

Report No.	18-119
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 1 June 2018 to 31 July 2018.

### 2. RECOMMENDATION

That the Committee recommends that Council:

- a. receives the information contained in Report No. 18-119.

### 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 2015-25/ 2018-2028 **Long-term Plans (LTPs)**; is covered by an approved carry-forward of unexpended budget in 2016-17/ 2017-18; or additional approval will be specifically sought by way of recommendation in the item.

### 4. COMMUNITY ENGAGEMENT

- 4.1. Various matters contained in this item either have been, or will be, communicated with scheme ratepayers through their respective Scheme Liaison Committee and / or Catchment Community Meetings. As necessary, other issues will be the subject of media releases or where necessary / warranted specific community engagement (e.g. public meeting).

### 5. SIGNIFICANT BUSINESS RISK IMPACT

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

### 6. DISCUSSION

- 6.1. As noted to Committee members at the last meeting (the event coincided with the meeting), mid-June saw a flood event in both the Manawatū and Rangitikei Rivers. Although easily contained by the network (slightly less than a mean annual event at the Teachers College hydrometric site), the event in the Manawatū was of sufficient size to require the utilization of the Moutoa floodway (the duration of the gate opening was however relatively short).
- 6.2. Most impacted were the Pohangina and Oroua Rivers; a meeting of the Scheme Liaison Committee will take place shortly to provide ratepayers with an overview of the damage and the likely impacts for the scheme. The funding policy for the Pohangina-Oroua Scheme requires costs for bank protection works to be apportioned 60:40 between the landowner and the scheme respectively, making expenditure forecasts for this activity area difficult. The Pohangina-Oroua Scheme has a health reserves balance (just under \$600,000 at the end of the last financial year).

- 6.3. An initial assessment of Rangitikei River flood damage indicates a repair bill of up to \$300,000, much of which is likely to need to be sourced from reserves.
- 6.4. Staff met with GNS Science around finalising the scope and timing of work looking at Manawātū Gorge stability, specifically determining if credible river-blocking landslide scenarios exist. If they do the work will include where they would be most likely to occur, with what frequency and estimates around the associated flood risk. The work is funded by way of a **Ministry of Civil Defence and Emergency Management (MCDEM)** resilience grant and is tentatively (the 2016 Kaikoura earthquake has placed considerable demand on GNS Science) scheduled for completion in March 2019.
- 6.5. Nationally the **River Managers' Special Interest Group (RiMSIG)** has continued to progress the four action areas identified in the 2017 report on the state of the sector. Effort / resource has also been directed toward building a case for financial assistance from central government, an initiative that will continue to be shaped / defined as the year progresses.
- 6.6. Matters relating to the condition of the lower Whanganui River training works and the programme of works required to address what are largely matters of deferred maintenance continues to progress. The Whanganui Port Revitalisation project has a strong dependency on the integrity of those structures and accordingly the collaborative approach with the **Whanganui District Council (WDC)** to secure funding assistance from central government has continued. Activity over the period included an update on the river management component to the June Whanganui Leaders' Group meeting.
- 6.7. River Management staff met with **Horowhenua District Council (HDC)** staff early in the new financial year to discuss the next steps with the Foxton relief pipeline project. Year 1 of the LTP identifies investigation (intended to include reviewing the efficacy of the preferred solution), design/ documentation and revisiting the Foxton East Drainage Scheme targeted rate classification. Horowhenua District Council have agreed to provide the project management resource and have commenced the process of procuring a consultant to assist with these tasks.
- 6.8. The period has also seen staff strengthen relationships with other regional council river management teams. Waikato Regional Council staff visited in early July; staff provided an overview of our operational activity and the teams discussed matters of overlapping interest. In June, the management team met with Greater Wellington Regional Council flood protection staff, including an overview of the Lower Wairarapa flood control scheme.
- 6.9. Those interactions provide a range of benefits, not the least of which is providing a strong foundation for the inter-assistance agreement, where regional councils / unitary authorities draw on the resources of others should they be impacted by a large flood event. Horizons has been a past recipient of this arrangement and provided portable pumps to the Bay of Plenty Regional Council following last years' Edgecumbe floods.
- 6.10. Civil Defence Minister Hon. Kris Faafoi has responded to the Chairman's letter around whether reducing individual scheme emergency reserves would have any material impact on future claims for financial assistance from MCDEM for flood damage. More specifically, the guide that accompanies the part of the National Civil Defence Emergency Management Plan relating to Essential Infrastructure Recovery Repairs makes specific references to the local authority having "sound financial provisions".
- 6.11. The guide defines sound financial provisions as measures such as "the provision of reserve funds, effective insurance or participation in a mutual assistance scheme with other local authorities to a level sufficient to ensure that the local authority could reasonably be expected to meet its obligation to provide for its own recovery".
- 6.12. The Minister's correspondence is unequivocal around the question asked; whether an individual scheme carries reserves and to what level will have no bearing on MCDEM considerations around financial assistance under the Plan.

- 6.13. The conclusion of the 2017/18 financial year has, amongst other things, provided the opportunity (as is the case at the end of every financial year) to recalculate the overall reserves position for river management schemes. The drawdowns over 2017/18 were offset by contributions, the tail end of MCDEM payments relating to the June 2015 flood event as well as some accounting changes, with the total \$0.5M up on the previous financial year.
- 6.14. At a larger timescale the reserves balance at the end of the 2014/15 financial year was \$7.75M compared to just under \$8M at the end of the 2017/18 year, the major hit in between being the June 2015 event. However, in real terms (the balance as a percentage of the target amount, updated to accommodate the change in asset values) reserves have reduced slightly. At the end of the 2017/18 financial year, that percentage is 40% (the target amount is \$20M).
- 6.15. End of year processes have also identified an issue with asset valuations, specifically the valuations relating to Horizons detention dam inventory; a preliminary assessment suggests that the valuations may not be correct, creating a potential risk particularly in major damage scenarios. That issue will be addressed this financial year in combination with the roll-out of the new asset management information system.
- 6.16. The River Management group farewelled retiring Area Engineer Lew Marsh at the end of June. James Feary is the new Eastern Area Engineer. Other staff movements include the appointment of Gerry Linklater to the role of River / Drainage Supervisor based in Marton and the resignation of Project Engineer Geoff Gibson.

## 7. INVESTIGATIONS AND DESIGN

- 7.1. Through June and July, the demands on the Investigations and Design Team have remained high as the construction season has drawn to a close and focus moved to the end of the financial year. Work has continued on producing a range of designs and advice to support the wider River Management group as well as providing advice to the regulatory and district advice teams. In addition, staff have invested time to prepare work programmes for the coming year.
- 7.2. The following summarises the work that the team has undertaken over the past couple of months.

### Lower Manawatū Scheme

- 7.3. With the winter months upon us, design work in this area has focused on the projects programmed to be undertaken in the coming summer construction season. This includes consideration of the required stopbank heights and potential alignments at Himitangi Block Road as well as the remaining Oroua works. Ongoing advice has been provided to the Lower Manawatū Scheme as required in terms of various erosion issues and to support the work of **Palmerston North City Council (PNCC)** as it relates to the Manawatū River corridor through Palmerston North.
- 7.4. The work to replace the 1 dimensional model of the Manawatū River through Palmerston North with a 2 dimensional model continues to progress. To date a hydraulic modelling expert has been engaged to develop a detailed scope of works required to enable the engagement of a consultant to build and deliver the model.
- 7.5. An important part of the work is ensuring that the model built has an adequate level of resolution as well as being easily updateable, important as enhancement of the river corridor progresses. The modelling work is forecast to be fully completed in the first few months of this financial year.

