans (28,133 ha) from 2017-18 have been completed and delivered to landowners with 42 of the 45 having agreed on a work programme.
- Of the 21 plans delivered from the current financial year, 18 landowners have already agreed to a works programme, although works are unlikely to start until autumn or winter.
- There are now 42 plans allocated to the contractors for this financial year, down from 43 in the last report as one plan is on hold at the landowner's request. This brings the hectares allocated to this financial year to 23,435 which exceeds the Annual Plan target of 20,000 ha.
- There are 12 plans totalling 6,258 ha with documentation returned. The plans will be the first allocated to the 2019-20 programme.
- We are awaiting the return of information documents from a further 39 farms and more than 24,000 ha. Those still with paperwork out have been prioritised by: having existing plans, being on Top and High Priority land and the Oroua Catchment, and likelihood of doing works.

Whole Farm Plan Implementation (2018-19 Year)

8.5. The implementation rate of WFPs provides a measure of uptake of work during the year. The number of landowner contacts made, the amount of work completed to date and the projections for work this year are shown in Table 2.

Table 2: WFP Implementation (Current Year – actual YTD 2018-19)

No. Plans	Hectares	Comments
707	529,145	Plans completed by 30 June 2018 have been delivered and the landowners have had time to consider and start their works programmes this year. (see Table 1)
268	1,327	Work completed and claimed through the grant process (300 claims)
332	5,476	Indicative commitment to works 2018 -19 (518 claims)
0	n/a	Plan reviews and five-year programmes completed this year

- Hectares to be completed have increased since the last report from an estimated 5,312 to 5,476.
- The estimated number of plans with works being carried out, and hectares of work to be completed, change throughout the year and staff are in contact with farmers to keep up to date on progress. Autumn fencing programmes remain problematic with landowners committed to the work but unable to complete it by year's end. We are continuing to monitor outstanding works and believe the final works coming to charge will be fewer than landowners have indicated.

Whole Farm Plan Activity

8.6. While contract targets focus on the number of plans completed, the activity of individual plans is another measure of SLUI activity. The number of plans active in any one year can and does change. Figure 2 tracks the number of plans that have had no activity at all in terms of implementation of grant works. This measure is complicated by new plans coming into the programme during the year.

Table 3: WFP Activity Life to Date

No. Plans	Hectares	Comments
707	529,145	Landowners able to be engaged in SLUI WFP implementation (see Table 1)
597	35,575	Active plans completed; 3,525 individual claims or an average of 5.9 claims per plan

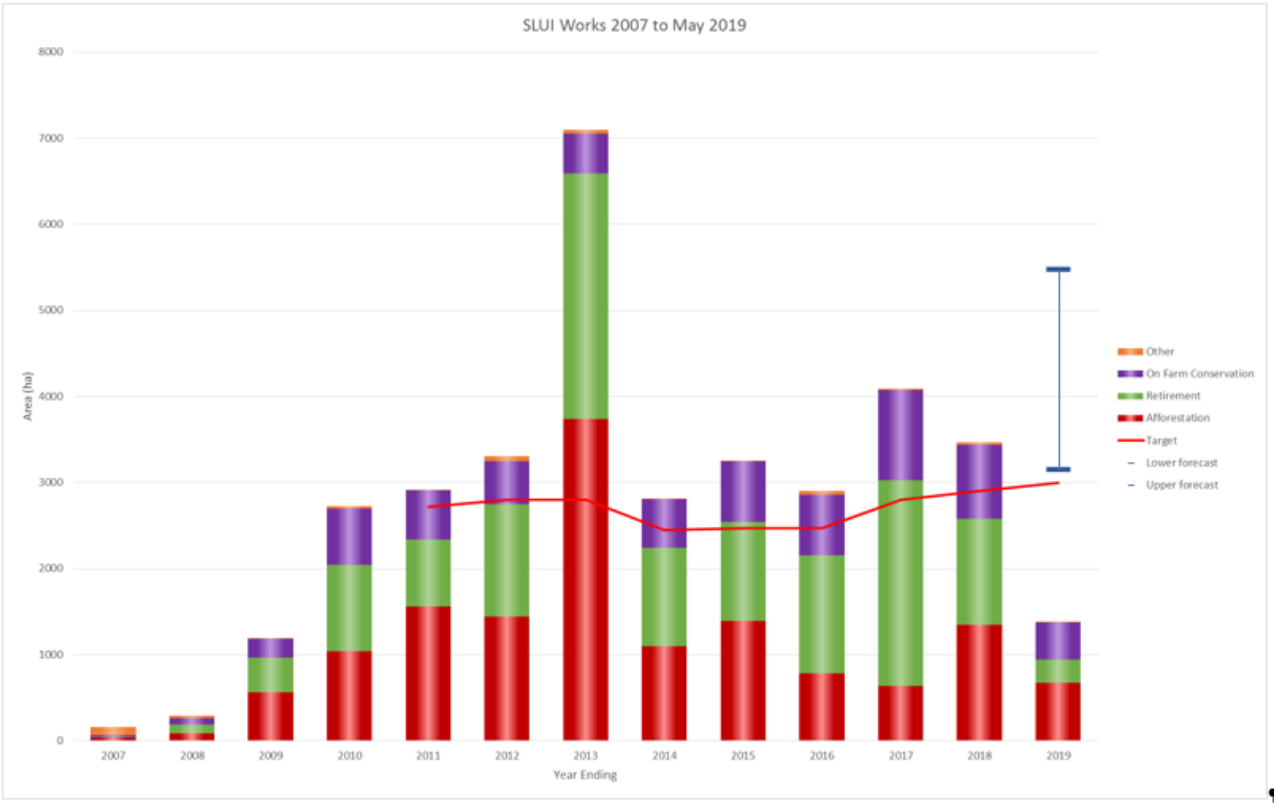
- At the time of this report there are 597 active plans involved in the work programme (Table 3) and this is increasing as more plans are completed and previously inactive plans have works carried out. There were 540 active plans at June 30, 2017 and 552 in January 2018.
- The ratio of active to inactive plans has improved considerably. In 2010 there was approximately one active plan to one inactive plan, but by the end of June 2018 this had improved to more than four active plans for every inactive plan; at the end of April the ratio was approximately 1:4.8.
- In the early part of every financial year we expect a slight rise in the number of inactive plans as the new plans are delivered and there is a lag before the work programmes commence.

Table 4: Trend of active vs. inactive plans over the life of SLUI

	Total Plans	Active	Inactive	% Active
<2 years	51	24	27	47%
2-5 years	132	102	30	77%
>5 years	539	471	68	87%
Total	**722**	**597**	**125**	**83%**

- The data in Table 4 (597 active plans) shows six newly active plans since the last report to the Catchment Operations Committee.
- Of the 27 inactive plans that are less than two years old, our contacts with landowners suggests 10 are yet to agree on a works programme while the other 17 will have started work but not yet had a claim recorded to become “active”.
- Of the 10 plans: four are from 2017-18 and two are likely to start work this winter, while one has started but no claim has been completed. The six plans from 2018-19 have been delivered to the landowners since March 2018.
- The continuing trend is for one to two plans older than two years to go from inactive to active every two months.

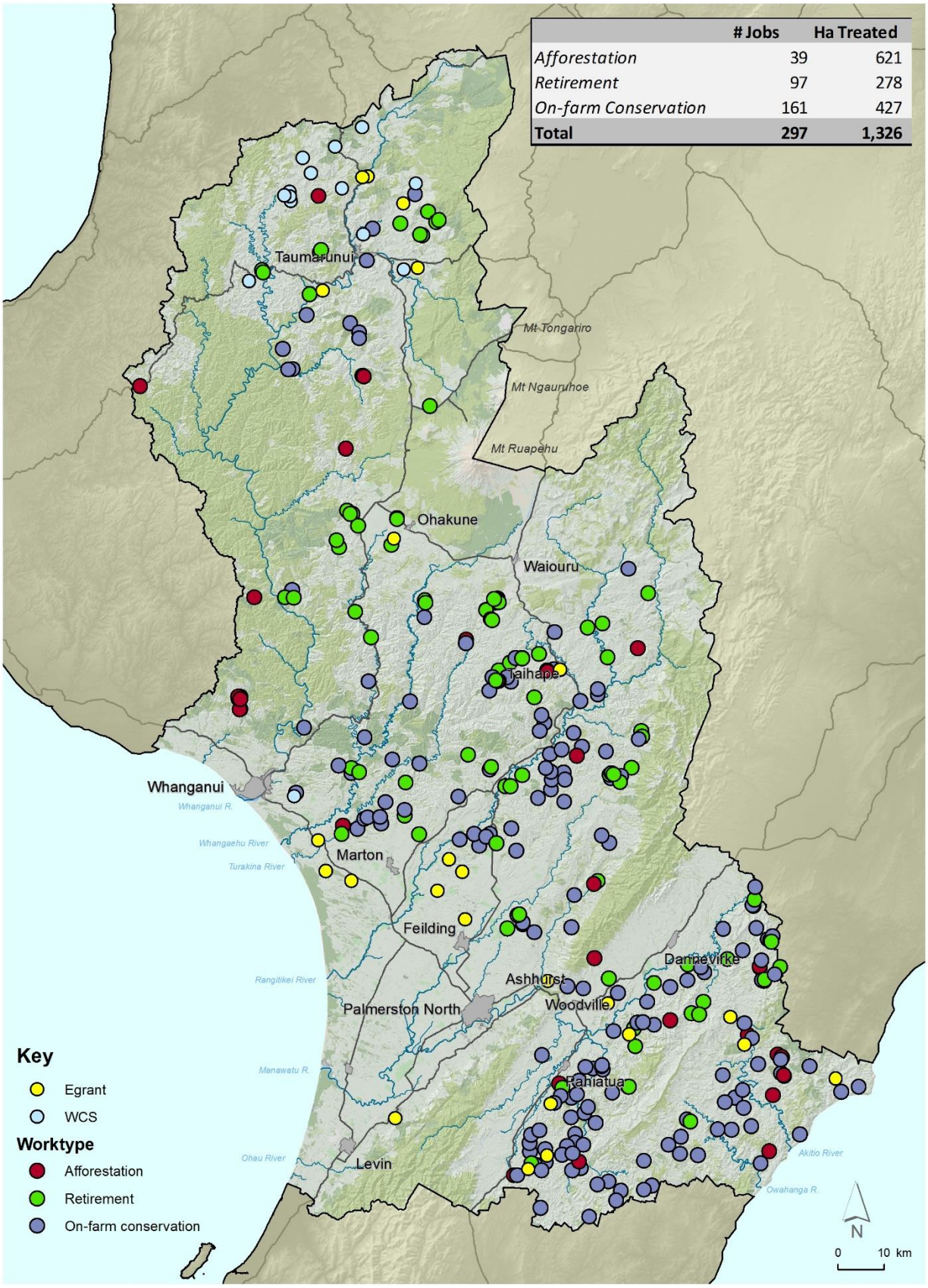
SLUI Life to Date Achievements (by work type)



Graph 1: SLUI works completed by work type during the life of the programme against annual contract targets (red line). *NB the SSP and PGF targets are not shown in this graph.*

8.7. Graph 1 shows the annual works completed in the programme, indicated by work type:

- Each year since 2010 the contract target for hectares of works completed has been exceeded.
- The amount of work completed was relatively stable from 2010-16. However, 2013 was an exceptional year with 3,224 ha of afforestation.
- This was due to uptake of Afforestation Grant Scheme and retirement projects in association with Ngā Whenua Rāhui.
- The 2017-18 year was the third largest work year, largely due to an increase in the afforestation category with an increase in mānuka planted.
- The 2017-18 year was also the largest year by individual jobs (claims) completed with 437 claims, six more than the previous year.
- Until June 2018 Afforestation (red) made up approximately 40% (13,694 ha) of the work completed and retirement/riparian retirement (green) 40% (13,852 ha). These two work types account for the bulk of the hectares of work completed during the life of the programme.
- The on-farm conservation (purple) is predominantly space planting and gully planting with poles but also includes structures and earthworks. It makes up 19% (6,537 ha) of the work by area to 30 June 2018. In total, the programme has planted more than 164,000 poplars with 27,634 ha planted in 2017-18. We expect to exceed that number this year with more than 30,000 poles allocated.
- Overall allocation for 2018-19 indicates a total of 5,870 ha for the year; however actual levels delivered are likely to be less than that as experience shows not all allocated works eventuate.



