

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 develop 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 its 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 its 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 position 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 Manawātū 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 its 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

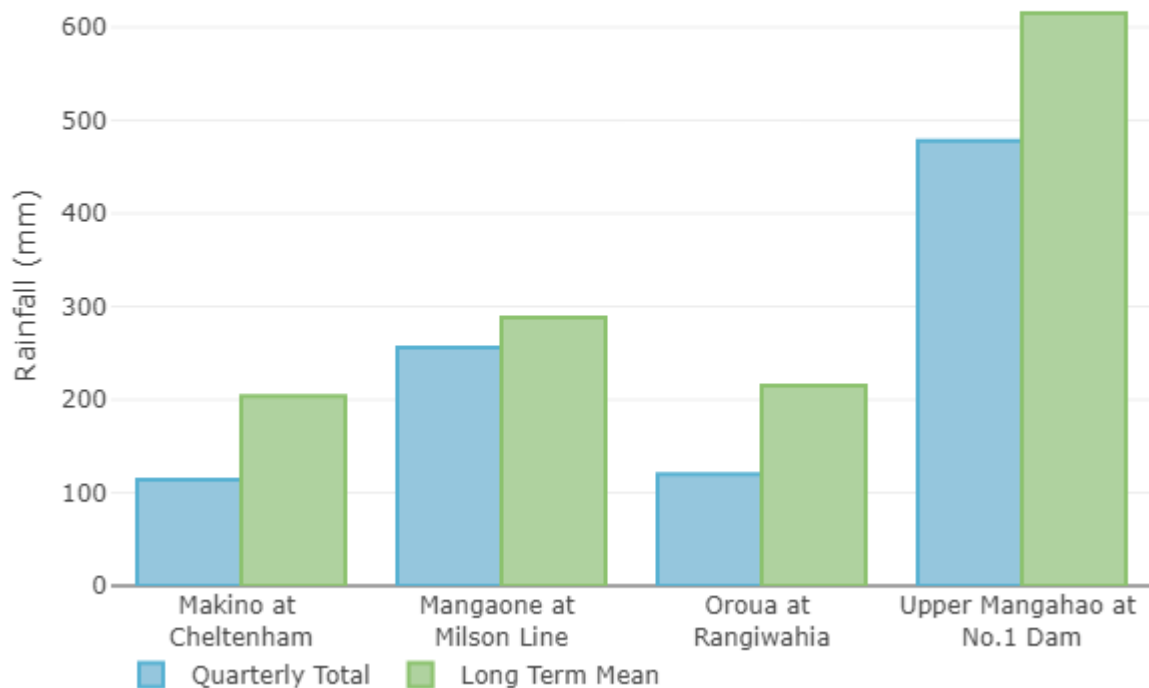
6.17. In regard to progress made on the Rural Upgrade Project – a summary of 2018 and what 2020 holds is presented as a separate item.