### **Manawatū Drainage Network Assessment**

- 7.6. This project is intended to drive a long-term programme of upgrades that will ultimately achieve both a more uniform level of service as well as assisting in ensuring good land use decisions are made as more development pressure is applied to the area (in broad terms) between Feilding and Palmerston North.
- 7.7. The modelling required is a complicated task involving the combination of 1 dimensional and 2 dimensional models to best represent the complex interactions associated with the drainage network, overland flows, culverts, and other structures. The scoping of the required work has been completed; staff are currently engaging a consultant to undertake the required modelling work, having been through an 'Expression of Interest' process to identify consultants with the skills and resource necessary to undertake the required work.

### **Flood Detention Dam Management**

- 7.8. Staff in the Investigations and Design team continued to project manage the Dams Safety assessment during this reporting period. The final deliverables of this project have now been provided to Council – an overview of the condition assessment work forms part of the meeting agenda.

### **Rangitikei River Gravel Resource Study**

- 7.9. With increasing interest in the gravel resource of the Rangitikei River from commercial extractors, focus has been placed on finalising this gravel resource study. Much of the work involved in this study was completed in parallel with the management strategy work carried out by consultant Gary Williams (reported to the last Catchment Operations Committee meeting). The study has now been completed and its findings are reported in a separate Agenda Item.

### **Pohangina River**

- 7.10. During this reporting period staff have produced a few designs along the Pohangina River. Notably a design is being produced for erosion protection on the true right bank of the river immediately upstream of Raumai Bridge. Recent floods in the river have begun to attack the river bank in this location and as such, the Investigations and Design team have been working closely with the Northern Area team to develop a sustainable solution for the river in this challenging reach. This work is fully funded by the **Manawatū District Council (MDC)**.
- 7.11. The other notable issue in the Pohangina River is at the Churchill Road Bridge at Totara Reserve. This bridge has been affected by recent floods with MDC seeking advice on ways to sustainably manage flood conveyance capacity underneath the bridge.

### **Resource Consents for River Management Works**

- 7.12. In collaboration with the Northern Area team, staff have begun to develop resource consent applications for the proposed high flow diversion channels on the Rangitikei and Pohangina Rivers. These proposed works are different in nature to the type of works that have traditionally been undertaken by the River Management group and as such, it is necessary to apply for resource consent. These applications are progressing well enabling physical works to commence as soon as river flows allow next summer.

### **Asset Management**

- 7.13. This reporting period has seen the end of the financial year and as such, considerable effort has been put into the asset management side of our business. Work has gone into compiling the asset register data for capitalisation and ensuring that this data is both

relevant and accurate. Following on from this the capitalisation work has been undertaken as a combined effort with the finance team. Staff have also been heavily involved in the deployment of the new **Asset Management Information System (AMIS)**.

**Regulatory Advice**

7.14. 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**

7.15. Work on the Rural Upgrade Project this period has been focused on adequate closing and securing of sites in preparation for winter, and preparation of works for the 2018-2019 construction season. Alongside the usual negotiation of Land Entry Agreements, formation of tender documents, and running of the tender process, this preliminary work has also included significant work with Iwi, both as affected parties and as landowners. Several particular projects being prepared involve complex landowner negotiations, as some work requires the construction of new stopbanks rather than upgrading existing structures.

7.16. The following table schedules all current Rural Upgrade Project works and provides commentary on specific project status.

Project Title	Description	Status
Manawatū River Right Bank Stopbank Upgrade, Himatangi Block Rd.	Upgrade 5,700 m of existing stopbank on the Manawatū River right bank upstream of the Moutoa Floodgates.	This contract has been put to market, with tenders closing on July 31. Contractors have shown a good level of interest in this large contract and staff are anticipating high quality tenders. The work also has a high level of iwi interest, and communication with two key groups is ongoing.
Manawatū River Left & Right Bank Stopbank Notch, ML5 & MR11	Upgrade four short low sections of Manawatū River left and right bank stopbank crest in the vicinity of Foxton-Shannon Rd.	A private survey company and approved (Plant Hire Register) contractor will be engaged to complete these works when ground conditions and resourcing permits.
Oroua River Left Bank Stopbank Upgrade, Upstream of Awahuri Bridge Through Bailey Property	Construct new stopbanks on the left bank of the Oroua River from the SH3 Bridge at Awahuri approximately 1 km through the Bailey Property.	Resistance to the proposed works has been experienced which prevented these works from commencing during the previous construction season. Alternative land acquisition processes have commenced under the Public Works Act.
Oroua River Left Stopbank Upgrade, Bailey Property to Feilding Golf Club	Construct new stopbanks on the left bank of the Oroua River from Bailey Property Boundary to the Feilding Golf Club	This contract was put to tender from early June, closing on July 31. There has been interest from Contractors which is encouraging after receiving zero tenders in 2017 when initially tendered. The construction will be complex with a two zone bank proposed to minimize costs.

<p>Oroua River Right Bank Stopbank Upgrade, Makino Stream Confluence to Kawakawa Rd.</p>	<p>Construct new stopbanks, and upgrade existing, on the right bank of the Oroua River from Boness Rd to the northern end of the MDC Waste Water Treatment Plant. This project will extend over a river distance of approximately 2,000m.</p>	<p>A contract was awarded to Higgins Contractors Limited. Due to the good progress made and willingness from landowners the contract was extended to include two additional blocks upstream. However, due to wet ground conditions, only one of the two extensions were completed. The remainder of the work is to be retendered this financial year.</p>
<p>Oroua River Right Bank Stopbank Upgrade, Kawakawa Rd to Aorangi</p>	<p>Upgrade and construct new stopbank on the right bank of the Oroua River.</p>	<p>Due to local silts being very sandy, borrow material is proposed to be transported from an MDC borrow site. The contract was tendered and received no-conforming tenders. The job was retendered at the start of June with tenders to close July 31. Interest from contractors has been promising.</p>
<p>Oroua River Left &amp; Right Bank Stopbank Upgrade Upstream of SH 54.</p>	<p>Investigate, design and construct appropriate flood protection to the left and right banks of the Oroua River upstream of the SH 54 bridge at Feilding.</p>	<p>Landowners and MDC have been consulted with. The works will be open to tender mid-August, proposing a Design and Build contract.</p>
<p>Makino Stream Right Bank Stopbank Extension, Makino Floodgates.</p>	<p>Investigate, design and construct an upstream extension of the existing right bank stopbank to prevent outflanking.</p>	<p>Investigation has confirmed the need to extend the network at this location. Preliminary design work has been completed – next step is discussion with affected landowners.</p>
<p>Linton Main Drain Left and Right Bank Stopbank Upgrade, Tane Rd</p>	<p>Upgrade existing stopbanks on the left and right banks of the Linton Main Drain downstream of Tane Road. Works extend over a river distance of 1,000 m. The right bank involves significant road reconstruction along the crest of the upgraded stopbank.</p>	<p>A tender for this project was awarded to Pratt Quarries Ltd 2016. While work is substantially complete and the banks are providing the agreed level of flood protection, there are some remaining ancillary works to be completed during the 2018/19 construction season.</p>
<p>Tokomaru River Stopbank Upgrade, Below Opiki Rd (Rutted Section)</p>	<p>Upgrade existing stopbanks on the left and right banks of the Tokomaru River downstream of Opiki Road. Works involve importing approximately 8,000m<sup>3</sup> of fill material over four sections (2,000m) of stopbank.</p>	<p>A contract for this work was awarded to John Ray Ltd. Work was expected to be completed during the 2018/19 construction season, however inclement weather forced a suspension in May 2018. Work is programmed to resume in November to be completed by the end of 2018.</p>
<p>Tokomaru River Stopbank Right bank Upgrade, Opiki Rd to Boundary Pumpstation.</p>	<p>Upgrade existing stopbanks on the right bank of the Tokomaru River upstream of Opiki Road. Works extend over a river distance of 4,000m</p>	<p>Tenders closed for this work in late February with one tender received. This tender was approved by the AR&amp;I Committee on 27 March. Work will be undertaken over the 2018/19 construction season.</p>
<p>Tokomaru River Stopbank Left bank Upgrade, Opiki Rd to DOC Reserve.</p>	<p>Upgrade existing stopbanks on the Left bank of the Tokomaru River upstream of Opiki Road. Works extend over a river distance of 4,000m</p>	<p>Survey and drawing for this work is complete and staff are currently in negotiations with landowners regarding access to local fill material. Once confirmed this contract will be able to be put out to tender for construction in 2018/19</p>