	# Jobs	Ha Treated
Afforestation	39	621
Retirement	97	278
On-farm Conservation	161	427
Total	**297**	**1,326**

2019 Worktype Locations

Map prepared by W McKay, NRP Group on 23/05/2019

Map 1 Location of all grant works completed and claimed from July 1 2018 to December 31 2018.

Year to Date Achievements

8.8. Table 5 shows the types of works completed and claimed this financial year.

Table 5: Works YTD (completed and claimed, by grant amount and land priority)

	2018-19				Priority Land Type (ha)			
Work Type	**Claims**	**Farms**	**Grant $**	**Total ha**	**Not Erodible**	**Erodible**	**High Priority**	**Top Priority**
Afforestation	39	30	522,719.56	621.2	11.0	160.9	291.7	157.6
Retirement	17	15	53,980.18	62.2	3.2	14.1	5.6	39.3
Riparian Retirement	69	51	450,222.08	197.6	24.2	56.3	27.4	87.9
Wetland Retirement	10	9	33,812.80	9.9	2.6	3.3	0.4	3.2
Managed Retirement	1	1	18000.00	7.8		0.9	5.8	1.2
Space Planting	160	158	205,877.39	424.6	12.5	241.5	121.3	49.4
Gully Planting	1	1	5,357.50	2.6		2.3	0.3	2.6
Structures and Earth	1	1	6,853.64	0.7				0.7
Other	2	2	129.65	0.2				0.2
Total	**300**	**268**	**1,251,952.80**	**1,326.8**	**53.5**	**479.3**	**452.4**	**339.4**

- 1,327 ha of works (44% of the 3,000 ha target) have been completed and claimed this year.
- 792 ha (60%) of works completed are on Top Priority and High Priority land.
- Afforestation claims completed include 32 projects funded through PGF which have had a grant cost of $309,090.

Forecast v Actual (targets vs actual by work type)

8.9. Table 6 shows the forecast figures against target for 2018-19. The work programme is fluid and changes throughout the year. Some of the changes are due to postponements or cancellations and some due to new plans coming on stream and bringing in new work programmes.

Table 6: Proposed work 2018-19 (Contract v Forecast v Actual) and difference Forecast to Contract

Work Type	Contract Target Ha x1,000	Forecast Ha	Actual Ha	Dif Ha	Dif %	Target $ x1,000	Forecast $ x 1,000	Actual $ X 1,000	Dif. $ x1,000
Afforestation	1,150	2,124 *B	621	974	185	747	286	523	-461
Retirement	350	2,004	62	1,654	573	179	474	54	295
Riparian Retirement *A	500	628	208	128	126	750	1,375	439	625
Managed Retirement	100	51	8	-49	49	20	37	18	17
Space Planting and Gully Planting	800	647	427	-153	81	345	265	211	-80
Structures/Earthworks	100	1	1	-99	1	30	9	7	-21
Other (inc blank)		20	-	20	-	33	47	0.1	-14
Total	**3,000**	**5,476**	**1,327**	**2,476**	**183**	**2,104**	**2,495**	**1,252**	**391**
SSP: 2,000 poles (57 ha)	57	57	-	-	-	55	55	5	**-**
SSP: reversion	500	500	-	-	-	500	500	-	**-**
PGF: 1.3 m trees	1,000	1,049 *B				1,283	910	304	**-373**
Total	**4,557**	**5,870** *C				**3,942**	**4,321**		**379**

**A – includes wetland*

**B – afforestation and PGF forecast in total is for 1,377 ha. This will include PGF PGF/SLUI, free manuka, and Afforestation Grant Scheme work on SLUI farms. The PGF alone proportion of this planting is 1,049 ha, but this will include non-SLUI farms.*

**C – The total ha of work forecast for completion will be through joint funding by SLUI, SSP and PGF.*

SLUI

8.10. The following bullet points update works on SLUI farms. The next section provides updates on a broader land area:

- The target for works for 2018-19 is 3,000 ha and at this stage we are forecasting 5,476 ha to be completed. All numbers are changing at the moment as staff are reporting cancellations as well as new works; at the lower end of the scale the minimum work expected to come to claim is 3,152 ha. There are one or two large afforestation jobs still to claim (mānuka planting where staff have wanted to see survival rates later in the season before committing to a claim), and more than 150 fencing jobs to be completed.
- The value of grant work forecast to be completed by the end of the 2018-19 year is now $2,495,000, down from $2,856,000 reported last period. Some of this is due to cancellations but the bulk is due to splitting the afforestation, which will be PGF funding, off from the SLUI grant cost. The $2,495,000 is still above the budgeted level of $2,104,000. This would signal possible use of SLUI reserves, but it is still too early to make accurate forecasts for overall expenditure; last year approximately 70-75% of allocated expenditure came to charge.
- The SLUI contracted afforestation target of 1,150 ha will include some SLUI properties where the grant is paid by PGF or PGF/SLUI. The total ha proposed under SLUI/PGF/ SLUI & PFG/and free manuka on SLUI properties was 1,021 ha and 1.6 million trees. An additional 356 ha and 519,000 trees will be reported through SLUI targets as staff facilitated AGS funding for establishment on SLUI properties.
- SLUI has a contracted space and gully planting target of 800 ha. This will be reported separately from the SSP target of 2,000 poles (the equivalent ha target is 57 ha). At this stage the grant paid under SLUI is $211,234.

Wider Land Programme

8.11. The following bullet points include works on SLUI farms and other farms as the PGF programme was not limited to works on SLUI farms:

- The PGF or PGF/SLUI projects which have been approved have an estimated grant cost of $910,800 and 1,350,524 total trees. To date 41 of these projects have been claimed with a grant cost of $448,808 and 501,802 trees planted.
- The TUR agreement to fund free mānuka seedlings has resulted in four other projects taking place on SLUI properties, with approximately 648,000 seedlings being planted. Horizons staff have been involved in these jobs, which were originally identified through SLUI. Staff assisted landowners to complete funding applications and implementation of works. All of the free mānuka projects received SLUI grants for some component of the works.
- The SSP project proposed 500 ha of reversion but this work has not eventuated. Two landowners were interested and one has made an application through 1BT while the other is considering plantation mānuka through 1BT rather than reversion. The announcement of grants for reversion as part of the One Billion Trees programme, after the funding provided via SSP, has effectively diverted planned work to the One Billion Trees programme.

9. ACTIVITY SUMMARY

Season

9.1. The past two months have been warm and a little drier than normal. Tree survival has generally been good, with poles in most areas with greater than 90% survival. The exception to this is the Turakina and lower Whangaehu catchments where pole survival is lower and it is expected some poles will not leaf up next spring.

Staff activity

9.2. Staff are contacting landowners to confirm works are on track and complete claims where possible; 78 claims have been completed since the beginning of April. Landowners have had a dry autumn and fencers are still on site. It is expected claims will continue to come to charge right through winter.

9.3. Staff have had a number of enquiries from landowners wanting to know how the 1BT programme could work for them and have assisted with applications, but at this time no approvals have been received from TUR. This poses some risk to us as landowners may come back to Horizons for funding on jobs we haven't budgeted for, but for which we have supported 1BT applications and which are eligible for SLUI grants.

9.4. Staff have been involved with a number of small block holdings on the Whanganui River with iwi land. Producing WFPs or the new paddock map works programme are possibilities for this land.

9.5. A number of pre-plant inspections have been carried out on mānuka and forestry blocks where staff have given advice on consenting requirements under the **National Environmental Standards** (NES) for Production Forestry, any areas requiring added protection with regard to biodiversity and erosion control, and areas where grant assistance can be provided.

9.6. Fencing claims are progressing well with a dry autumn but staff have been noting that fencing costs, especially for labour, are increasing.

9.7. A number of inspections have been carried out for the forestry appraisals as approved under the PGF funding. Staff have accompanied the landowners and consultants on these inspections. By mid-May, 17 of the 21 inspections had been completed and six of 21 reports had been returned to landowners.

Contract

9.8. The current HCEF programme is continuing as planned and four milestone reports (August, October, February and March) have been completed for TUR, along with funding invoices in October, February and March.

9.9. The SSP's first milestone report was completed in February, along with a funding invoice. This milestone focused on the establishment of 2,000 poles in the Ruapehu area. The second milestone report, due at the end of May, will note that we have been unable to meet the targets for 500 ha of Reversion as proposed. Landowners contacted have decided to apply for reversion under 1BT funding.

Two milestone reports have been completed under the PGF tree planting programme (November and December), with an invoice for the December milestone. The final milestone report and invoice is due at the end of May.

9.10. Agreement has been reached with TUR around funding and milestones for the new HCEF contract starting in July.

9.11. Progress against SLUI contract targets is shown in Table 7.

Table 7: Progress against MPI contract targets (Year to Date)

Target		Current	Comment
28,000	Poles planted	Approx. 16,600 claimed to date	Planting completed; may not exceed target as fewer claims than expected coming to charge
900 ha	Non-retirement work	428	Mostly related to pole planting, see above comments
1,150 ha	Forestry established	621	Underway; planting to be completed this spring, will exceed target when included with PGF and AGS
350 ha	Retired	62	Underway, will exceed target
500 ha	Riparian retirement	208	Some carry over from last year, will exceed target
100 ha	Managed retirement	8	Will not meet target
15,000 ha	Farm plans mapped	14,433 mapped but plan not complete	Contractors have more than 23,400 ha to map to date, will exceed target
10,500 ha	Land in priority area under farm plans		Not assessed yet
1	Sediment monitoring report		Not planned (variation requested)
2,000	SSP – Poles planted Ruapehu (57 ha)	2,000	Planting completed, have met target.
500 ha	SSP - Reversion	0	Will not meet target, no work planned
2	SSP – ETS space planting assessments		Two landowners confirmed, and consultant engaged
1	SSP – ETS case study (from above assessments)		One case study and an info sheet planned
13,000	SSP – Riparian plants established		Checking with riparian planting projects, will meet target
1.3 m	PGF – trees planted of various species	501,802	Planting completed, claims coming in; approximately 1 million trees expected to be claimed.
20	PGF – customised forestry appraisals		**Return on Investment** (ROI) completed, consultants engaged, site inspections on-farm have commenced. 17/21 inspections complete. Will achieve target

Operational Plan Work Streams

- This section discusses completion of internal targets and progress on issues outlined in Sections 5 and 6 of the SLUI Operational Plan. Some progress on issues is noted, including:
  - Maintain WFP database wait time, with average 250 days. The average for this year so far is 159 with a range from 80 to 284 days.
  - 90% of previous year's plans are being implemented or agreed by December following the plan being completed. For February 2019, the figure for 2017-18 plans was 91%, and for this year's plans 19 of 25 plans (76%).
  - Provide SLUI scholarships with two awarded this year.
  - Provide holiday work to SLUI scholarship students. This year we have a former student on a fixed-term contract to support improvements to the SLUI database.