7. CENTRAL AREA

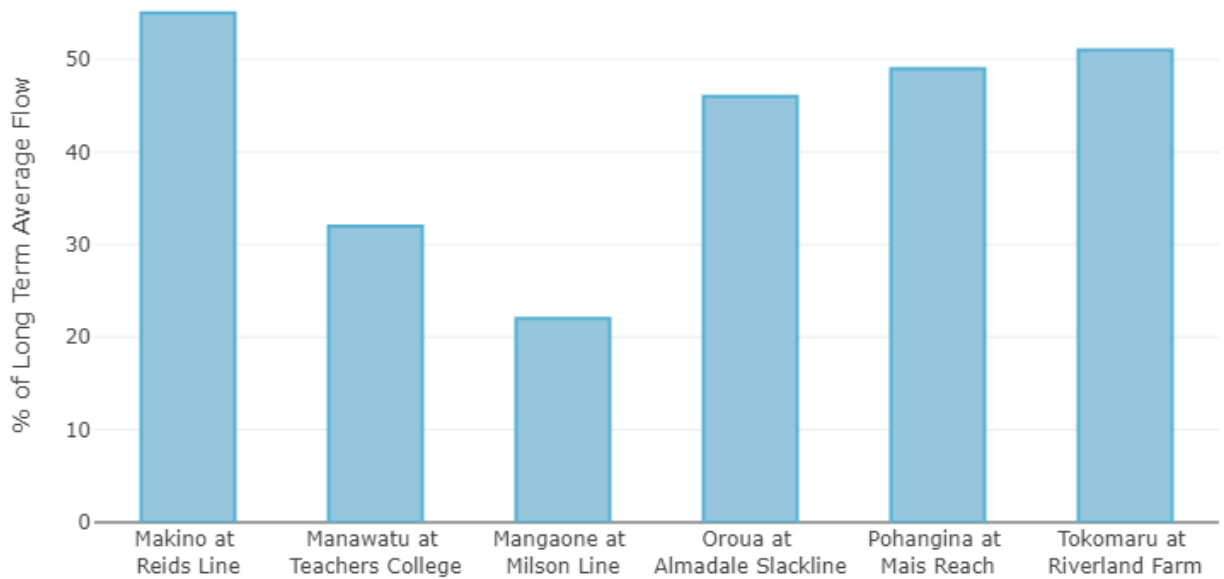
GENERAL

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.

Central Area Rainfall



Central Area
Percent of Long Term Average Flow



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 Flyers 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 Flyers 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.