15 August 2018

<p>Tokomaru River Stopbank Upgrade to North Island Main Trunk (NIMT) Railway Line</p>	<p>Upgrade existing stopbanks on the both banks of the Tokomaru River from Boundary Pumpstation to NIMT. Works extend over a river distance of 2,300m</p>	<p>Survey and drawing of this work has been completed and a stopbank stability report commissioned. Work is programmed to be tendered for construction in 2018/19.</p>
<p>Mangaore Stream Left and Right Bank Stopbank Upgrade, Shannon</p>	<p>Upgrade existing stopbanks on the left and right banks of the Mangaore Stream downstream of Otauru Road, Shannon. Works will extend over a river distance of 2,700 m.</p>	<p>A tender for this project was awarded to Graeme Bagrie Ltd. Stopbank work is complete and the work to replace a culvert removed from the contract. Practical completion has been issued for the stopbank work and a new minor works contract to replace the culvert drawn up and signed for completion in 2018/19.</p>
<p>Kara Creek Paddocks, Left &amp; Right Bank Stopbank Upgrade.</p>	<p>Upgrade existing stopbanks on both banks of Kara Creek Upstream of SH56.</p>	<p>Programmed for the 2018/19 construction season.</p>
<p>Mangapuketea Stream Left &amp; Right Bank Stopbank Upgrade.</p>	<p>Upgrade existing stopbanks on both banks of the Mangapuketea Stream Upstream of the Kara Creek confluence.</p>	<p>Programmed for the 2018/19 construction season.</p>
<p>Protect Individual Property – Meehan’s, 9 Tiakitahuna Rd.</p>	<p>Provide flood protection around the Meehan house at 9 Tiakitahuna Rd, Rangiotu.</p>	<p>Consultation is in progress with the landowner to agree a suitable flood protection solution for this property. A proposed design has been accepted by the landowner, however existing stormwater issues have resulted in the request for a drainage consultant to be engaged to work in parallel with the house bund. Works are now programmed for completion in 2018/19 in parallel with 939 Lockwood Rd.</p>
<p>Protect Individual Property – Strahan’s, 1450 Rangiotu Rd</p>	<p>Raise the Strahan house at 1450 Rangiotu Rd, Rangiotu</p>	<p>Affalon Building Consultants have been engaged to manage the house raise which is to be undertaken at the property. Detailed Drawings are complete and the work has been put to tender, closing in early August.</p>
<p>Protect Individual Property – McNeil’s, 939 Lockwood Rd</p>	<p>Provide flood protection to the McNeil house at 939 Lockwood Rd, Rangiotu.</p>	<p>Consultation with the landowner has occurred. Survey and design work are in progress to construct an earth bund around this house whilst minimizing disturbance to the surrounding lawns and amenities. Works are to be tendered mid-September in conjunction with 9 Tiakitahuna Rd.</p>
<p>City Reach Project: Benmore Ave Stopbank Upgrade – Whiskey Creek</p>	<p>Upgrade a section of the Flyers Line Spillway stopbank adjoining Benmore Ave, Palmerston North.</p>	<p>This project was programmed for 2017/18. A contract was let via a select tender and negotiation process. However due to the wet weather works are to be held off until the 18/19 construction season.</p>
<p>City Reach Project: Benmore Ave Stopbank Upgrade – Concrete Wall</p>	<p>Upgrade concrete wall adjoining residential properties at Benmore Ave, Palmerston North.</p>	<p>Survey and Investigations are in progress for this work, which is currently programmed for 2018/19.</p>

## 8. CENTRAL AREA

- 8.1. The reporting period was characterised by consistent rain through both June and July.
- 8.2. The total rainfall for this period (1 June 2018 to 23 July 2018) was: 150 mm at Milson Line on the Mangaone; 172 mm at Cheltenham, Makino; 276 mm at Scott's Road, Kahuterawa; and 344 mm at Rangiwahia, Oroua.
- 8.3. The Manawatū River at Teachers' College peaked on 13 June at 1277 cumecs (5.16 m), triggering a 4.9 m warning with the Moutoa Gates being opened. The Oroua River at Almadale Slackline peaked on 12 June at 384 cumecs (4.47 m). This triggered the 4.2 m flood warning, Hoihere Road was closed and the Rangiotu Spillway operated, albeit modestly.
- 8.4. A separate weather event saw the Mangaone Stream at Milson Line peak on 18 June at 56 cumecs (3.3 m). The Makino Stream at Reid's Line peaked on 18 June at 30.6 cumecs (1.92 m), just short of the gate / floodway operating threshold. The Tokomaru at Riverland Farm peaked on 8 July at 26 cumecs (2.1 m).

### General

#### Engineering Advice

- 8.5. During this reporting period, there have been many requests for advice on a variety of issues, particularly in non-scheme areas. Some of these issues have been erosion problems requiring advice and design solutions.
- 8.6. The end of year inspection of assets has been completed. Initial indications are that scheme assets are in a better overall condition this year than last year. The notable exception is scheduled tree maintenance, which is still several years behind programme. Due to funding constraints, scheduled maintenance has been deferred in order to undertake priority flood damage repairs. The forthcoming programme of works will hopefully play catch up with the deferred maintenance, floods permitting.
- 8.7. In July, staff celebrated River Management team member Warren Kimura's 45 years of service.

### LOWER MANAWATŪ SCHEME

- 8.8. Works undertaken on the various rivers within the scheme during this period include the following:

#### Manawatū River

- 8.9. The three large rock groynes at Ashhurst Domain have performed well since their completion in early May with encouraging silt deposition patterns occurring. The groynes have been constructed to the mean annual flood level and have already been submerged several times so far, including the Moutoa Gate opening event on 12-13 June. The upstream groyne suffered a small amount of damage in that event, as did a section of bank above the middle groyne. Repairs will be effected over the next few months. The river bank face / margin has remained stable since the groynes were built and will be planted over the next few weeks. The river appears likely to remain in a state of flux at the confluence with the Pohangina, requiring ongoing and adaptive management.
- 8.10. Rock delivery has commenced and is continuing for the additional rock protection under the Ashhurst Bridge. This rock lining will protect the PNCC river pathway and the SH Bridge from further erosion, as well as provide some river alignment benefit. Placement will be undertaken this coming construction season. Both PNCC and **New Zealand Transport Agency (NZTA)** have been fully invoiced for their financial contributions.

