greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

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Committee	**Te Kāuru Upper Ruamahanga River Floodplain Management Plan Subcommittee**
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Te Kāuru Upper Ruamahanga Floodplain Management Plan - Options Development

1. Purpose

To update the Subcommittee about the development of options for flood risk management for Te Kāuru Upper Ruamahanga Floodplain Management Plan.

2. Background

Phase 2 of Te Kāuru Upper Ruamahanga Floodplain Management Plan involves developing options for flood risk management across the catchment.

Workshops have been held with the Subcommittee to focus on individual reaches of the rivers within the FMP catchment, discussing the issues facing these reaches and developing management approaches that may be appropriate.

These Subcommittee workshops have looked at the individual reaches of the Ruamahanga, Waingawa and Waipoua Rivers and the floodplain reaches of the Kopuaranga, Whangaehu and Taueru rivers.

Details of the workshops held to discuss the urban reach of the Waipoua, Gladstone to Kokotau Bridge reach of the Ruamahanga and the Eastern Hill Rivers have been presented in previous subcommittee reports.

The following sections of the report document the outcomes of the Subcommittee workshop looking at the remaining Ruamahanga reaches (1 to 8, excluding reach 7). While further work is required, we are seeking confirmation that the work to date has been accurately recorded and direction given on how to undertake further development.

Outcomes of the recent workshop held to discuss the Waingawa and Waipoua river rural reaches shall be reported at the next subcommittee meeting.

3. Design Fairways and Buffer Strips

To begin the workshop, river engineering consultant Gary Williams provided an overview of the design of fairways and buffer strips referring to examples along the Ruamahanga to explain some of the processes. Key points he covered were;

- The need to determine what the natural form of the river is
- Rivers are dynamic and like to maintain themselves in a particular way
- Once rivers move out from gorges and on to the flood plains they tend to move around
- Aim of river management is to work with the character of the river; rivers migrate and the aim is to accommodate this
- Repeat aerial photography along a river is an important management tool; showing changes over time and the pattern of changes
- Design channel and buffer zones allow rivers to move, within a defined width. It's important to decide on a suitable channel form, channel width and buffer width
- The buffer zone helps to absorb the energy of a flood activity and is sacrificial. With reinstatement carried out to reintroduce vegetation once erosive pressure is relieved
- Vegetation buffer zones are used widely in New Zealand, unlike in many other countries where the channel is fixed in a constructed channel. The buffer zone approach works best where the river is shallow and wide.
- The character of the river changes from reach to reach so management needs to consider management reach by reach
- The character of the Ruamahanga River varies – narrow in gorges and semi braided and braided once on the plain
- Design lines need to be applied as guidelines as there needs to be a degree of flexibility. This needs to be articulated clearly when describing the aim of the design lines.

4. Ruamahanga River

The Subcommittee discussed a number of ideas for managing the Ruamahanga River in order to address the known issues and achieve the draft vision and aims of the floodplain management plan. These design ideas are described below.

4.1 General Design Philosophies

There are a number of general principles that could be adopted to manage the flood risk and river management issues across the floodplain. In reality, aspects of a number of these will be pulled together to provide a package of

measures that can achieve the vision and aims of the FMP specific to each reach.

A number of design philosophies were detailed in the last options development report presented to the Subcommittee and were again discussed and talked around as part of the recent workshop held looking at the Ruamahanga River reaches. Below is a summary of each;

4.1.1 Design philosophy 1

To maintain the status quo and current level of service within the reach.

Key Tools

- Design fairway (current, unmodified).
- Existing flood control bunds.
- District plan controls.

4.1.2 Design philosophy 2

To maintain the current level of service to the reach but aim to reduce the need for remedial works by creating more substantial continuous willow buffer areas, with the aim of reducing cost of ongoing maintenance.

Key Tools

- Design fairways with wider buffer areas, same river channel area.
- Additional planted buffer area (natives and willows).

4.1.3 Design philosophy 3

To lower the level of service within the reach and allow more space for the river to migrate its channel, by increasing the widths of the design fairways and allowing more erosion to occur to adjacent land. Existing habitable structures and higher value infrastructure (access roads, sheds, pipelines etc.) would be protected.

Key Tools

- Design fairways with wider river channel areas and same width buffer areas.
- Additional planted buffer area (natives and willows).

4.1.4 Design philosophy 4

To lower level of service by abandoning flood protection assets that are of low importance or of low quality.

4.1.5 Design philosophy 5

Increase the level of service through strengthening of flood protection assets to provide increased flood protection for adjacent land.

Key Tools

- Construction and strengthening of stopbanks around productive land to reduce incidence of flooding.
- Increased erosion protection to protect flood protection assets.

4.1.6 Design philosophy 6

Establish pool, riffle and run counts for the reach to encourage habitat diversity and restoration of Mauri to the river.

Key Tools

- Definition of a pool, riffle and run count for reach that can be implemented as part of any erosion repair or channel modification works.