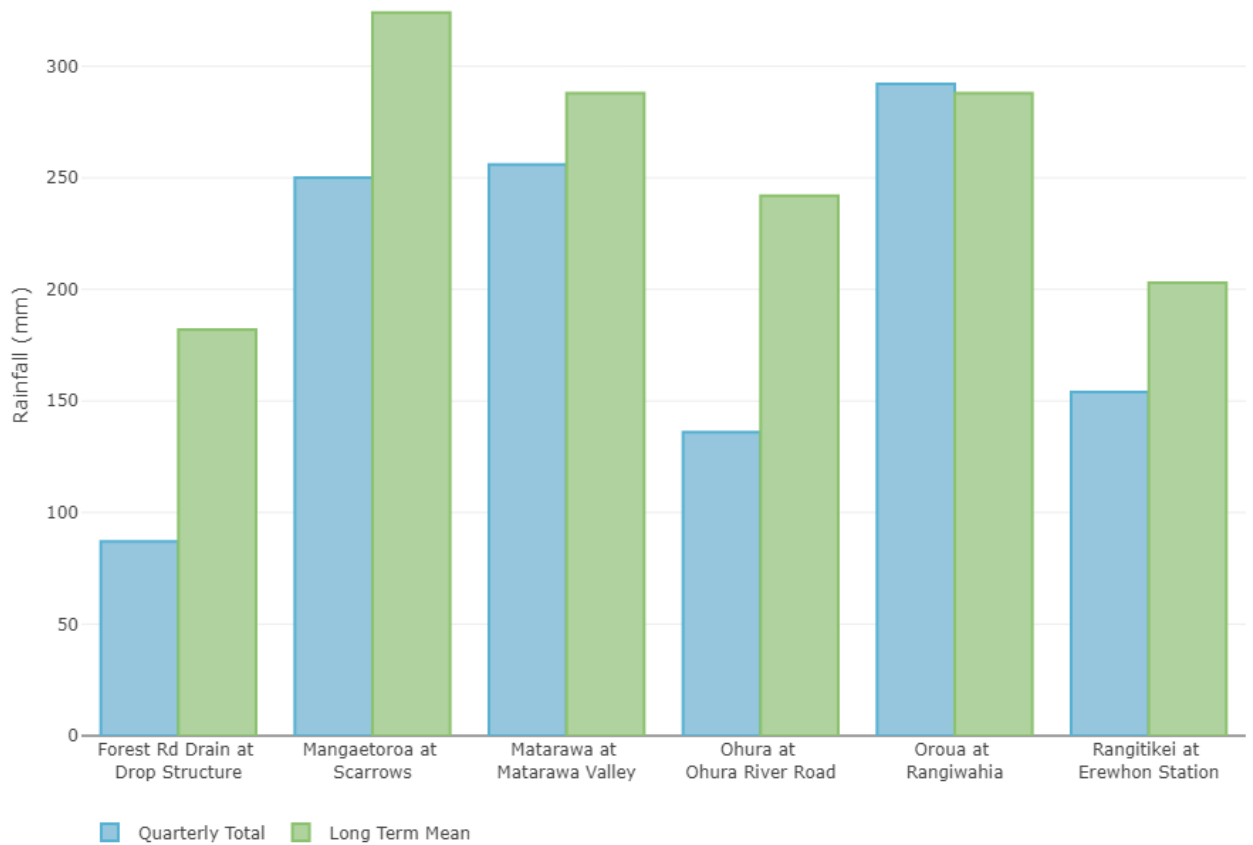
8. NORTHERN AREA

GENERAL

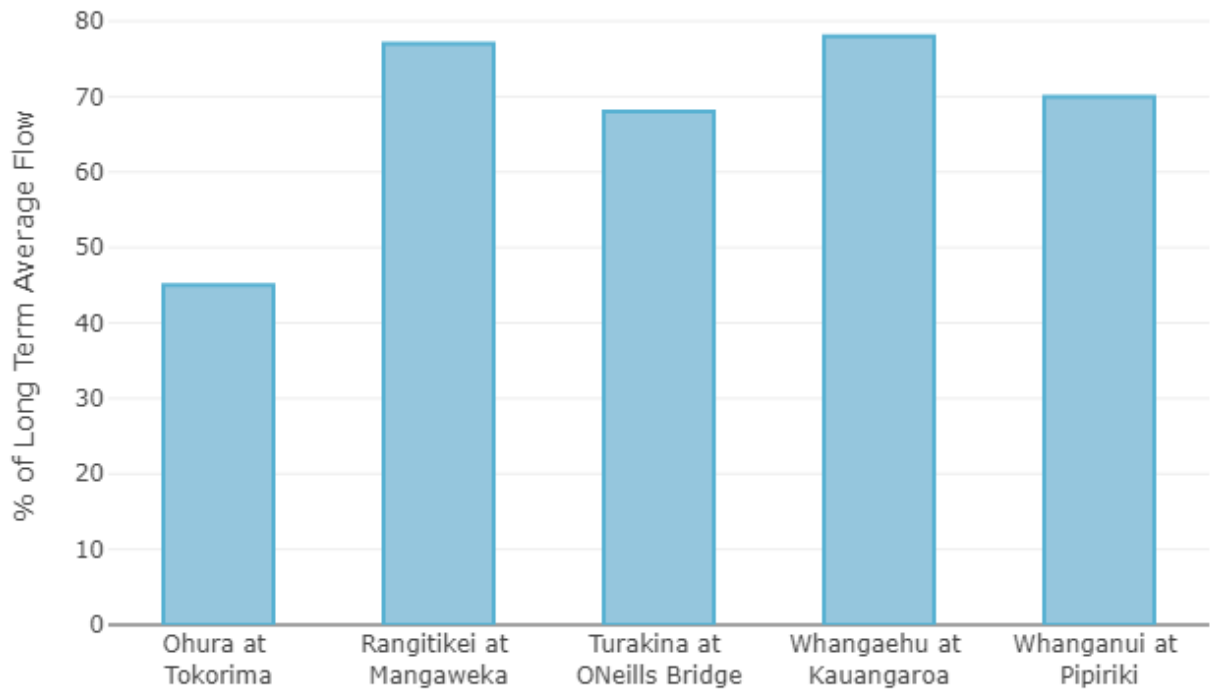
- 8.1. The very dry and warm autumn weather conditions and low river levels have allowed staff to complete almost all of their planned work for the year. Flood damage repairs from last winter are now largely complete with only a few sites are still being worked on in the Pohangina-Oroua Scheme. We now 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.