- 8.11. The compacted gravel ramp at Ashhurst, although suffering some damage, is still enabling public access to the beach area. Horizons is working on a solution with PNCC to incorporate more permanent access into the additional rock protection to be done in this area.
- 8.12. The recently completed esplanade rock lining has performed well during recent high rainfall and river level events. This area will be planted with willow poles this planting season and potentially undergo some further bank shaping this summer.
- 8.13. As noted previously, staff observed that stormwater discharge was likely to be affecting the esplanade rock lining. At Horizons request, PNCC have subsequently installed a new stormwater sump and floodgate to reduce the rilling and erosion damage that had been occurring in high rainfall events. The area is being monitored and both parties are aware that some further contouring work may be required.
- 8.14. Staff have continued maintenance tasks along the Manawatū River, floodway and around the Moutoa Gates. A section of tied tree works has been repaired, along with willow pole planting at two sites. Staff are working to source poles for the remaining sites requiring planting however, with the saturated ground, access remains an issue.
- 8.15. The six-weekly testing regime of the Moutoa Gates recently identified issues with two gates. These issues were solved prior to the gate opening event that occurred in June. A different, but minor fault in the clutch system of gate 3 was identified during the event, but did not affect the overall gate operations. The gates are over 55 years old, and a full mechanical assessment has been programmed for this year.
- 8.16. Note that use of the Moutoa floodway is a costly exercise, typically resulting in approximately \$30k of costs to the scheme with repairs to scheme drains, clearing of debris, removal of silt from the spillway apron, damage to fences and pumping costs for dewatering.
- 8.17. Staff continue to work with PNCC concerning the new pedestrian bridge over the Manawatū River and the Turitea and Kahuterawa Streams, and the paths connecting these structures. Construction work on the Manawatū River bridge abutments and city-side approach area is progressing well.
- 8.18. Work has been completed on repairing the revetment protecting the concrete wall that in turn provides flood protection at Hartley Street in Foxton Beach Township; the demolition material originally used had a short shelf life. The work consisted of placing 2000 tonnes of rock riprap on a heavy-weight geotextile.
- 8.19. There has been significant interest and support in the community for the works, and staff worked closely with the public to ensure all concerns were addressed. This involved the reinstatement of an access ramp to the estuary, providing the foundation for a new walkway along the estuary side of the wall and avoiding a stone circle memorial. A Foxton Beach resident wrote to us with the following comment:
- “...I must give credit where its due -- The young Horizons engineer Andrew Williams did a very good job of handling what could have been an extremely difficult job of trying to get 2000 ton of rock laid in the middle of a residential area -- From the time the locals first met him he always got back to us promptly with any questions or concerns we had - - 10 out of 10 for the way he handled this project – “**
- 8.20. Safety rails have been installed on pier 0 of the Moutoa Gate structure. This has been done to improve the safety of the structure. In high flow events and gate openings, this area is accessed by the public and existing safety precautions were not deemed adequate.
- 8.21. Staff attended a meeting with **Manawatū Marine Boating Club (MMBC)**, Manawatū Coastguard, **Department of Conservation (DoC)** and HDC to determine responsibilities for asset maintenance at the Foxton Harbour Improvements Reserve. The assets include a boat ramp and wash-down area, and a public amenity area with a BBQ and picnic tables,

which are owned / maintained by the MMBC under a lease with DoC. It was agreed that the assets should be managed by HDC, and therefore a formal request to HDC by DoC would be produced for them to adopt these assets.

- 8.22. Ahimate Park development by PNCC is continuing. River management staff are keeping a close eye on land disturbance and working with compliance staff to ensure that sediment traps are fit for purpose. The park development has generally reached a stage where resource consents will be required for much of the remaining work, such as the car park. Recently PNCC has approached Horizons regarding the creation of a free camping site within Ahimate Park, and possibly near the Albert Street river entrance. Any activity in this area will require a resource consent and must be compliant with our Regional Plan which provides policy on minimising and avoiding hazards for new activities in floodable areas.
- 8.23. Works on the Whirikino trestle bridge replacement are ongoing, with fill being imported to build the causeway between the river and the spillway, super-tee beams being placed on columns in the spillway and excavations into the stopbanks to build bridge abutments all being undertaken. The recent Moutoa Gate activation caused a flurry of activity to remove plant and equipment from the spillway. The temporary roads across the drains did slow the dewatering of the spillway and engineers instructed the contractor to undertake some emergency works to rectify the problem.

#### **Oroua River**

- 8.24. Staff have been working with MDC to remove debris from the Aorangi, Kopane and Hoihere Bridges. This is done to relieve pressure on the bridges themselves and also prevent scour on the surrounding banks.
- 8.25. Annual asset inspections have been completed, and are currently being uploaded into the AMS.

#### **Mangaone Stream**

- 8.26. The Mangaone Stream city reach is frequently inspected by scheme engineers and is in good condition. A section of slumping upstream of the Rangitikei Line Bridge previously identified and being monitored began to enlarge during the high flow event in June. As the width of berm in this section is limited, emergency repairs were undertaken soon after to stabilise the area. Rock was placed from the opposite bank using a long reach excavator and once ground conditions allow, the site will be revisited to undertake the finishing of bank shaping work. General maintenance tasks such as mowing, weed spraying and debris removal are continuing when required due to the time of year. Staff are also continuing to respond to public enquiries and, where appropriate, work with PNCC to find and action solutions.
- 8.27. Horizons and PNCC are working closely together to clear and stabilise the lower reaches of the Mangaone. PNCC and the Fresh Water Improvement Fund will be funding these works, with River Management staff undertaking the works under the Environmental Code of Practice for River Works. Mulching of the true left bank is programmed for late July or early August. There is a Pa site in this reach of the river, and as such, staff are liaising with Rangitāne in regards to work around this area and to preserve the site. The aim of the work is to improve river access to the stream and eventually extend the path along the Mangaone to the Manawatū River
- 8.28. Urban Development is ramping up on the edges of Palmerston North city. There are significant plans for development near the airport along Flyers Line and upstream and downstream reaches of the Mangaone at Pioneer Highway Bridge. This type of land use change has the potential to impact flood protection; flow paths are altered, more hard surfaces lead to faster and higher flows, and (potentially) additional stormwater discharge points to the Mangaone. Staff are working with both the Regulatory team, PNCC and the

developers to ensure that stormwater discharges do not cause any adverse effects to the Mangaone.

- 8.29. Gravel relocation was undertaken on the Mangaone. This was done to reduce pressure on the outside of bends by relocating gravel from beaches pushing out on the inside.

### **Turitea Stream**

- 8.30. Engineers are working with a number of stakeholders to develop a long-term strategy to enhance the Turitea Stream. An inaugural meeting was held at Massey between stakeholders; including Horizons Freshwater team, PNCC, Massey University, Rangitāne, Urban Eels, Ag Research, Freshwater and Green Corridors, to kick off the enhancement strategy.

### **Makino Stream**

- 8.31. The annual programme of stream channel maintenance was completed ready for the winter high flows. This involved the mulching and / or removal of unwanted vegetation, the removal of any flood debris, the tidy up of existing protection works, and the relocation of any gravel build ups. The reach of stream involved was from North Street, Feilding, upstream to Port Street, Root Street, and half way to Reid's Line
- 8.32. A rock lining erosion repair was completed in the James Palmer Reserve, Feilding.

### **Jacks Creek**

- 8.33. During the last flood in Jacks Creek, an existing culvert crossing collapsed and partially blocked the stream channel. This was removed.

### **Tokomaru River**

- 8.34. Mulching was undertaken on the Tokomaru River from 7 km to 8 km on both banks.

### **Lower Kiwitea Stream Scheme**

- 8.35. Concrete riprap material was stockpiled for future erosion repairs. An annual inspection of all scheme assets was completed.

### **Ashhurst Stream Scheme**

- 8.36. A small timber floodwall was constructed on a residential section along Napier Road, Ashhurst.
- 8.37. An annual inspection of all scheme assets was completed. Vegetation was removed from the stream channel, upstream of the North Street Bridge.