- Audit/monitor works on at least five existing WFPs. This work has started with seven site visits completed. We had hoped to complete 10 full site visits but staff have been busy inspecting and mapping forestry proposals for this winter's planting.
- Maintain staff training with at least two internal training sessions. One session has been held with a site visit to a farm being converted to a mānuka plantation near Taihape. Further training is planned around pole delivery in early June.
- Manage applications for grants in excess of $20,000 via a "large grants" process. There are 15 approved large grant jobs this year with a total grant cost of $720,419.
- Maintain grant allocations spreadsheets. These are updated regularly and reported via Table 5 of this report.
- Maintain **joint venture (JV)** forests to meet contract and budget targets, including insurance and audit. See section below.
- Review some aspects of the grant programme. This remains a work in progress. Some options for variation to grant rates were presented to a Council workshop in March. This outlined grant rates for properties without a full SLUI plan as well as some changes to afforestation grants based on a cap per property.

Joint Venture Forestry

9.12. Silviculture work has been completed. There is some minor tracking work to be undertaken before the end of the financial year.

9.13. The consultant has completed the annual forestry valuation in time for end of year financial reports. The report notes:

"Therefore, **this forest valuation, which is effective 30 June 2019** notes that, based on the assumptions in the report following and using an 8% discount rate on all ages of forest, the forest's value lifts from $4,021,645 in June 2018 to **$4,816,458 in 2019 with an indicative harvest value of $26,952,295** (up from $25,454,055 in 2018) over time."

NEXT THREE MONTHS (May - July)

- Continue on claims for work programme, including assessments of survival in order to meet milestone targets for PGF claims.
- Deliver and discuss work programmes from the new 2018-19 plans.
- Continue with landowner contacts for five-year reviews and non-active plans.
- Maintain WFP priority process.
- Complete and sign contract with HCEF.
- Complete the procurement process for WFP mapping as the current contract expires at the end of this financial year.
- Complete field visits with forestry and land use consultants to prepare land use assessments. Receive assessments from contractors.
- Begin pole delivery and advice, support planting where necessary.
- Complete all SSP, PGF and SLUI reporting and invoicing.

10. SIGNIFICANCE

10.1. This is not a significant decision according to the Council's Policy on Significance and Engagement.

Grant Cooper
MANAGER – LAND & PARTNERSHIPS

Jon Roygard
GROUP MANAGER NATURAL RESOURCES & PARTNERSHIPS

ANNEXES

There are no attachments for this report.

Report No.	19-94
Information Only - No Decision Required	

HILL COUNTRY EROSION AND SEDIMENT MANAGEMENT IN THE MANAWATU WHANGANUI REGION

1. PURPOSE

1.1. This report is to update on the issue of sedimentation of rivers in the Manawatū-Whanganui Region including an overview of the various programmes to manage this including hill country erosion management, science and monitoring and linking the work in the catchment with outcomes in the river for water quality and flood protection.

2. EXECUTIVE SUMMARY

2.1. Hill Country Erosion was identified as one of the four key issues of the One Plan and sedimentation of rivers is identified in the 30 Year Infrastructure Strategy for the regions flood protection assets primarily due to the potential impact on levels of service for flood protection schemes. Climate change is also identified as a key issue in the 30 year Infrastructure Strategy in part due to its impacts on sedimentation in rivers.

2.2. Horizons has active implementation programmes to address and reduce sedimentation of rivers including the Sustainable Land Use Initiative for managing hill country erosion and management of stream bank erosion through the River Management Group's activities and the Freshwater and Partnerships Team's activities.

2.3. Through the Long-term Plan Horizons committed further funding to science in relation to the issue of sedimentation in rivers to inform the activities of council in relation to this issue. This report provides an update on the science that is being delivered through a cross organisational team with support from a range of external scientists.

2.4. The report also overviews the issue of hill country erosion in the region and progress on this, how these works are projected to influence outcomes for sedimentation in the regions rivers, and water quality state and trends for sediment indicators.

3. RECOMMENDATION

That the Committee recommends that Council:

a. receives the information contained in Report No. 19-94 and Annex.

4. FINANCIAL IMPACT

4.1. There is no financial impact of this item. The issue of sedimentation of rivers may have a financial impact for the Council into the future.

5. COMMUNITY ENGAGEMENT

5.1. This item is a public item.

6. SIGNIFICANT BUSINESS RISK IMPACT

6.1. This item is not considered a significant risk impact. The issue of sedimentation in rivers and impacts on levels of service has been identified as a key issue for the 30 year

infrastructure strategy signalling that it is an important issue and does pose some risk for the Council and the community.

7. BACKROUND

7.1. This report presents a progress update on our hill country erosion programme the Sustainable Land Use Initiative (SLUI), our current in stream sediment monitoring programme, state and trends of water quality sediment indicators and new techniques we've recently employed to further improve our understanding of sediment erosion and the issue of sedimentation in rivers. This first section provides a broad overview of some of the impacts of sediment in rivers.

7.2. Like nutrients and algae, sediment is a natural component of any waterway. As mountains and hills erode and waterways shift, loose soil, rocks, mud and silt are washed from the surrounding landscape into our rivers and streams.

7.3. Sediment also enters our waterways as a result of human activity through gravel extraction, in-river works, recontouring of land, earthworks and run-off from urban storm water drains. It can also be released from stream banks and riverbeds.

7.4. Sediment loads vary across the region depending on catchment slope and geology, vegetation coverage and type, and how surrounding land is used. Some of our rivers receive high levels of fine sediment made up of sand, silt and mud.

Sediment effects on life supporting capacity

7.5. Within the stream, particle size determines the type of impact on aquatic life. Large-sized material will determine river morphology and habitat type while the fine particles will influence water clarity and colour (sediments suspended in the water column) and habitat quality (fine sediment deposited on the riverbed).

7.6. Sediments suspended in the water column can have effects on fish, invertebrates and plants. The effects on fish include disruptions of the migration movements, reduction of the sight feeding range, or direct abrasion of the gills. Effects on invertebrates include clogging of gills and food catching ability. Suspended sediments also have an effect on photosynthetic depth (depth at which there is enough light to allow plants and algae to grow), thus affecting plant and algal communities.

7.7. Sediments deposited on, and in, the riverbed can impact on aquatic micro-habitat quality, particularly by filling the interstitial space between rocks, cobble and gravel, where many invertebrates live. It can also reduce survival and development success of instream spawning native fish and trout spawning success by reducing the interstitial flow of water and oxygen concentration through smothering of habitat. When sediment is deposited in riparian margins similar effects are likely to occur for the species that spawn in riparian habitat. Substantial deposition of sediment can also affect macro-habitat. For example it can reduce water depth, and thus cover for fish, in pools.

7.8. Sediment also carries with it other contaminants that are bound to it such as nutrients (particularly phosphorus) and heavy metals. The nutrients that are bound to the sediment can under different river conditions become available for uptake by plants and algae in stream contributing to excessive algal growth. Potentially toxic algae (phormidium) is known to have the ability to capture sediment within the mat and mine phosphorus from the sediment for up to 20 hours of the day due to pH and oxygen concentrations within the mat. This gives it a competitive advantage in streams that are low in dissolved phosphorus within the water column.

Effects on other values

7.9. Sedimentation effects on levels of service has been identified in Horizons' Long Term Plan 2018 Infrastructure Strategy as one of the significant infrastructure issues over the next 30 years for the region. Managing sediment can influence outcomes for water quality and the effects of sedimentation on levels of service of our flood protection schemes.

8. DISCUSSION

SLUI progress

8.1. Following the 2004 flood events, Manaaki Whenua were commissioned to develop a model to spatially predict the amount of 'Highly Erodible Land' (HEL) in the Manawatū-Whanganui Region to give direction for targeting effort under Horizons erosion control programme, the Sustainable Land Use Initiative (SLUI). This analysis of HEL was later extended across the country and found that Manawatū-Whanganui Regional Council has the largest area of HEL on private land in New Zealand (NZ), 22% of NZ's HEL in approximately 8% of NZ (Table 1).

Table 1: Percentage of Highly Erodible Land by Regional Council.

Source Robb and Brown, 2018	HEL with non woody vegetation outside DOC estate	
Region	**% of national total**	**% of land within the region**
Manawatu-Wanganui Region	22%	11%
Canterbury Region	14%	4%
Gisborne Region	12%	16%
Hawke's Bay Region	11%	9%
Northland Region	9%	8%
Waikato Region	7%	3%
Otago Region	6%	2%
Marlborough Region	5%	6%
Wellington Region	5%	8%
Taranaki Region	5%	7%
Southland Region	1%	0%
Tasman Region	1%	1%
Bay of Plenty Region	1%	1%
Auckland Region	1%	1%
West Coast Region	0%	0%
Nelson Region	0%	2%

8.2. The analysis of highly erodible land predicted approximately 263,000 ha of HEL in pasture land use and a further 200,000 ha of HEL with woody vegetation cover (protected HEL). To further target efforts within this large area of land in the region, Horizons developed a classification of target land into categories of Top, High Priority, Erodible and Not priority as shown in Table 2 below. The Table also provides a broad estimation of the sediment contribution per year on a square km basis and an estimate of what proportion the sediment contribution from each of these categories of land to rivers is likely to be.

8.3. While these are broad estimates, they show that top priority land is likely to contribute 40 to 55% of the sediment in the region's rivers and high priority land is likely to contribute a further 25-30% of the sediment. This makes top and high priority land the main target for the programme. However, targeting the erodible land is also important as that part of the farm as an overall area is likely where the predominate overall productivity of the farm is based and this land is also susceptible to erosion.

Table 2: Land classification by priority with sediment contributions.

Land Priority	Erosion to land	Erosion to water	Typical LUC class	Broad estimate of sediment (T/km^2/year) (pasture)	Sediment contribution to region's rivers
Top priority	Severe to extreme	Moderate to severe	7e, 8e, some 6e	5000	40 – 55 %
High priority	Moderate to severe	Slight to moderate	7e, riparian 6e	1000	25 – 30 %
Erodible	Slight to moderate	Slight	6e, riparian 1-5	200	15 %
Not priority	Negligible	Negligible	Non-riparian 1-5	50	2 %

8.4. Horizons has New Zealand's largest hill country erosion programme, the Sustainable Land Use Initiative. Over 11 years, with central government support $79 million has been spent resulting in over 34,000 ha of works. At the current pace, treatment of the top priority and high priority land is predicted to take in the order of 110 and 300 years respectively.

8.5. SLUI has completed farm plans for over 700 farms covering more than 500,000 ha of land. The on-farm mapping is more detailed than the regional mapping used to predict the amount of HEL in the region. The detailed on-farm mapping has confirmed the overall quantification of the size of the issue from the regional mapping exercise is accurate, however the regional mapping is correct around 50% of the time in locating the HEL within the region, reinforcing the need for the on-farm mapping to confirm the HEL areas at a farm scale.

8.6. SLUI was previously operated from a model where Whole Farm Plans are produced and works are completed in the areas of the Whole Farm Plans. Analysis of the area of Whole Farm Plans produced to date in the context of the amount of land in the region that is in the categories Top Priority, High Priority, Erodible and Not Erodible land (Table 3) shows that approximately half of the top and high priority land is within SLUI Whole Farm Plans. The recent application to the Hill Country Erosion Fund proposed a change where SLUI funds could be applied to areas without a SLUI Whole Farm Plan. Two new tools are proposed to ensure any areas treated are mapped. These are the SLUI Whole Farm Map and the SLUI Paddock Map.

8.7. Currently, 49% of the Top and High Priority land is within Whole Farm Plans, with the balance of 51% outside SLUI Whole Farm Plans. In line with the above mentioned changes, the previously separate Whanganui Catchment Strategy (WCS) – established before the SLUI will be integrated into the programme. This includes 39 WCS plans covering approximately 22 000 ha.