Northern Area Rainfall



Northern Area
Percent of Long Term Average Flow



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 m³ from Diversion 1 and 15,560 m³ 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 drawn down 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 m³ 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 m³ 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 Ecological assessments 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 work 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

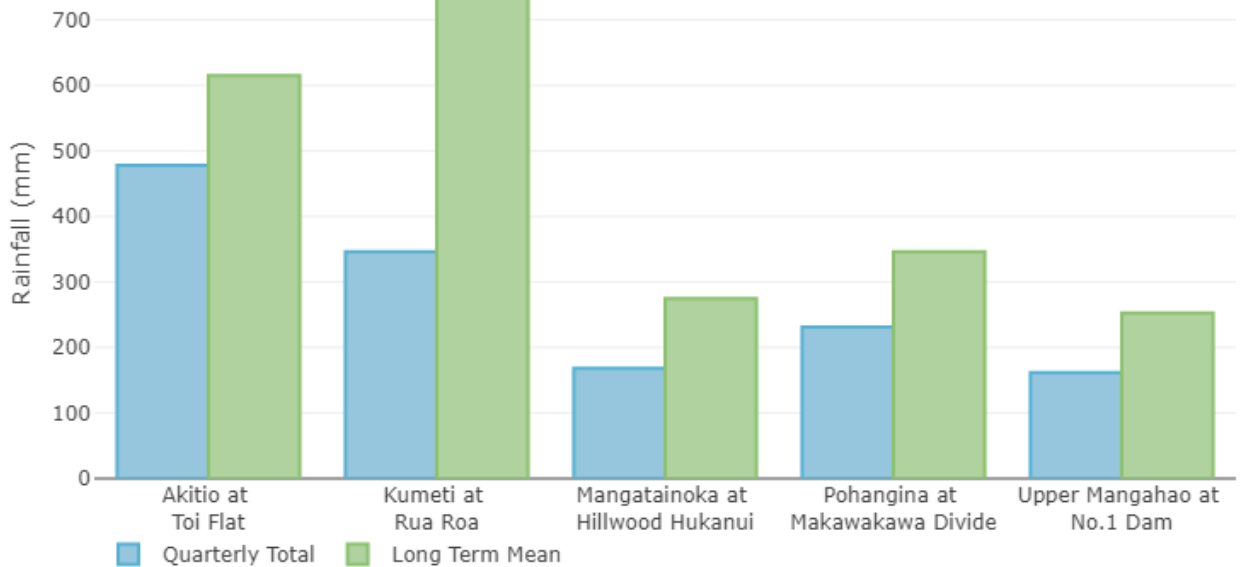
GENERAL

- 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

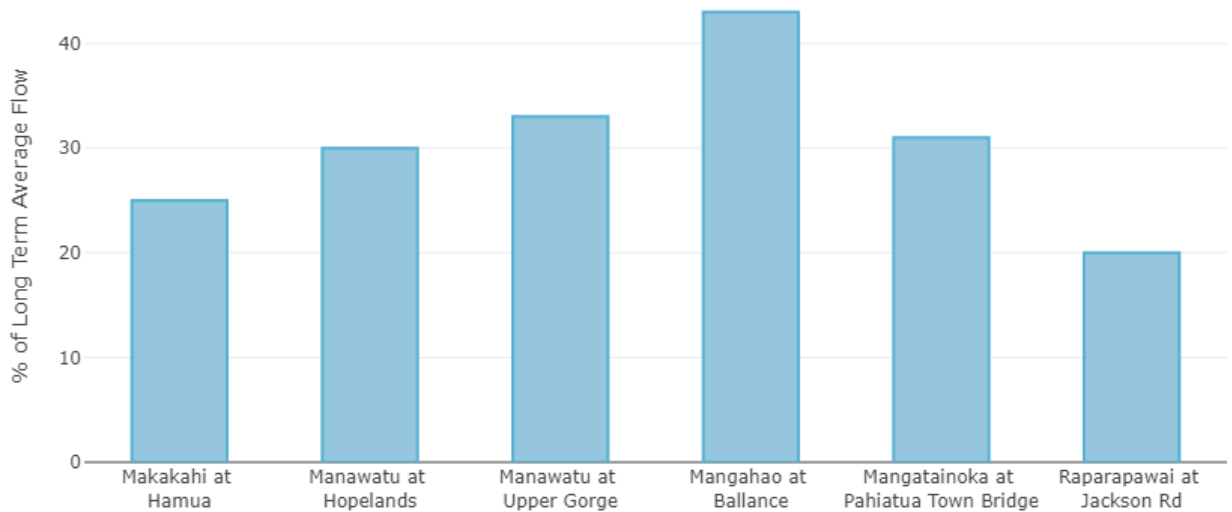
in the Mangatainoka catchment. For the rest of the district, river levels have remained static and very low for this time of the year.