## **9. NORTHERN AREA**

### **General**

- 9.1. Wet conditions in the Northern Area during June and July have created challenging conditions for staff and limited site access in many areas. The intense weather front that affected the northern and eastern catchments on 12 June resulted in a 25 year return period flood in the Rangitikei River at Mangaweka and a 50 year return period event in the Oroua River at Almadale. Staff have been kept very busy following up on customer queries, compiling damage lists and estimating repair costs from this event.
- 9.2. In addition to flood work our regular work continues. The end of year maintenance work has progressed well with the work programmes being completed for all schemes. Our end of year asset inspections are now almost complete and data from these site visits is expected to be entered into the AMS by 3 August.

### **Community Involvement**

- 9.3. Staff assisted in a Community Planting Day that saw 350 natives planted at Galpins Road on the Tutaenui Stream.

### **Rangitikei River Control Scheme**

- 9.4. A significant weather front brought heavy rain to the upper catchment on 12 June resulting in a 25 year return period event that raised water levels to 7.6 m at the Mangaweka hydrometric station triggering a Level 10 flood alarm. River levels have remained high following this event and when matched with very wet ground conditions have made access to many sites for flood damage assessment very difficult.
- 9.5. From information received to date, there are reports of extensive debris deposits across gravel beaches and log blockages within the channel that will require clearance. Damage to scheme assets appears to be moderate with approximately \$300k of identified repair work. Staff are continuing to collate damage reports, assess priorities, prepare work programmes and confirm budget requirements.

### **Rangitikei Maintenance Works**

- 9.6. The flood on 12 June was a good opportunity for new staff to see how the Rangitikei River behaves in high flows. This was particularly the case for the three high flow diversion channels at Hastings Rock, Sanson Metals, and Onepuhi, that were cut through high priority beaches to help alleviate river bank damage on the outside of tight bends.
- 9.7. The channel widening upstream of Collivers proved very successful with flows now maintaining a more parallel flow around the cliff face rather than attacking the right bank on a perpendicular path, encouraging aggressive erosion.
- 9.8. The annual asset inspections were completed in the last week of June and entered into the AMS system. These inspections along with flood damage reports and recommendations from the recent Rangitikei River management strategy work will form the next years' work programme.

### **Planting**

- 9.9. Five thousand willow poles have been supplied from the Woodville nursery this year and emphasis has been placed on improving the standard of the Haylock and Kakariki nurseries. All poles have now been harvested from the Kakariki nursery and the site is ready for spraying, mulching and extending. The Haylocks nursery has been partially harvested and will be completed within the next few weeks.
- 9.10. Willow poles have been planted upstream of the Bulls Bridge on the right bank and at the Walkers property, Parewanui Road, 18 km on the right bank. At the Walkers, we have experimented with the layout of the planting and instead of planting several rows parallel to the natural meander we have planted on blocks perpendicular to the meander. The idea being that once established they will act as a live tree groyne.
- 9.11. Many other planting sites have been identified following river / asset inspections from both the ground and air.

### **Amon Drain**

- 9.12. Amon Drain outlet was desilted and cleared of willows and bamboo. A new weight was attached to the floodgate when it was observed that the floodgate was not closing correctly.

### **Stopbanks**

- 9.13. A small area at the end of the Scotts Ferry stopbank was cleared and sown with grass to make it safer for machinery to turnaround when spraying and mowing the stopbanks.
- 9.14. Small scour holes were repaired in the Webb / Taylor Road guide bank.
- 9.15. There have been two cases of cows grazing the stopbanks in early June. Staff have followed these up with verbal warnings to the stock owner and a damage assessment will be undertaken in the summer.

### **Forestry**

- 9.16. An external valuation of the scheme forestry blocks is underway to provide accurate information to the AMS system and for insurance cover. From the report will also come cost estimates for upcoming maintenance work and potential future harvesting dates.
- 9.17. The Bulls Loop Road forestry block is continuing. To prevent downstream damage from lost trees, we are proactively removing those of highest risk and reshaping the river bank.

### **GBC Winstone Haul Road**

- 9.18. The Haul Road was significantly damaged in the 12 June flood. Vegetation clearing and fence removal is due to start in the next few weeks to allow the Haul Road to be moved back 60 m inland.
- 9.19. Flood damage - urgent repairs following the 12 June flood event:
  - 90 meter hole in the Webb Rock / Guidebank on Taylor Road.
  - 20 m hole under the Kakariki Rail Bridge on the left bank.
  - Rock repair to Mary Wilson Rock.

### **Rangitikei Capex Works**

#### **Parewanui Stopbank Upgrade for 2017-18 (June)**

- 9.20. The Parewanui stopbank upgrade work is located on the Walmac Farm near Scotts Ferry from river distance 4.5 km to 5.5 km. The contract work has upgraded 750 m of stopbank and filled a major (1 hectare) scour hole.
- 9.21. Contract tender documents were out for the period from mid-October to mid-November. Contract tenders closed on 16 November 2017 with only one tender being received. The contract was awarded to M&M Earthmovers Ltd for a sum no greater than \$340,000. Contract works commenced on 23 January and the Practical Completion Certificate was issued on 12 June 2018. Dry density and compaction test results are adequate against specification standards and as built show correct construction.
- 9.22. The only work remaining is the filling and shaping of the upstream scour holes, which has been removed from the contract and postponed until ground conditions are favorable.

#### **Gravel Extraction Sites – GBC Winstone**

- 9.23. No gravel extracted from the scheme consent this period.

#### **Rangitikei River Global Gravel Extraction Consent (July)**

- 9.24. Good Earth Matters have 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. The letter to existing consent holders was sent in February, allowing one month for

feedback to be submitted. A draft consent application is now underway and is expected to be completed by the end of August 2018. Consultation will commence in August and continue into September.

### **Rangitikei River Enhancement**

- 9.25. Fencing of the new native plantings adjacent to the Bulls Bridge is likely to begin in the next few weeks and will be a joint collaborative effort between two sections of Horizons and the Bulls community.

### **Gravel Extraction**

- 9.26. A consent application is being processed to allow the excavation of gravel from four proposed high level diversion channel sites where tight bends are causing extensive and expensive river bank erosion and damage to flood protection assets.

### **Pohangina-Oroua River Control Scheme**

- 9.27. Both river systems experienced a significant flood event on 12 June with extensive damage being reported that will dominate the work programme over the coming year.
- 9.28. Staff are under pressure to commence this work immediately but are restricted on operations available to them during the current spawning period which restricts work in the river and the soon to commence dotterel breeding season that restricts access to the beaches. Temporary repair options are being investigated to stabilize the existing banks to limit further damage occurring until work can commence.
- 9.29. Initial feedback from landowners would indicate just under \$400,000 worth of damage over both schemes. A meeting with stakeholders is planned for August to discuss the extent of flood damage and the funding options available to implement the repair works.

### **Pohangina River**

- 9.30. The Pohangina River experienced a 10 year return period flood on 12 June with river levels rising to 4.2 m at the Mai's Reach hydrometric station. Initial inspections have identified 10 properties with significant river bank damage that will require repair once conditions allow.
- 9.31. Willow pole planting has commenced at a variety of sites in July.
- 9.32. Gravel extraction on the beach opposite the Ward property is due to commence shortly. A gravel build-up in recent years has forced the river flows hard against the right bank and Ward boundary causing ongoing erosion problems. The removal of this built-up gravel beach will widen the active channel reducing the river velocity and encouraging flow away from the recently installed bank protection works, giving them a better chance of long-term establishment.

### **Gravel Extraction**

- 9.33. A total of 10,000 m<sup>3</sup> has been extracted from the gravel beach opposite the Ward property on the Pohangina River during the reporting period.