8.8. Further detail on the status of the erodible land in the region is possible through reporting of the amounts of erodible land in farm plans that is in pasture and the amount in woody vegetation (protected) as shown in Table 4 below. Changes in this table provides a measure of progress. Note that some areas already considered protected by woody vegetation are included in new works depending on the farm. Over the course of SLUI has completed over 35,000 hectares of works, with approximately 22,000 of these being on highly erodible land in pasture.

8.9. The targeting of farm plans and works also uses a prioritisation system for priority farms that Horizons has developed and target Top and High priority farms based on the classification above of top priority, high priority and erodible land. At present SLUI has 55% of the 341 top priority farms within the programme and 32% of 769 the high priority farms (Table 5).

Table 3: All highly erodible land by category that demonstrates the area within Whole Farm Plans and outside of Whole Farm Plans.

All highly erodible land (in pasture or woody vegetation	**Mapped in SLUI Whole Farm Plans (WFP) (ha)**	**Additional private land (ha)**	**Total (ha)**	**Percentage in SLUI WFP**	**Percentage outside SLUI WFP**
Top priority	68,000	67,000	135,000	50 %	50 %
High priority	126,000	136,000	262,000	48 %	52 %
Erodible	237,000	438,000	675,000	35 %	65 %
Not priority	96,000	273,000	369,000	26 %	74 %
Total	527,000	914,000	1,441,000	37 %	63 %
Sum top and high	194,000	203,000	397,000	49	51

Table 4: A further breakdown of area mapped both within and outside Whole Farm Plans by woody vegetation (protected) and pasture.

	Mapped in SLUI			Additional private land			Total		
	Total (ha)	In pasture (ha)	In woody vegetation (ha)	Total (ha)	In pasture (ha)	In woody vegetation (ha)	Total (ha)	In pasture (ha)	In woody vegetation (ha)
Top priority	68,000	30,000	39,000	67,000	29,000	38,000	135,000	59,000	77,000
High priority	126,000	99,000	27,000	136,000	107,000	30,000	262,000	206,000	57,000
Erodible	237,000	207,000	29,000	438,000	385,000	54,000	675,000	592,000	83,000
Not priority	96,000	92,000	36,000	273,000	262,000	10,000	369,000	354,000	46,000
Total	**527,000**	**428,000**	**131,000**	**914,000**	**783,000**	**132,000**	**1441,000**	**1,211,000**	**263,000**
Top, high, erodible	431,000	336,000	95,000	641,000	521,000	122,000	1,072,000	857,000	217,000

Table 5: The number of plans and hectares in plans completed by priority.

Plans completed, sorted by priority (30 June 2017)										
	Number of plans					**Hectares of plans x1000**				
	Region	Top	High	Low	Other	Region	Top	High	Low	Other
Plans Completed	669	187	247	197	38	500	196	198	92	16
Total farms	11,472	341	769	1,070	9,292	1,529	311	519	275	429
Percentage Completed	6	55	32	18	-	33	63	38	33	4
Plans to do	-	154	522	873	-	-	115	321	183	-

8.10. The categorisation into Top, High, Erodible and Not Priority land is one way to target efforts to improve water quality, targeting geographically is another way. The table below shows the spread of highly erodible land (as calculated by Manaaki Whenua for the region) and how it is distributed through the region's catchments. The data shows that the Whanganui Catchment has the highest amount of HEL on private land in the region with 47% of the regions total in a catchment that represents 32 percent of the regions area.

Table 6: Highly erodible land by catchment, broken down by pasture and woody vegetation cover.

Note Highly Erodible Land (HEL) in this table is from Landcare Research & includes only the aera on private land. Catchment	Catchment Area (ha)	HEL in the catchment with pasture cover (ha)	HEL in the catchment with woody vegetation cover (ha)	Total HEL in the catchment	Percentage of HEL in catchment	Percentage of HEL in the Region	Catchment area as a percentage of the overall regional area.
Akitio River	59,136	10,953	3,241	**14,193**	24%	3%	3%
East Coast	19,979	9,582	2,224	**11,806**	59%	3%	1%
Lake Horowhenua & Hokio Stream	6,963	5	1	**6**	0%	0%	0%
Manawatu	589,215	36,282	15,417	**51,699**	9%	11%	26%
Ohau River	18,878	60	961	**1,021**	5%	0%	1%
Owahanga River	42,911	9,704	3,049	**12,753**	30%	3%	2%
Rangitikei River	393,884	30,264	13,937	**44,201**	11%	10%	18%
Turakina River	95,723	26,843	9,202	**36,044**	38%	8%	4%
West Coast	86,554	3,936	8,719	**12,655**	15%	3%	4%
Whangaehu	199,369	42,093	20,151	**62,244**	31%	13%	9%
Whanganui	719,492	93,638	123,297	**216,935**	30%	47%	32%
Grand Total	**2,232,104**	**263,360**	**200,198**	**463,557**	21%	100%	100%

8.11. The table below shows how much of each catchment's highly erodible land is currently in Whole Farm Plans. This shows that 49% of the Manaaki Whenua defined Highly Erodible Land (HEL) on private land is within SLUI farm plans and that seven of the 10 catchments with significant HEL (excluding Lake Horowhenua) have over 60 % of the defined HEL within SLUI whole farm plans. The Whanganui Catchment at 28% of the HEL in farm plans is well below the other large catchments and this is an area of focus for the future programme. However it should be noted that this does not include the 22,000 ha of plans completed under the Whanganui Catchment Strategy.

Table 7: Highly Erodible Land (HEL) within and outside SLUI plans by catchment.

Note Highly Erodible Land (HEL) in this table is from Landcare Research & includes only the aera on private land. Catchment	Total amount of HEL in the catchment	Area of HEL in the catchment in SLUI Farm Plans (ha)	Area of HEL in the catchment not in a SLUI Farm Plan (ha)	Percentage of HEL in catchment in a SLUI Farm Plan	Percentage of HEL in catchment not in SLUI Farm Plan
Akitio River	14,193	9,234	4,959	65%	35%
East Coast	11,806	8,884	2,922	75%	25%
Lake Horowhenua & Hokio Stream	6	-	6	0%	100%
Manawatu	51,699	36,374	15,325	70%	30%
Ohau River	1,021	-	1,021	0%	100%
Owahanga River	12,753	7,738	5,015	61%	39%
Rangitikei River	44,201	33,055	11,145	75%	25%
Turakina River	36,044	23,400	12,644	65%	35%
West Coast	12,655	4,262	8,393	34%	66%
Whangaehu	62,244	43,390	18,854	70%	30%
Whanganui	216,935	60,419	156,516	28%	72%
Total	**463,557**	**226,757**	**236,800**	**49%**	**51%**

Modelled water quality outcomes resulting from SLUI implementation

8.12. Over the last five years, Horizons has commissioned a number of research projects aimed at both quantifying the impact SLUI has had on water quality outcome and better refining our understanding of sediment sources and sedimentation issues. This section provides a brief overview of this work and the current research to inform work programmes.

8.13. The SedNetNZ model, developed in collaboration with Manaaki Whenua, estimates sediment loads to rivers and by including spatial data from the SLUI Whole Farm Plans, can predict the effective reduction in sediment load as a result of the work. The model was developed over a number of years following the establishment of SLUI in 2006 and was calibrated using Horizons continuous suspended sediment and turbidity monitoring data. In 2014, following refinement of the model and establishment of assumptions, the first model outputs were produced. It was predicted that based on the most likely scenario (at that time) of continuing with 35 000 ha of Whole Farm Plans per year with no limit to afforestation (i.e. grants on forestry >5 ha are still provided) that there would be a 27% overall decrease in sediment loads by 2043. Later research predicted that these decreases may reduce to 19%, 12% and 5% with the impact of minor, moderate or major climate change scenarios. It is noted that this year the programme is producing approximately 20,000 ha of new whole farm plans (less than the scenario modelled).

8.14. An updated assessment factoring climate change into these scenarios in 2018, showed the programme may not offset the increases in sediment load from climate change in the longer term, as climate change is predicted to increase sediment loads in rivers by between 41 to 179% by 2090 depending on the severity of climate change. This suggests the long-term effectiveness of work already undertaken through SLUI is expected to reduce under climate change, as heavier rainfall events increase sediment loading in the region's rivers. It also means that continued investment in SLUI, or other programmes for erosion mitigation, will be required to offset the potentially severe effects of climate change.

Monitoring sediment

8.15. Monitoring of sediment (directly and indirectly) in water throughout the region occurs through the different programmes that comprise state of the environment monitoring network.

- Suspended Sediment monitoring as total suspended solids and suspended sediment concentration occurs at all of the river state of the environment and discharge monitoring sites monthly using grab samples. Sixteen of these sites have a continuous record available due to the rating curves developed between suspended sediment concentrations and the continuous turbidity measured at these sites;
- Deposited Sediment is measured at 65 periphyton sites using a bathyscope on a monthly basis and the remainder of the state of the environment network includes a bankside visual estimate of substrate;
- Particulate organic matter is monitored upstream and downstream of 26 major point source discharges across the region. Historically this was monitored across the network but continually low concentrations at the state of the environment sites has meant this measure is now only utilised for measuring direct discharges;
- Turbidity is measured at all of the state of the environment sites monthly using a grab sampling method. It is also measured at 16 of these sites on a continuous basis to allow for calculation of continuous sediment loads; and
- Visual clarity is measured at the majority of state of the environment sites monthly and is a field measurement.

8.16. For an explanation of the parameters and water quality targets associated with them see Annex 1.

Current state and trends

8.17. Land Water People (LWP) ltd assessed achievement of One Plan targets and trends (10 and 20 year) for visual clarity (distance and change) and particulate organic matter (Fraser and Snelder, 2018). The supplementary information that was provided with the report also gave trend analysis for the other sediment parameters with the exception of deposited sediment. The deposited sediment data set has not been analysed to date.

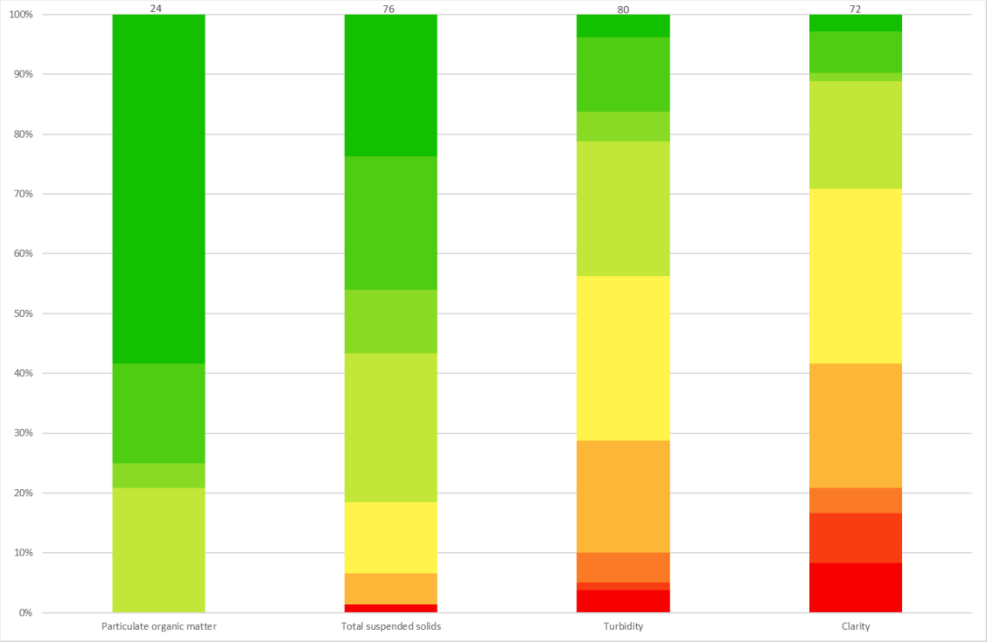
State

8.18. The analysis undertaken by LWP ltd found that at both state of the environment and impact (directly downstream of point source discharges) sites clarity targets were predominantly not being achieved but targets for particulate organic matter were being achieved. The percent reduction in clarity targets were also largely not met between upstream and downstream of the monitored point source discharges.