- 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.

Eastern Area Rainfall



Eastern Area
Percent of Long Term Average Flow



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.

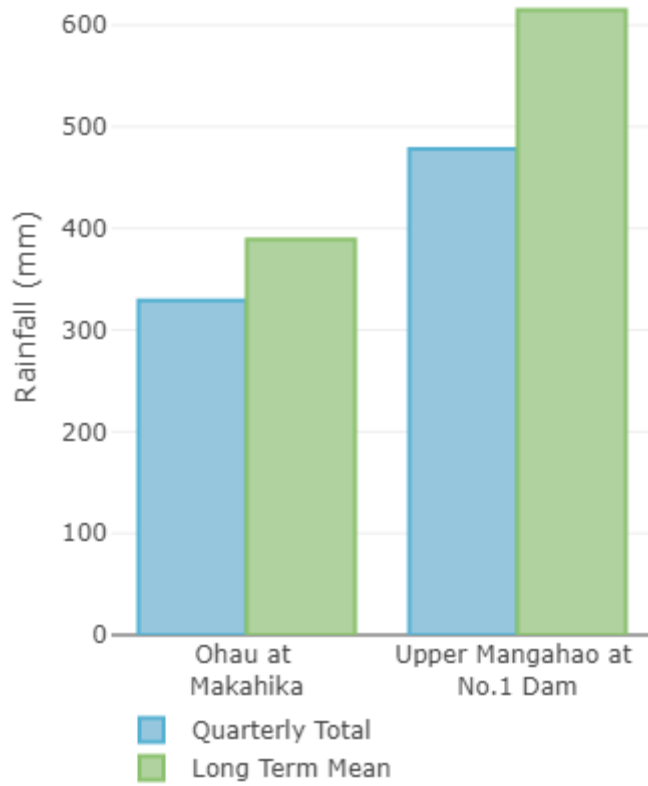
10. SOUTHERN AREA

GENERAL

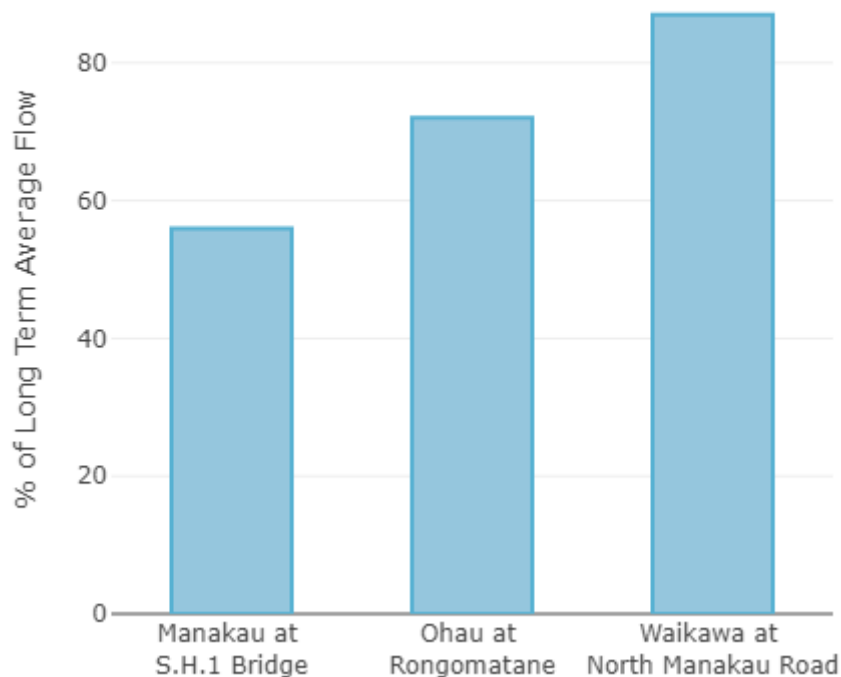
- 10.1. Settled weather and good ground conditions have allowed our spray contractors to complete the majority of the autumn spray programme. Some isolated section of drains where access had been problematic still need to be completed but we are working with the landowners in these areas and these should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



Horowhenua Area
Percent of Long Term Average Flow



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.