### **Oroua River**

- 9.34. The Oroua River experienced a 50 year return period flood on 12 June with river levels rising to 4.4 m at the Almadale hydrometric station. Initial inspection has identified 15 properties with significant river bank damage that will require repair once conditions allow.
- 9.35. A lot of the existing river protection work completed in previous years has been damaged by this event and there are many areas of river frontage that will require extensive tree bank protection work in the form of rope and rail groynes, tied tree works and possibly some areas of rock work. As each day goes by more reports of damage have come in and currently staff are visiting farmers, recording damage and estimating repair costs.

**Gravel Extraction**

- 9.36. A total of 2,000 m<sup>3</sup> was extracted during the reporting period.

**Totara Reserve**

- 9.37. No works were undertaken during this reporting period.

**Upper Whanganui River Management Scheme**

- 9.38. The very successful willow plantings opposite Jileson's Quarry at Matapuna have been layered for the first time since establishment 12 years ago. In the future, they will probably be mulched but at the moment there is no digger mounted mulching unit between Whanganui and Taumarunui.
- 9.39. Tenders have been received for the repairs of the washed out left bank on the Pungapunga River just above its confluence with the Whanganui (the wash out is threatening a section of stopbank that is not a Horizons asset). This work is being undertaken for **Ruapehu District Council (RuDC)** and is fully funded by them.

**Taringamotu River Management Scheme**

- 9.40. A small residual budget sourced from reserves was spent on the TO Trust property on McLennan Road. High water levels in July 2017 eroded a 20 m x 6 m hole into which fell several large poplar trees. Their removal will be the last scheme work undertaken in the valley as the scheme was dissolved at the end of June.

**Matarawa Flood Control Scheme**

- 9.41. During June, channel clearance work was completed on the Kaukatea Stream. Two tree blockages were removed downstream of Dam 3.1 and Dam 3.2.
- 9.42. During July, dam & asset inspections were conducted. A work programme has been put together following these observations. No physical works undertaken in July.

**Matarawa Urban**

- 9.43. The last major work for the year was at 180 Ikitara Road where both sides of the river were cleared leaving a blockage free channel - perhaps for the first time in 50 years.
- 9.44. The work this year was selected on a priority basis with most of the bigger jobs now mostly completed.
- 9.45. Next year these locations will be linked by more minor tasks on the properties in-between.

**Tutaenui Flood Control Scheme**

- 9.46. Channel and dam inspections undertaken in mid-July will determine the work priorities for the coming years' maintenance programme.
- 9.47. Work to control an erosion bay at Christine Ramsey's property has now been completed and enhanced with the planting of approximately 200 willows along the right bank adjacent to the repair work. This work is fully funded by the landowner.

**Makirikiri Flood Control Scheme**

- 9.48. No work during the reporting period.
- 9.49. Staff visited Kirk Majors property on 26 May to see flooding downstream of the Scotts Road Bridge and where the Old Loop Channel was mechanically cleaned. The flooding was the result of congestion in the Old Loop Channel downstream of the Scotts Road Bridge, reinforcing the point that the Old Loop Channel needs to be mechanically cleaned to increase the flood capacity as recommended in the schemes' audit.

**Makirikiri Flood Egress Gate (June)**

- 9.50. It has been 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 and the following alterations are to be completed in August. A scribed rubber seal and additional hinges are being added to the structure for functionality.

**Porewa Flood Control Scheme**

- 9.51. During June, the Porewa Scheme maintenance budget was fully exhausted for the 2017-18 financial year in the month of June. The last piece of work conducted was channel clearance on the Onga Stream.
- 9.52. During July, dam & asset inspections were conducted. A work programme has been put together following these observations.

**Whangaehu Mangawhero River Management Scheme**

- 9.53. There have been no issues with the scheme over the reporting period.

**Turakina River Management Scheme**

- 9.54. A small willow clearing operation concluded the works programme at Drysdale Station.

**Lower Whanganui Vegetation Management and Flood Protection Programme**

- 9.55. A heavy rain event saw the river rise to 5.94 m on 19 June at the Pipiriki hydrometric site which is just below the 6.0 m Level 1 alarm.
- 9.56. Work by WDC to finalise repairs to the Karoro Road sewer is still progressing slowly. There is no further progress to report.

**Sailing Club Rock Lining (June and July)**

- 9.57. A rock lining has been constructed on the true right bank of the Whanganui River at the Sailing Club on Gilbert Street. Rock was sourced from the Waitahinga area. Approximately 200 tonnes of rock was placed in June with the following 165 tonnes placed in July. Work began at the downstream end where a rock lining has already been constructed. Rock will be used to fortify the current lining and to create a new rock wall upstream.

**Lower Whanganui River training works (June and July)**

- 9.58. The North Mole and South Spit Interface Wall investigations have been completed with design of both having commenced early July. Given the delays around an approach to central government for funding, a realistic target for the year end June 2019 is now the construction / repair of the South Spit Interface Wall, Tanae Groyne and to stockpile approximately 20% of the rock required for the North Mole strengthening. Physical works could be commenced early in 2019, in the event that consultation / consenting matters are able to be satisfactorily concluded and the balance of funding is confirmed by that time.
- 9.59. To that end:
- Investigation and surveying of the existing rock structure below and above water has been completed;
  - Wave height modelling and assessment for rock sizing calculations has been completed;
  - Design profile sketches for various batter treatment of the North Mole have been completed;
  - Development of concept 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 underway; and
- The identification of resource consent requirements is substantially completed.

9.60. Tasks that will be progressed over the next three months include:

- Finalising detailed designs and works scopes;
- Development of construction methodologies and estimates;
- Obtain firm expressions of interest for rock supply;
- 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;
- Development of draft consent applications; and
- Input as required to progress the Port Revitalisation and River Control Infrastructure Business Case to central government.

9.61. Concerns that have arisen are:

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

#### **Papaiti Road Vegetation Clearance (June)**

9.62. A consultation meeting was held on 24 May 2018 with the landowners affected by the proposed area. Positive feedback indicated that early consultation was beneficial. Work is programmed to be completed over summer 2018-19. No follow-up work has been conducted in June or July.

#### **Swim Spot Enhancement**

9.63. The overall winner of the 2018 Best Swim Spot was Cherry Grove on the Upper Whanganui in Taumarunui. An initial meeting with Ngati Haua was held on 1 July to help determine a suitable location for the enhancement, given the sensitivities that Iwi have around Cherry Grove.

#### **Pakihi Scheme**

9.64. Work for the year is now complete on this scheme.

#### **Forest Road Drainage Scheme**

9.65. Asset inspections are all complete. A weed blockage was cleared from the Road Drain and the drain through the forestry block was inspected after logging operations were completed. Overall, this drain was clear of any major blockages but nitrogen weed growth is now extensive following the removal of forestry cover highlighting the need for more regular cleaning in the future.

#### **Haunui Drainage Scheme**

9.66. Staff have been busy through June upgrading some of the scheme's drain access locations. Poor access with pugged and overgrown tracks has hampered efficient spray unit operations in the past highlighting the need for this work. Some minor mechanical clearing work was completed along the Haunui Road drain between Baberfelds and the Salisbury's property to ensure good drainage over the wetter winter months.

9.67. No work done in July, but asset inspections are due this month.

## Other Works

### Northern Annual Scheme Report (June and July)

- 9.68. 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 is now underway and planned for an end of August completion.

### Engineering Advice (June and July)

- 9.69. 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 and flood damage work.