8.19. Additionally 5 of 40 estuaries regionally have been identified as being highly vulnerable to nutrients and sediment and a further 2 moderately vulnerable.

Trends

8.20. Over the 10 year period to July 2017 regional trends at state of the environment sites in clarity were predominantly degrading (i.e. decreasing visual clarity) whereas trends in particulate organic matter and TSS were predominantly improving (i.e. decreasing concentration of particulate organic matter and TSS). Over the 20 year period the results were mixed for clarity, turbidity and TSS, the only site with sufficient data for analysis for particulate organic matter was certain to be improving (Figure 1).



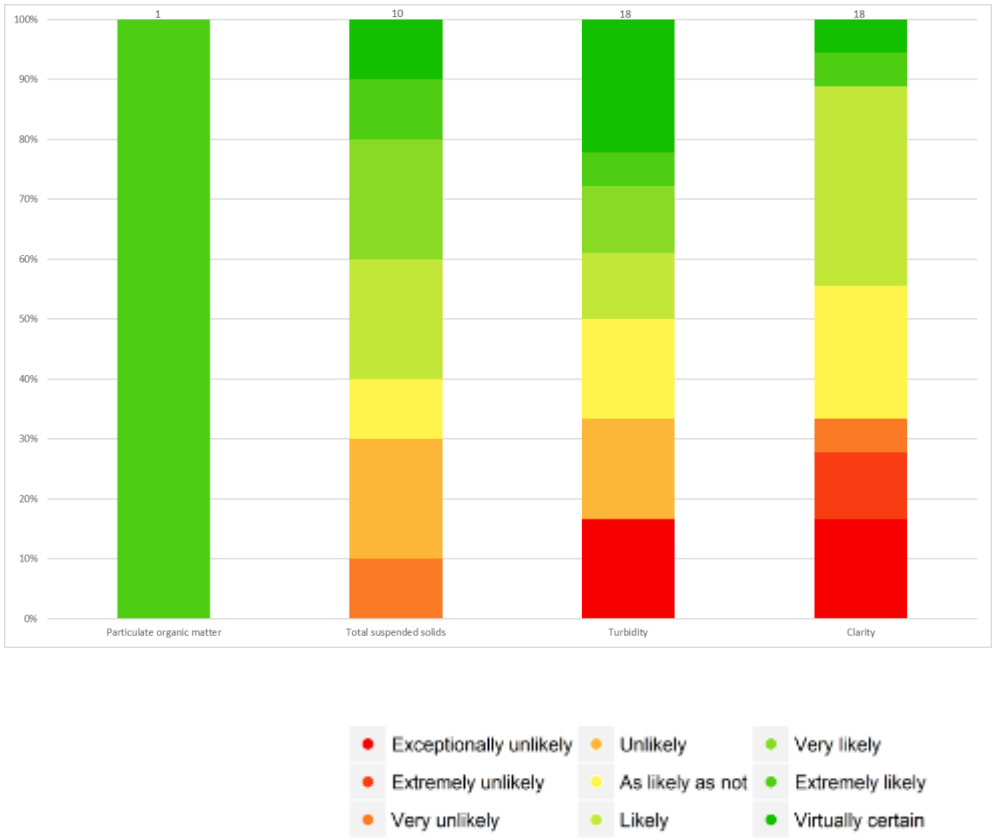
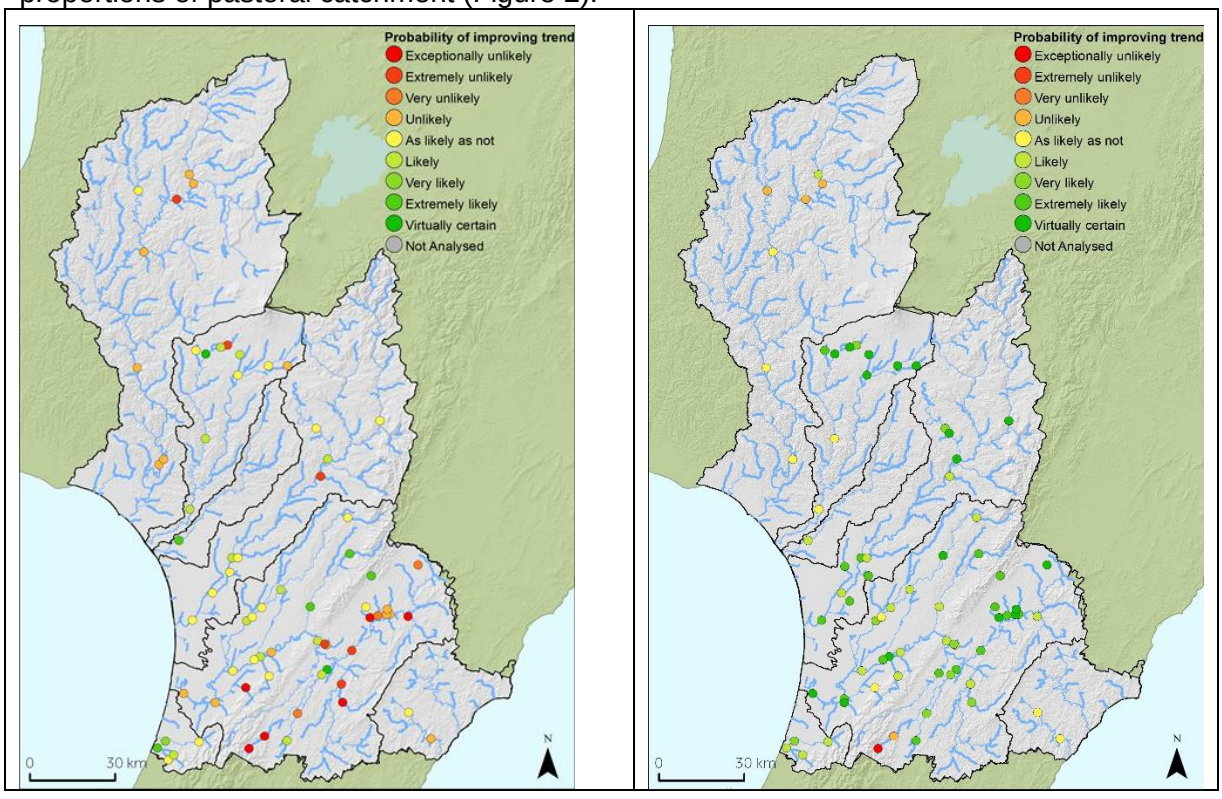
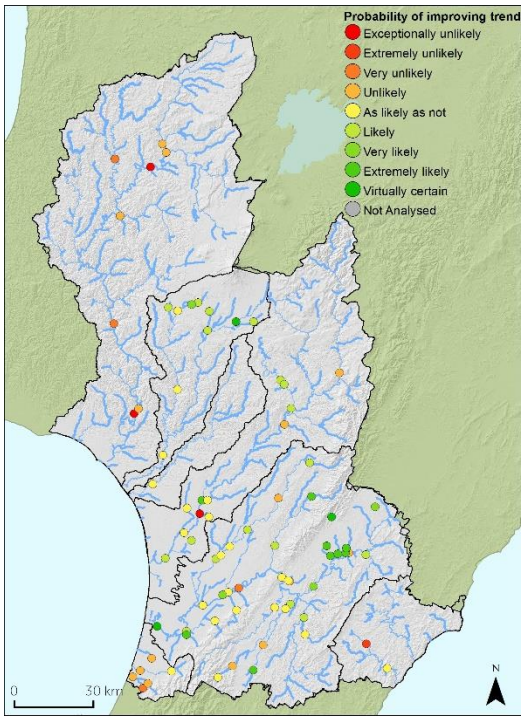


Figure 1: Proportion of SoE sites showing the likelihood of an improving unadjusted trends for the 10-year period (top graph) and 20-year period ending July 2017. The number at the top of each bar indicates the number of sites in the analysis. Green indicates improving trends whereas orange/red indicates degrading trends.

8.21. In the ten year dataset declining trends in the measured parameters have been observed at sites with large proportions of the catchment in native cover as well as sites with higher proportions of pastoral catchment (Figure 2).



Probability of improving trend in visual clarity	Probability of improving trend in TSS



Probability of improving trend in Turbidity

Figure 2: Location of SoE sites showing probability of improving unadjusted trends for the 10-year for each of the sediment parameters. . Green indicates improving trends whereas orange/red indicates degrading trends.

8.22. Earlier analysis (February 2018) conducted by LWP provided an assessment of recent reductions in on *E. coli* and three sediment related parameters (visual clarity, suspended sediment concentration and turbidity) in the Manawatū -Whanganui Region. This analysis included spatial modelling to look at the associations between interventions and water quality outcomes. The results showed weak but statistically significant associations between improving trends for all water quality variables and the proportion of catchment involved in SLUI farm plans. There were also significant associations between improving water quality and additional HRC initiatives associated with riparian planting and new fencing.

8.23. Spatial modelling of state and trends across the dataset utilised in the later LWP analysis for all water quality variables is currently being undertaken in a similar manner to that of the earlier report for *E. coli* and sediment. This analysis is investigating the associations between interventions, climate and land use change with state and trends of river water quality across the region and is expected to be delivered later in the calendar year.

Fluvial research

8.24. Over time Horizons has surveyed rivers that inform management of flood control schemes and gravel management. Internally within Horizons the survey programme is coordinated between the Science, River Management and Survey Teams. In the past, fluvial surveys were carried out on the wetted channel of the river only. Through advances in our equipment, they are now able to extend from stopbank to stopbank, providing a better overall picture of sedimentation and gravel resources in our rivers. Council has increased its investment in fluvial science over time, in particular to research the issue of sedimentation impacts on levels of service for flood protection. The Science and River Management Teams have collaborated with scientists from Manaaki Whenua and Massey University to complete this research and some of these studies are shown below.

Oroua catchment sediment fingerprinting case study

8.25. The Oroua River is a priority catchment for SLUI works reflecting the issue of sedimentation on the Lower Oroua and impacts on flood protection. To further understand sources of sediment in the catchment, Horizons commissioned a project to Manaaki Whenua in 2017 to undertake sediment fingerprinting in the Oroua Catchment. Sediment fingerprinting techniques involve taking samples from both 'source' and 'sink' sites within a catchment and evaluate particle size, mineralogy and geochemical properties to characterise the sample and trace the in-channel deposited sediment ('sinks') to their likely sources.

8.26. The results determined that the dominant sediment sources contributing of overbank sediment deposition were hill subsurface (31-37 %) and unconsolidated sediment sources (26-27 %). The remaining proportions comprise Mudstone (9–10 %), Mountain Range (9–15%), and Hill Surface (7–8%) sediment sources, with a possible Channel Bank sediment contribution of up to 18%. Sediment fingerprinting has been applied elsewhere on the region outside of this study. Dr Simon Vale (Manaaki Whenua) will discuss this further during the Committee meeting.

8.27. The figure below demonstrates the total specific yield derived from sediment fingerprinting proportions distributed across spatial extent of source material.