## 10. EASTERN AREA

### General

- 10.1. The arrival of winter has seen a drop in temperatures and frequent periods of rain. Overall, the 2017-18 year has had less rainfall than the 2016-17 year, particularly in the Tararua ranges and the Waewaepa ranges, but the 2017-18 year has also been a year of short duration, high intensity rainfall events, which have resulted in notable flooding events on 14 July 2017, 9 March 2018 and 12 June 2018. The 12 June 2018 event was particularly felt in and around the Raikatea and Whangai ranges on the North Eastern edge of the Tararua district. This resulted in some roads being closed due to slips and flood waters from the Mangatoro River crossing Weber Road at Lys Road, and the Mangapuaka River crossing the Ormondville-Te Uri Road. Flows in the Manawatū River peaked for only a short duration but at the highest peak seen since the 2004 floods, with a stage height of 9.984 m at Weber Road Bridge.
- 10.2. The Makuri and Tiraumea Rivers recorded high levels, but stayed within their banks. There was no appreciable change in level for most of the rivers that comprised the South Eastern Ruahine Scheme, showing that the catchments for these streams sat within the rain shadow of the Ruahine ranges. The Akitio catchment experienced high rainfall, but not to the same degree as the March 18 event. The river was up in flow, but there were no issues to River Road or any properties bordering the river.
- 10.3. Damage was limited predominantly to assets in the Upper Manawatū stretches below Oringi, and was mostly associated with damage to PMUs and rope and rail groynes. Works have been planned for this financial year to effect repairs and this should be able to be met from the coming year's budget.
- 10.4. Staff have been undertaking those works associated with the end of financial year. The annual stock take was completed and the AMPs have been updated. Staff have also been out completing inspections and updating the AMS. Capitalisations are being completed as are work plans for the coming year with the finalisation of the new budgets.
- 10.5. Within this period, the Area Engineer completed the 2016-17 Annual Report for all Eastern Area schemes as well as a retrospective consent for a diversion on Cassel's Drain.
- 10.6. Requests for miscellaneous issues and engineering advice has continued over the last two months, with some of the issues raised being around flooding and flood damage in non-scheme areas; several gravel extraction requests from individuals and contractors; Clearing of congested stream channels; work with Higgins around proposals to raise the level of SH2 at the south entrance to Woodville, and various advice about the flooding issues associated with Sinclair's Drain adjacent to the Manga-atua River.

### **Tararua District River Management Scheme**

- 10.7. With the adoption of the 2018-2028 LTP, the Tararua River Management Scheme has become live. So far, work has been undertaken to bring the works programme together and to share and develop this with internal staff and other interested parties, to ensure good alignment. Liaison meetings have been held with the various Horizons teams, from Hydro to Freshwater, who may be affected by the plan of works, and with the Tararua Alliance.
- 10.8. Work has also been undertaken to:
- Review the legal status of works within the Tararua district – with regard to the One Plan and the Code of Practice for River Works to identify any gaps,
  - Start the process of gaining new consents for work programmes on new stretches of waterways,
  - Set up accounting structures for the financial reporting of the work.
- 10.9. Actual physical work has yet to begin. Staff are preparing an activity management plan for the new scheme with the plan intended to be presented to the October Catchment Operations Committee meeting.

### **Akitio Scheme**

- 10.10. The Akitio River scheme performed very well during the 9 June flooding event, with no damage being reported and River Road remaining open. The rainfall received in June was not as great as that seen in the event in March.
- 10.11. All physical work plans were completed in April 2018 and with the initiation of the Tararua District River Management Scheme, this will be the last lot of physical works completed for the Akitio Scheme. All new works to the Akitio River and surrounding catchments will be completed by the Tararua District River Management scheme.
- 10.12. As resolved by Council through the updated LTP, the Akitio Scheme has been frozen for a period of three years. Loans will be paid off and the remaining reserves will be held.

### **Eastern Manawatū Scheme**

- 10.13. Physical works on this scheme finished at the end of the last financial year and comprised aerial spraying. This scheme is now in the process of being wound up and any further physical works in the Eastern Manawatū area will be undertaken as part of the Tararua District River Management Scheme.
- 10.14. The process of winding up the scheme will involve the repayment of outstanding loan amounts, which are of equivalent value to the reserve and scheme balances, so that there should be very little in the way of funds remaining from this scheme.

### **Ihuraua Scheme**

- 10.15. A large amount of channel clearance work was completed during April, and this completed the works plan for the Ihuraua Scheme. This scheme is also in the process of being wound up, with responsibility transferring to the Tararua District River Management Scheme.
- 10.16. The scheme will finish with a balance of roughly \$4000, and a meeting is to be called with the Scheme Liaison Committee / community to talk about options for the dispersal of these funds.

### **Mangatainoka Scheme**

- 10.17. The last two months have been a rather quiet period for the Mangatainoka Scheme. A couple of contractors have been continuing with gravel extraction works in various spots,

and another has been delivering concrete for planned protection works this year. The concrete is coming from the demolition of the old Pahiatua rugby stand.

- 10.18. There have been a few instances of high water flow but the scheme is handling the volume of water well, with minimal damage and little channel overtopping.
- 10.19. Asset inspections have been carried out and this year's works plan is being compiled.

#### **South Eastern Ruahine Scheme**

- 10.20. Work has been focused on repair and maintenance activities in streams that do not have Schedule B values for spawning. This comprises the Manga-Atua, Rokaiwhana and upper Kumeti Streams and is focused around gravel control weir structures.
- 10.21. Works have also been undertaken on areas of flood damage from the March events, one of which has been on the Tamaki and involves repairs to a hydrological weir which also serves as protection from erosion for a bridge.
- 10.22. Various channel clearing activities have been undertaken on Government Drain and Sinclair's Drain to improve water flow through this area. Work has also been done to replace two culverts on a diversion line of Sinclair's Creek to allow water to flow through to the Manawatū more effectively. The results have been pleasing to date, with water freely flowing from the Government Drain to Sinclair's Creek and the Manga-Atua River during high rainfall events.
- 10.23. As of the end of financial year, all programmed flood damage works have been completed.
- 10.24. Work is being undertaken with the Tararua Alliance to repair a weir on Fairbrother Road, which is designed for gravel control and a road bridge. Asset inspections have been carried out and this year's works plan is under construction.

#### **Tawataia - Mangaone Scheme**

- 10.25. Very little has been done on this scheme since the last report, where general channel clearance activities had been completed.
- 10.26. The scheme ended the year slightly favourable to budget. Asset inspections have been carried out and this year's works plan is under construction. There is work to undertake in the new financial year that will involve some minor capital works as recommended by the Stantec report.

#### **Upper Manawatū – Lower Mangahao Scheme**

- 10.27. Work within this scheme has been focused on stock piling rock near proposed repair sites, though we are currently waiting for river levels to reduce before placing the rock on site.
- 10.28. Staff have met with Tararua Alliance staff to discuss protection works below the Homelands Road Bridge across the Manawatū River. The road is undermined now and requires rock work repairs within the riparian zone of the Manawatū River. Horizons and Tararua Alliance will be working together on this project with costs paid for by Tararua Alliance. Horizons will do some channel shaping at the schemes' cost.
- 10.29. The scheme ended the year favourable to budget, with the outstanding flood repair works for the last financial year completed under a drawdown from reserves carried over from the 2016-17 year. Asset inspections have been carried out and this year's works plan is under construction.
- 10.30. There is some damage to assets from the June flood events that will be picked up in the 2018-19 works programme and budget.

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**Environmental Grant Works and Engineering Advice**

- 10.31. While no further requests for environmental grant works have been made this period, three work sites have been completed and payments made. One applicant has chosen to cancel his approved work and a further two applicants have chosen to postpone their remedial work.