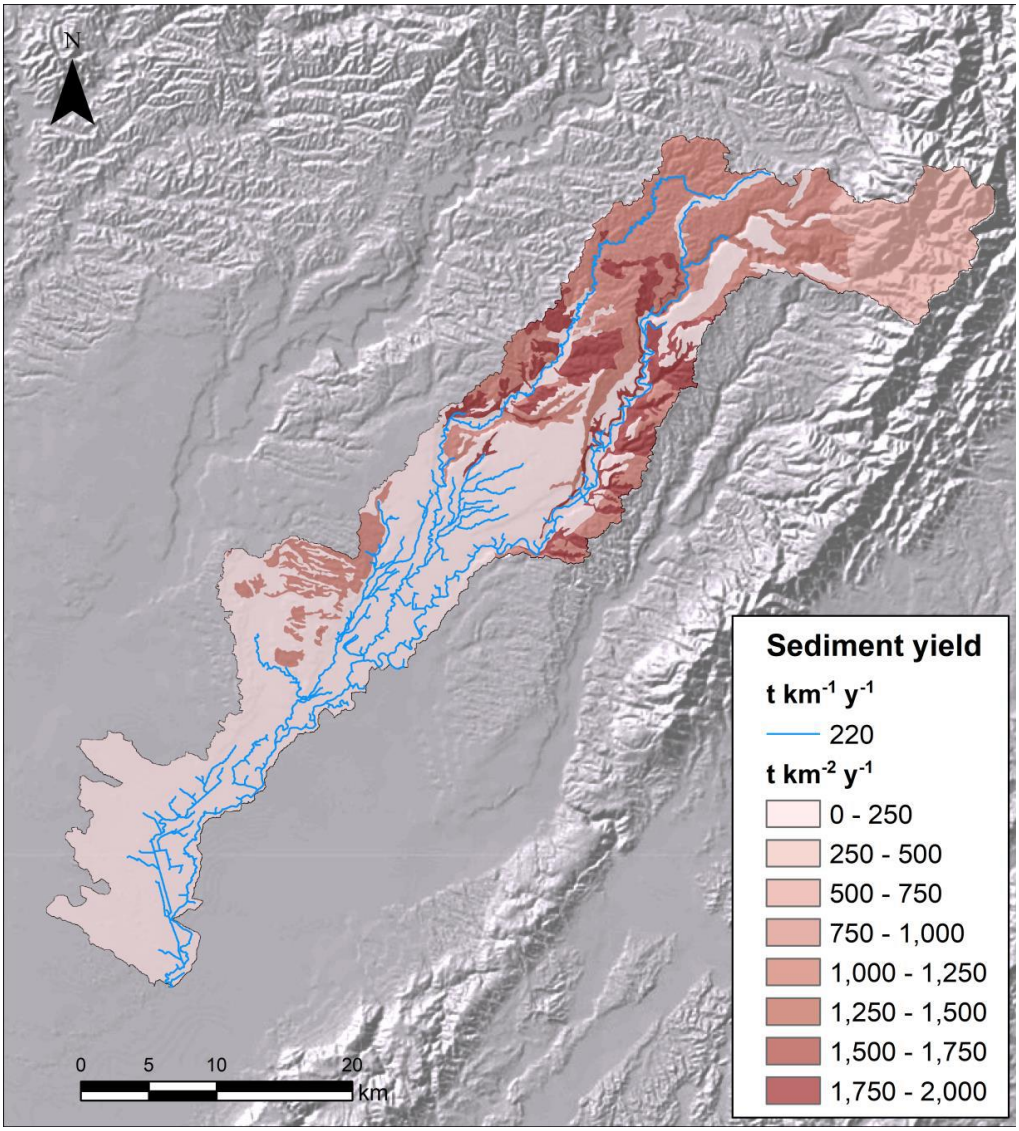


Figure 3: Sediment yield based on sediment fingerprinting to identify key source areas.

Technological advances in fluvial science

8.28. A new technique for establishing changes in channel erosion and sediment deposition over time is being exposed through the use of aerial LiDAR (Light Detection and Ranging). In 2018, a comparison between LiDAR derived Digital Elevation Models of the Oroua River taken in 2006 and 2016 was carried out to assess volume change over the ten year period and where along the river aggradation and degradation were occurring. This work was completed by Prof Ian Fuller and Robert Dykes at Massey University and demonstrated that net deposition was recorded in the upper reaches and erosion dominated the lower reaches. In 2017/18 the first full cross section survey of the Manawatū River from the Manawatu Gorge to the Sea was completed and LiDAR was flown over this area.

8.29. Horizons has a current project underway working with Tonkin & Taylor on a sedimentation study in the Lower Manawatū which will take into account the previous work completed in the Oroua, as well as cross-section information and LiDAR flown in the Lower Manawatū.

Current research

8.30. Manaaki Whenua, through support of Horizons Regional Council and other stakeholders have secured MBIE funding for a five year project titled, “Smarter targeting of erosion control”. The aim of this project is to develop models and tools that will improve our understanding of the links between erosion sources and sediment related water quality, determine the performance of erosion control measures and develop a framework for national scale assessment of erosion sediment redistribution and economic impacts.

8.31. Key streams of this research include developing a model at the storm event scale (from SedNetNZ using average annual loads in the past), characterization of sediment quality linking erosion source to sediment quality and improving erosion modelling. The Manawatū and Whanganui rivers are two catchments that will be studied in this project. Horizons are partnering with Manaaki Whenua with this research by providing data and knowledge of the study areas. John Dymond (Manaaki Whenua) will discuss this in more detail at the Committee meeting.

8.32. Understanding of channel bank erosion has in the past been limited and required assumptions in the SedNetNZ model. A recent paper published by Manaaki Whenua (Smith et al, 2019) presented a new spatial model of bank erosion. This was calibrated and tested using spatial data in the Manawatū Catchment and the revised model predicts that bank erosion contributes more sediment to the overall sediment load than the previous model.

8.33. Horizons continue to work alongside other organisations across water quality and erosion and fluvial research to develop our understanding of sediment processes and linking erosion prevention to water quality outcomes. Spatial modelling of state and trends, the Lower Manawatu sedimentation study and the Smarter Targeting of Erosion Control programme are ongoing and will be reported on further to Council in due course.

9. SIGNIFICANCE

9.1. This is not a significant decision according to the Council’s Policy on Significance and Engagement.

Staci Boyte
SCIENTIST – LAND

Maree Patterson
SENIOR WATER QUALITY SCIENTIST

Grant Cooper
LAND AND PARTNERSHIPS MANAGER

Jon Roygard
GROUP MANAGER NATURAL RESOURCES & PARTNERSHIPS

ANNEXES

A Water Quality Monitoring

Type of sediment measure	Measured by	Measured for	Water Quality Standard/Target
Suspended Sediment	Total suspended solids (TSS). Total suspended solids is measured in the laboratory by subsampling (a small volume of water is taken from a mixed sample) and filtering the water. The weight of the filter is measured to give a concentration. This measurement can be biased towards the finer sediment as larger particles are difficult to resuspend in a sample and may be missed by sub sampling.	Traditionally TSS was utilised as the measure by which sediment load was derived. Following a review in 2012 of the continuous sediment network both TSS and SSC have been measured.	None
	Suspended sediment concentration (SSC). The same as for TSS except the entire bottle of water is passed through the filter meaning all sediment is captured.	This measure is better suited for total sediment loads as larger particles are included in the result. This was added to the programme following the review by NIWA in 2012.	None
	Particulate Organic Matter. This is the organic fraction of the TSS measure. The filter paper from the TSS sample is burnt at a set temperature and then re weighed the difference between the two weights is the organic component	The organic component of sediment is the fraction that consumes oxygen as it is broken down.	One Plan has targets for POM relating to the life supporting capacity values of the water body.

Deposited sediment	Substrate composition: Visual estimate via bathyscope at periphyton sites Bankside visual estimate at SOE sites	Understanding the movement and deposition of sediment through the catchment and effects of life supporting capacity through the fine sediment classification	One plan targets for Depositied fine sediment linked to Life Supporting capacity outcomes.
Turbidity	Measured continuously at 16 sites and via grab samples and laboratory analysis at all State of the Environment sites.	Measures the scattering of light caused by fine particles in our waterways caused by heavy rainfall, disturbance of the riverbed or bank by heavy machinery or through direct discharges. Turbidity is a surrogate measurement for suspended sediment and/or visual clarity. A rating curve (or series of) for each site between Turbidity and SSC/TSS is utilised to generate a continuous sediment load at 16 sites across the region. The continuous sites records are often used by Trout Fishers to determine where to fish.	None

Clarity	Measured in metres by assessing the horizontal visibility through water of a black disc. The black disc is moved away from the viewer until it is no longer visible, the distance between the viewer and disc is measured. A high black disc measurement indicates good water clarity.	Reduction of visual clarity has considerable effects on human perception of recreational waterbodies and their fishability. A significant change in water clarity may also alter sunlight penetration and be associated with sediment deposition on the riverbed, in turn affecting ecosystem processes and communities	One Plan target linked to the Visual aesthetic component of water quality as well as safety whilst swimming. A clarity change target is also in the One Plan to provide for aesthetic and recreational values.

Report No.	19-94
Decision Required	

SUSTAINABLE LAND USE INITIATIVE FUNDING

1. PURPOSE

1.1. The purpose of this item is to update Committee members on changes to the **Sustainable Land Use Initiative** (SLUI) funding over the next four financial years as a result of the **Hill Country Erosion Fund** (HCEF) application and subsequent contract negotiations. The report also overviews some changes to the SLUI programme as a part of the new HCEF contract and in response to increasing interest in afforestation in the region

2. EXECUTIVE SUMMARY

2.1. Horizons successfully applied for a fourth round of funding through the Hill Country Erosion Fund in 2018 and achieved and overall increase in budget from Central Government of approximately 55%.

2.2. While there was an increase in funding, the approved funding was less than applied for and had a range of constraints on work types. An additional complication was the separate announcement of tree planting grants through the One Billion Trees programme with new grants available for some work types directly from Central Government, in some cases at better grant rates than in the HCEF application. This paper overviews the outcomes of negotiations with MPI to finalise an agreed four year contract for SLUI through the Hill Country Erosion Fund.

2.3. The paper also overviews changes to SLUI as a part of the new contract including the ability to fund works on a greater amount of priority land through extending SLUI grants to works within farm and paddock maps, not just Whole Farm Plans. Further the SLUI funds will be able to be applied to farms with Whanganui Catchment Strategy farm plans.

2.4. Growing interest in afforestation, especially through pines and Mānuka has led to a large increase in funding applications for winter 2019 planting. In order to manage these applications changes to the afforestation grants have been proposed including diverting some applications through to the One Billion Trees fund and limiting the amount of funding to farms that are converting more than 50% of a farm to forestry and capping the contributions to forestry on a farm to 150 ha/year per farm. Further detail on these proposed grant funding changes are provided in the paper.

3. RECOMMENDATION

That the Committee recommends that Council:

a. receives the information contained in Report No. 19-94.

b. endorses the approach of providing Sustainable Land Use Initiative assistance (mapping and funding) to farms with Sustainable Land Use Initiative Whole Farm Plans, Sustainable Land Use Initiative Whole Farm Maps, Sustainable Land Use Initiative Paddock Maps, and Whanganui Catchment Strategy Plans.

c. endorses changes to the Sustainable Land Use Initiative programme as a result of the new Hill Country Erosion Fund funding contract as outlined in paragraph 7.5 and 8.21,

d. endorses the changes to Sustainable Land Use Initiative grant funding as outlined below:

   i. encourage and support landowners to seek funding support for hill country erosion works through the 1 billion trees programme;

   ii. for radiata afforestation grants remaining within SLUI apply the approach in paragraph 8.12.

4. FINANCIAL IMPACT

4.1. The changes to funding noted in this report will be accommodated within the Annual Plan and **Long-term Plan** (LTP) budgets as agreed by Council.

4.2. The funding to be allocated to Horizons following the application process was less than the applied amount. Specific work areas where grant assistance will be allocated had funding cut. This has led to works programmes being modified in some areas.

5. COMMUNITY ENGAGEMENT

5.1. Consultation was carried out through the 2012-22 LTP submission process and the recent Annual Plan process.

5.2. The **Ministry of Primary Industries** (MPI) has a key role in part funding and overseeing this activity.

5.3. The SLUI Advisory Group is updated approximately every six months about progress with this programme and receives copies of these agenda items. The group last met on 25 September. The next meeting is planned for June 11.

6. SIGNIFICANT BUSINESS RISK IMPACT

6.1. There are no significant risks inherent in the adoption of recommendations contained in this report.

7. BACKGROUND

7.1. Three HCEF contracts have been undertaken through contracts between MPI and Horizons beginning in 2007. The 30th June 2019 marks the completion of the third contract, with total funding over that time from MPI exceeding $18.1 million and Horizons $36.5 million.

7.2. Funding for the current financial year has a MPI commitment of $1.089 million and Horizons $3.756 million (plus reserves if necessary). This year had boosted funding from other sources such as Supplementary SLUI and Primary Growth Fund, not included in this report.

7.3. A new HCEF funding application was made in October 2018, with the success of the application notified to Horizons in December. The new bid proposed some changes in the way that SLUI would be delivered. A significant change in order to speed up targeting of Top and High priority land was to enable grant funding to be allocated to a wider variety of plan types beyond just whole farm plans. The new application proposed being able to fund works where SLUI whole farm maps or SLUI paddock map had been completed and works on Whanganui Catchment Strategy Plans. The new tools for farm and paddock maps provide for works to occur where a farmer does not want a full farm plan, or is waiting for one to be completed. The ability to fund on Whanganui Catchment Strategy farms removes a financial constraint that was in place for the amount of works that were possible on these farms and makes approximately 22,000 ha more farm plans open to works as a part of the SLUI programme. This approach also provides for more farmers across the region to be able to participate in the SLUI programme and addresses an issue of different grant rates being used in the Whanganui Catchment Strategy programme and SLUI programme. Horizons is continuing discussion with the Whanganui River Enhancement Trust around these changes and how to ensure their valued efforts and input continues to be recognised.

7.4. The new bid also required more emphasis to be applied to assisting landowners make decisions around afforestation through forestry appraisals, and an increase in the monitoring of works already completed to ensure the integrity of the outcomes being reported.

7.5. Council were updated on the funding results and proposals for reworking the funding allocation at a Workshop on 19 March 2019. In that workshop the following points were discussed:

- The new application achieved Total funding of $6.493 million over four years and this was less than the $8.35 million applied for;
- This was a 55% increase in MPI funding per annum overall;
- Grants programmes change over years and vary by work types (as discussed further below). For example the funding approved was uneven over years ($1.737, $1.388, $1.670, $1.701 million);
- Funding for staff capacity and other non-grant components of the programme budgets were approved as applied for, increasing the non-grant related expenditure by around $360,000 per year, and

7.6. The “non grants” component of the programme primarily relates to staff capacity and also includes funding for things like advertising, independent forestry appraisals, production of farm plans etc. The increased budget for this allowed for extra contract costs for farms mapping as well as additional staff time. This additional staff capacity has provided for the recent appointment of a new position in the team, a Land Management Advisor – Forestry, and a one year contract for support to improve reporting and auditing within the programme, in part in response to new requirements of the new contract. The Land Manager Advisor Forestry position is aimed at increasing capacity to ensure the forestry that the programme is supporting is being done to best practice and to contribute to the logistics of getting the plantings established successfully.

7.7. The grants programme funding that was announced was lower than that applied for and had considerable shifts within the years for the types of works supported and the amounts of funding for these. For example no MPI contribution to afforestation in year 1, but contributions to this in years 2, 3 and 4 and some MPI funding for stream fencing and planting (riparian planting) in year 1, however no funding for this in subsequent years.

7.8. The grant funding component of the budget was further complicated by the uncertainty around how to integrate HCEF funding announced in October with the One Billion Trees funding programme announced in November and the demand for forestry that had been

signalled in the region for planting in winter of 2019. The details of the funding announcement for the HCEF funding were made available to Horizons in January and the criteria and funding arrangements for the One Billion Trees programme confirmed in February.

7.9. Subsequent discussions with Ministry for Primary Industries, and now **Te Uru Rākau** (TUR) have led to a reworking of the grant works programme and the annual work targets. No changes have been made to the agreed labour, staff and contract time necessary to support the work programme as this was considered as a priority by TUR. Following the workshop with Council in March, staff have worked to finalise a contract for the HCEF programme and this is expected to be signed in early June.

8. DISCUSSION

8.1. A key part of this item is to update council on the final changes to the grant funding in the HCEF contract and the implications of these for the programme with the current level of demand. The sections below outline the changes to the grant funding from what was applied for to what is to be contracted and also to relate that to the current level of demand.

8.2. Changes to the four year HCEF funding from what was applied for to what was approved in January by TUR were all in the grant part of the application and resulted in;

- $287 k less for afforestation, and $0 from MPI in year one
- $491 k less for riparian retirement, with no decrease in year 1
- $1,078 k less for retirement and reversion, with no decrease in year 1.

Table 1: Comparison of current grant budgets and targets to changes under new application (HCEF/Horizons)

Work Type	Current Year		Applied HCEF yr 1		Approved TUR yr 1		Contracted yr 1 *2	
	ha	$ x1000	ha	$ x1000	ha	$ x1000	ha	$ x1000
Afforestation	1,150	747	930	700	-	434	1,460	1,097
Reversion/Ret	450	199	850	427	-	427	940	426
Riparian	500	750	500	1111	-	1111	220	358
Space/other	900	375	850	340	-	340	820	463
Total	**3,000**	**2,071**	**3,130**	**2,578**	*1	**2,312**	**3,440**	**2,344**

***1 – Approvals came back allowing Horizons to renegotiate the targets so no targets at that stage**

***2 – proposed and ready for contract signing**

8.3. The HCEF and One Billion Trees overlap and conflict to some extent, so it has been necessary to try and understand the impacts of all the funding schemes before finally developing the HCEF to a contract stage. For example the SLUI application proposed completing 400 ha per year of reversion at $1000/ha of grant funding, however the One Billion Trees programme subsequently announced that reversion could be funded at $1,500/ha. A further example is that the SLUI application proposed funding Mānuka establishment under afforestation at 50-70% grant rate to a max cost of $2,000/ha, a grant of $1,000 - $1,400/ha, One Billion Trees announced Mānuka grant of $1,800 - $2,300/ha.

8.4. During the current financial year Horizons have been responding to signals for more afforestation, we picked up the Primary Growth Fund project which has included expressions of interest for winter 2019 planting along with forestry appraisals to help landowners understand cost and benefits of planting.

Allocation of Work and Budget

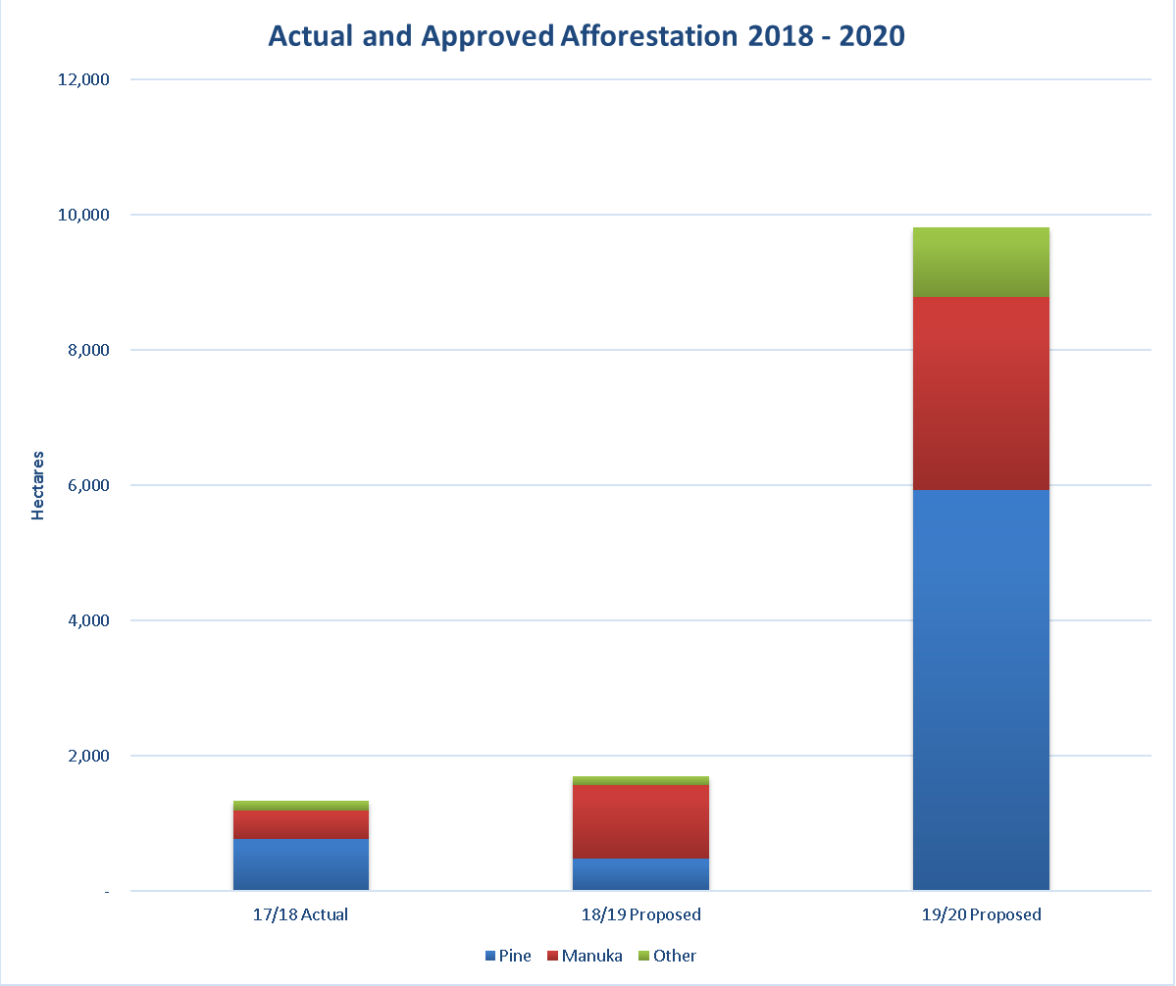
8.5. Over the last year work within SLUI including the additional funding from the provincial growth fund for forestry in the region and the SLUI boost funding has generated additional interest in afforestation. This was assisted by a range of work including field days, presentations to farming groups, one on one meetings, the forestry appraisals and the expressions of interest process. Programmes like the One Billion Trees programme and increased knowledge of the potential returns from carbon forestry have also continued to grow interest in new afforestation.

8.6. The increased interest in tree planting has resulted in a large number of applications to the SLUI programme for afforestation. This winter there are 55 afforestation jobs on our books totalling 9,930 ha (the bulk of these are for pines 30 jobs and 5,927 ha, and Mānuka 15 jobs and 2,856 ha), with a smaller number of "other species". The level of increase is shown in Graph 1 below that shows the amount of forestry that grants were provided for in 2017/18 (1342 ha) and that proposed in 2018/19 (1700 ha).