**11. SOUTHERN AREA****General**

- 11.1. Unsettled weather patterns have brought extended periods of rain over the last two months, keeping staff busy ensuring that the scheme pump stations and other assets are fully operational. Demand continues to be high from landowners keen to ensure that the parts of the drainage network that serve them are fully effective as we head through winter.
- 11.2. Staff have attended several meetings with representatives of software provider Adapt as the implementations of the Council's new AMIS commences. Staff have been busy completing scheme assets inspections and inputting the information into the asset management system.

**Ohau-Manakau Scheme**

- 11.3. The scheme was quite quiet this period with all programmed works completed. Winter is in full swing which has brought many higher flows through the main channels. The largest flows were: Ohau – 1.8 m (126.5 m<sup>3</sup>/s), Waikawa – 1.3 m (37 m<sup>3</sup>/s) and Manakau – 1.8 m (11 m<sup>3</sup>/s).
- 11.4. The mouth of the Waikawa Stream has been moving south since it was last mechanically cut in 2013. The stream has been eroding foredunes for some time and reprieve has been requested from a number of sources including HDC. While Horizons has the consent for the work to be done, the Ohau-Manakau Scheme has no mandate to carry out the work; Waikawa Beach residents are not rated for this service. Accordingly, the work has been progressed as an environment grant with HDC paying the balance of the cost (70%). The work was carried out on 29 June and has proved successful to date.
- 11.5. Work was carried out on the Manakau Stream between Takapu Road and Waikawa Beach Road to increase the channel capacity. Material was removed from the inside of the bends / berms. Trees that had fallen in the Kuku Main Drain were removed.

**Manawatū Drainage Scheme**

- 11.6. Burkes Gates were machine cleaned to remove the large build-up of weed that had formed at the gates.
- 11.7. Along a section of the Riddiford Wingate's Drain, where last year we had to remove a fence to enable access to the drain, we reinstated the fence.

**Makerua Drainage Scheme**

- 11.8. The high usage of Okuku Pump Station has meant large build-up of weed in front of the inlet screens, requiring a 12 tonne excavator to remove the built-up weed so that the pump station can operate.
- 11.9. A total of 5.6 km of scheme drains were mechanically machine cleaned this period. With two main drains cleaned being the Linton main and boundary drain due to a large build-up of weed.
- 11.10. Two slumps were repaired along the Old Main South Drain.

**Koputaroa Drainage Scheme**

11.11. The scheme was quiet this period with only minor maintenance at pump stations carried out including the pulling of weed from the inlet screens. A total of 1 km of drain was machine cleaned.

**Moutoa - Whirokino Drainage Scheme**

11.12. This period was quiet for the scheme with a lot of work done at pump stations the previous period. A total of 2.4 km of drain was machine cleaned.

**Te Kawau Drainage Scheme**

11.13. The top section of Sluggish Drain was machine cleaned to remove small slumps in the channel that were causing blockages.

11.14. A 300 m section of the Johnson’s extension along mill road was machine cleaned with the cleanings trucked away.

**Hokio Drainage Scheme**

11.15. A culvert was installed in McLeavey Road Drain to stop a fence from falling in. The landowner supplied the pipes and the scheme paid for the installation to reflect the benefit gained by both parties.

11.16. A section of Kohitere Drain was refurbished as part of the ongoing drain refurbishment. This section of drain is located at the back of 93 McLeavey Road. There are other sections of the drain that still require refurbishing, but due to the cost and budget constraints they are programmed for future years.

11.17. A section of Kohitere Drain, at the back of 207 McLeavey Road, was realigned and a culvert installed to keep stock out of the drain and assist with the maintenance of the drain in the future.

11.18. A 130 m length of pipe was installed into what will be an extension of midway drain. This section of drain will assist with drainage issues by diverting some of the water that would normally head down to Whelans Road through the high ground on the north side and back down to CD Farm Road. This will keep more water in the drain and minimise overland flow paths and flooding. This period saw the construction of the pipeline and if the next period has good weather, there will be the section of open drain constructed to link into the top end of midway drain.

**Foxton Drainage Scheme**

11.19. A short section of Kings Canal at the back of Foxton has been machine cleaned and several trees that had established along the edge of the canal removed to improve access to the canal for future maintenance.

**12. ENVIRONMENTAL GRANTS**

NAME	RIVER	DESCRIPTION	APPLICATION STATUS	ESTIMATED COST	EXPECTED SUBSIDY	WORK STATUS
Clinton	Aokautere	Removal of willow congestion	Approved	\$4,300	\$1,290	Yet to commence
A McKay	Kiwitea	R&R groynes	Approved	\$18,820	\$5,650	Completed
M Hoggard	Kiwitea	Bank protection	Approved	\$14,714	\$4,414	Completed

NAME	RIVER	DESCRIPTION	APPLICATION STATUS	ESTIMATED COST	EXPECTED SUBSIDY	WORK STATUS
V Larsen	Kiwitea Tributary	Bank protection	Approved	\$7,543	\$2,263	Completed
N Randall	Tutaenui	Groynes, rock, willow work	Approved	\$26,747	\$8,024	Scheduled
E Brook	Kiwitea	R&R groynes	Approved	\$6,111	\$1,833	Completed
J Carr	Tutaenui	Rock lining	Declined	\$20,000	\$6,000	Declined
C McConachy	Porewa Tributary	Rock lining	Approved	\$7,924	\$2,377	Completed
J Manning	Kiwitea	R&R groynes and tied tree works	Approved	\$19,702	\$5,911	Awaiting landowner decision
T Abraham	Waituna	Bank protection, willow planting	Approved	\$9,932	\$2,980	Completed
B Smith	Waimahoe	Grade control structure	Approved	\$2,500	\$750	Awaiting landowner decision
W Blakely & B Crawford	Porewa	Groynes, tree work, gravel work	Declined	\$44,092	\$13,228	Declined
R Redmayne	Mangatikotoko	PVC sheet piling, rock work	Approved	\$11,570	\$3,470	Scheduled
J McNaught	Mangatoro Stream	Removal of willow congestion and bank protection	Approved	\$10,000	\$3,000	Landowner has cancelled proposed work. No work undertaken.
L Thorby	Makairo Stream	Bank protection work and channel clearing	Approved	\$4,000	\$1,200	Work and payment completed.
Q Hooper-Smith	Mangatoro Stream	Rope and rail groyne bank protection work	Approved	\$8,000	\$2,400	Postponed until next financial year.
S Marsden	Mangahao River	Tree bank protection and mulching work	Approved	\$3,479.08	\$1,043.72	Work and payment completed.
G Bennett	Ohinemoa Stream	Bank protection work	Approved	\$23,691.20	\$7,107.36	Partially completed last financial year. This financial year's work and payment have been completed.

NAME	RIVER	DESCRIPTION	APPLICATION STATUS	ESTIMATED COST	EXPECTED SUBSIDY	WORK STATUS
D Dougherty	Mangaraupiu Stream	Bank protection work and channel clearing work.	Application postponed to next financial year.			
Hare	Kiwitea Stream		Application to be submitted			
Blakely	Porewa Stream		Application to be submitted			
Crawford	Porewa Stream		Application to be submitted			
Adams	Hautapu Stream		Application to be submitted			
Ford	Okehu Stream		Application to be submitted			
Lennox	Tutaenui Stream		Application to be submitted			
Murphy	Porewa Stream		Application to be submitted			
Buchanan	Kiwitea Stream		Application to be submitted			
HDC	Waikawa Mouth	Waikawa Mouth Realignment	Approved	\$10,000	\$3,000	Completed

### 13. SIGNIFICANCE

13.1. 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.