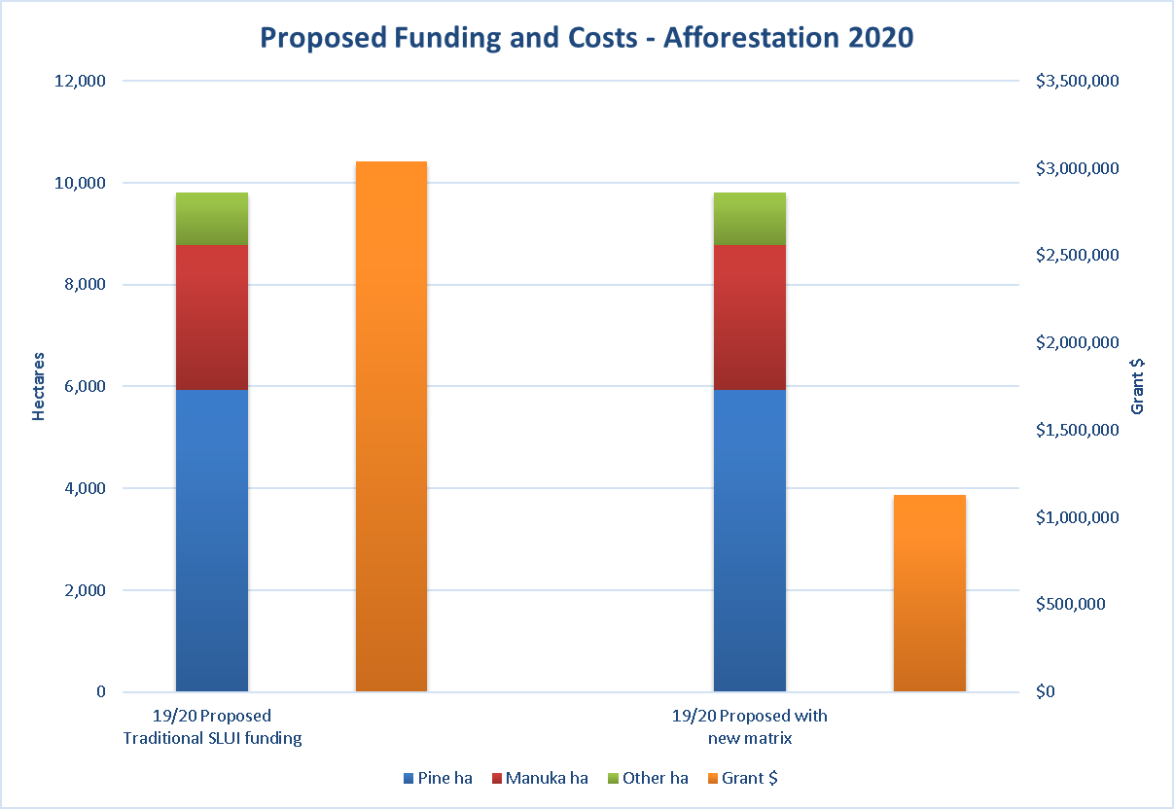
8.7. The challenge with this increase in forestry applications is the ability to fund the grant requests. This task has been made more difficult with the absence of any grant funding for forestry from MPI in year 1 of the new contract.

8.8. At face value a potential solution is to divert the support for this planting to the One Billion Trees programme and this is the recommended approach for the Mānuka planting and alternative species. There are some key differences between Horizons co-funding and that of the One Billion Trees programme. A primary difference is that the criteria for One Billion Trees fund limits landowners ability to obtain the carbon accrued in radiata forests, with new forests not eligible to enter the Emissions Trading Scheme until year six. For this reason landowners are seeking funding from SLUI rather than One Billion Trees for radiata establishment. A further complication is that many of forestry proposals for the year have been generated over a considerable time period, with assistance and planning support from Horizons based on the signal of increased funding availability from HCEF and One Billion Trees, however the unavailability of HCEF funding for forestry in year one and constraints on carbon for the One Billion Trees programme were unknown.

8.9. We are trying to support applications to SLUI for radiata whilst directing other planting to One Billion Trees. If we were to fund all radiata applications at an average grant of 50% the potential cost to SLUI this winter would be over $3 million, well above the $1.1 million set aside for afforestation. An approach to reduce the amount of grant funding has been developed and Graph 2 shows the impact of this proposed approach which includes setting an afforestation cap on radiata (see below) and diverting Mānuka and other species plantings to One Billion Trees. This approach requires approximately $1.150 million of grant funding. This alternate model that is described further below relies on a small amount of use of SLUI reserves and provides some contribution to the pine plantings for 2019. The approach to next years funding for pine forestry will need to be reconsidered at a later date. An essential component of the new proposed approach has been managing expectations of grant funding and staff have worked to ensure landowners are well aware of levels of grant funding for plantings this year in advance of planting.



Graph 1: Changes in interest in afforestation projects



Graph 2: Predicted afforestation grant amounts under the traditional model of SLUI funding and as predicted with the revised proposed approach to funding.

8.10. Changes to the grant programme are proposed which will manage the lumpy funding from HCEF, and allow us to remain within the overall SLUI budget.

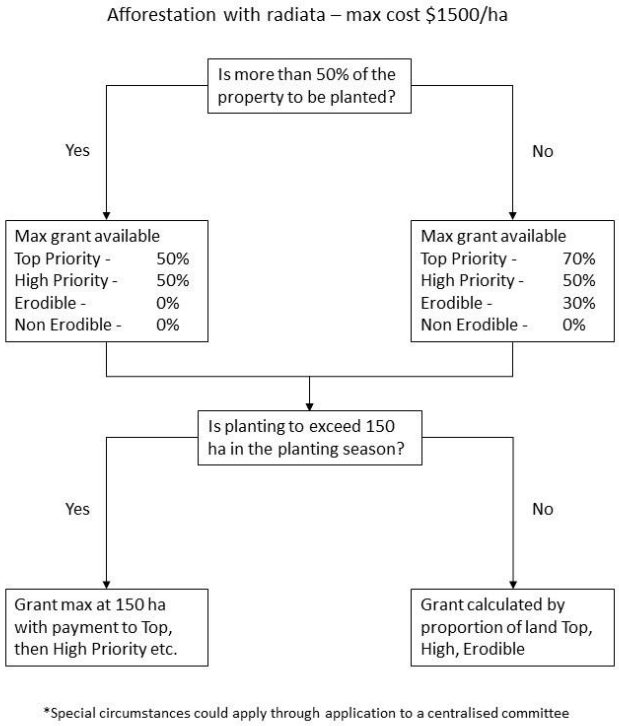
Afforestation Grants

8.11. Of the increase in radiata planting noted in 8.6, a number of these projects are for full farm conversion from pastoral to forestry and five such farms would account for 538 ha of Top Priority land and 594 ha of High priority land, accounting for approximately $1.150 million of grant funding.

8.12. In order to limit the grant funding and support more targeted grant funding a number of changes to the afforestation grant process are proposed. These are overviewed in the flow chart below and described in the text below:

- Cap the total cost of afforestation at $1,500 per ha. This is sufficient to fund most jobs planted at 1,000 – 1,200 sph (i.e. current forest practice);
- Limit funding on farms where more than 50% of the farm is being converted from pasture to radiata, and where this is the case target the grant to Top (50% grant) and High (50% grant) priority land only;
- Where less than 50% of the farm is being converted target funding to Top (70% grant), High (50% grant) and Erodible (30% grant) land;
- In either case the maximum funded in any one year is 150 ha per farm;
- Special circumstances could apply, but these are considered on a case by case basis through a centralised committee approval chaired by the Group Manager Natural Resources and Partnerships and within funding and delegation constraints;
- In all cases if SLUI money has already been spent on the site (fence or poles etc.), the grant paid for that work will be deducted from the grant.

Flow Chart: afforestation grant process for SLUI year 1



8.13. Effectively this system enables us to manage our current funding near to budget. At this stage a small reserve use would be likely but there is a contingency in that all budgeted work to date is at cap of $1,500 per ha. Many jobs will come in below this figure with a saving in grant cost.

8.14. This allows forestry to be supported to a farm and land priority scale whilst limiting support to large scale forestry. Grant rates stay true to target on Top, High and Erodible land and grant rates can be managed. The 50% of farm limit is an important signal to limit our involvement in whole farm conversions, it provides incentives for small scale forestry as a part of a working farm.

8.15. The approach provides for Horizons to maintain an involvement in large scale works, to support best practice such as; right tree right place, riparian set-backs, biodiversity considerations and non-planted areas. This has proved beneficial in discussions with landowners to date.

8.16. The new grant model encourages on farm afforestation by targeting the grant rates with 70% for Top land and maintaining a grant rate for erodible land (30%), noting that erodible land still supplies sediment to waterways, afforestation is actually more effective than space planting, and the grant rate being applied is similar to that of space planting. With the grant for erodible land being limited to farm scale planting this still allows the worst land on a farm to be planted or better land within poor paddocks to have grant assistance.

Risks to afforestation proposed afforestation grants

8.17. Risks to the approach include potential for "gaming" of the 150 ha cap or the 50% of a farm by planting over consecutive years. The 50% rate is considered the most important as it is signaling "farm conversion", we would monitor this and subsequent plantings would be ineligible.

8.18. There is a risk that those involved in larger scale forestry (> 150ha) were expecting higher levels of grant and could choose not to go ahead. This would mean less Top and High priority land gets treated in our region.

8.19. Landowners chose to move to One Billion Trees, this would result in less SLUI funding spend, difficulty in meeting SLUI targets, but overall the work would still get done.

8.20. This funding level is budgeted assuming all Mānuka and exotic afforestation will be picked up through One Billion Trees. Landowners may prefer to work with Horizons, even with lower grants, or One Billion Trees may turn down applications to land that Horizons would support. Timeframes for approvals by the One Billion Trees programme, the more involved application process and split payment of grants over time have been quoted by some landowners who have stated that they would prefer to see work co funded by the SLUI programme rather than the One Billion Trees programme.

Reversion, Retirement and Riparian Grants

8.21. As noted in 8.2, and table one, there are changes by year and by work type to the riparian and retirement grants against the HCEF application. The proposals to accommodate these changes are:

- The HCEF application included funding for reversion at $1000/ha, with application for $1.9 million over four years (roughly $570,000 TUR and $1,330,000 Horizons). The One Billion Trees has a reversion criteria of $1,500/ha. SLUI will direct most reversion applications to One Billion Trees and savings will be allocated to other job types.
- Riparian fencing is not funded after year one as HCEF believe this work to have lesser sediment outcomes. This has been a large proportion of the SLUI programme as fencing on hill country includes land retirement. If not funded at all SLUI would struggle to meet current targets. Horizons believes riparian fencing has good sediment benefits to water quality as well as reducing other contaminants to water.
- The proposed response put to and agreed by TUR will split riparian fencing into flat land "riparian" supported as "Horizons alone" funding in much the same way as in the current HCEF contract afforestation over 5 ha is Horizons funded, and a riparian retirement category, where the land is in hill country with erodible or worse land with direct links to a waterway, to be joint funded.
- This proposal would see horizons fund around $1.4 million of streambank retirement (approx. 160 km and 900 ha of work over the next four years), while the hill country retirement work component would increase by around $250,000 per year (approx. 110 km and 2,000 ha of work over the next four years).

Space Planting Grants

8.22. Space planting and other small scale works remain funded as applied for, with an increase of poles over the four years from 28,000 to nearly 40,000 poles per year. There is a small budget for "Horizons Only" funding of management of Old Man Poplars and pruning of new poles, funding is limited to $60,000 per year.

9. SUMMARY

9.1. The non grant portion of the HCEF application was approved as applied, this will support extra staff time to map and deliver SLUI to more landowners whilst retaining mapping and data integrity.

9.2. There is a need to make changes to afforestation expenditure to limit the funding available (demand exceeds funding), and to ensure grants are targeted to priority land.

9.3. The approval received from TUR has resulted in staff having to adjust funding between years and between work types, as well as redirecting some works to One Billion Trees, staff will change the way they fund riparian and retirement work types.

10. SIGNIFICANCE

10.1. This is not a significant decision according to the Council's Policy on Significance and Engagement.

Grant Cooper
MANAGER LAND & PARTNERSHIPS

Jon Roygard
GROUP MANAGER NATURAL RESOURCES & PARTNERSHIPS

ANNEXES

There are no attachments for this report.