4.1.7 Design philosophy 7

Re define district plan controls to include consideration of river corridor, erosion, overflow, ponding and residual hazards. (Current district plan contains flooding, extra flood hazard and erosion).

Key Tools

- District Plan.

4.1.8 Design philosophy 8

Create and plant areas of suitable native species adjacent to the river channel.

Key Tools

- Native planting plans.
- Maintenance and repair works.
- Code of practice.
- Community groups.

4.1.9 Design philosophy 9

Prepare emergency plans for critical services and/key locations to ensure that adequate provision is made to manage emergency situations.

Key Tools

- Education and awareness
- WREMO
- Plans.

4.2 Workshop Outcomes

4.2.1 General

The following sections set out a general direction that can be taken to develop a particular option combination for each of the reaches looked at during the recent workshop.

The output of this workshop is not a final product but will assist in progressing through the development phase required to identify a complete package of measures.

A description of the 7 Raumahanga Reaches, discussed during the workshop, and the design options being considered is contained in Attachment 1 to this report.

4.2.2 Erosion Protection

The level of service for the reach is to provide a five year return period flood event level of erosion protection, for land behind the buffer line, within an agreed design fairway and buffer zone.

Erosion damage reinstatement for events greater than a 5 year return period and less than a 25 year return period flood would be funded through scheme reserves with an inclusion in the decision process allowing for consideration of non-reinstatement if the costs were to be prohibitive.

In a greater than 25 year return period event repair or reinstatement will be considered on a case by case basis dependant on level of damage, any course change within the river and affordability or availability of funds.

4.2.3 Flood Protection

Land in the rural areas adjacent to the Ruamahanga flood regularly and a flooding level of service has therefore not been set for each reach. However, consideration of habitable floor heights with respect to evacuation and emergency planning will be a requirement to ensure reduction of risk to life for occupants of these properties. The flood warning system should continue and be reviewed for improvement potential.

4.2.4 Gravel Management/Gravel extraction

More investigation and monitoring should be carried out to better understand the issues and implications specific to particular reaches of the river in order to develop improved management practices, supplemented by supporting guidance material.

4.2.5 Ecology

The approach includes the incorporation of opportunities to build on the natural environment and improve the mauri of the waterway that will be assisted with the potential development of a pool, riffle, run 'envelope' target, and by encouraging the development and use of reserve areas with good development potential, such as at the Tirohinga reserve, directly downstream of double bridges.

4.2.6 Current Assets

The function of several assets within the various reaches will be more clearly defined to assist with appropriate management of the flooding and erosion risks. This will focus on the various 'rural stopbanks' identified which appear to provide limited protection value.

The Rathkeale stopbank in particular should be investigated and options to relocate the stopbank away from edge of the river explored.

There are sections of rural stopbank in the various reaches that are situated within the buffer zone, or even the design channel. A strategy needs to be developed for specific locations to identify mitigation measures. In some instances this may lead to proposals to relocate stopbanks outside of the

fairways other cases may require the lowering the level of service for a particular asset and leaving it where it is.

Willow planting in buffers will continue and methods explored to ensure continuous belts of vegetated buffers (see funding section below). A programme for the transition away from use of crack willows will be initiated.

4.2.7 Design Fairways

The use of a design fairway as a management tool should be continued and this will be modified in areas where there have been ongoing observed or known management issues.

To better communicate and raise awareness of the risks associated with large floods, an additional line will be added to the design fairways to indicate the maximum photographed or known historic extent of the river channel. This will aid with understanding of possible course changes that could occur as the result of very large flood events.

A guidance document should be developed to clearly describe the concept of design fairways, how they are developed and how expected to function in a particular area. It should assist with operational management and aid understanding around the level of service provided to affected land owners.

4.2.8 Funding Structure

The funding structure will be clarified to better define the decision process when addressing works and if/how these are funded in relation to the size of event(s) which caused the damage, and if these are then funded by individuals, rates, reserves or some form of disaster relief fund.

Recognition of planted buffers as an erosion risk management tool will be quantified and more formally recognised within a revised rating structure. Opportunities to look at alternate uses of these land areas to generate additional revenue streams and broader community economic gain will be encouraged.

4.2.9 Land Use

Zoning recommendations that better define the nature of hazards will be developed and recommendations will be made to include these as part of a future plan change. Recommendations will explore the use of different hazard categories that define the type and degree of the hazard.

5. Future option development process

It is proposed that the project team undertakes analysis of the options and further investigation of the issues raised to develop appropriate options combinations. These option combinations will then be presented to the Subcommittee at future meetings for their discussion, review and refinement.

6. The decision-making process and significance

No decision is being sought in this report.

6.1 Engagement

Engagement on this matter is unnecessary.

7. Recommendations

That the Subcommittee:

1. ***Receives** the report.*
2. ***Notes** the content of the report.*
3. ***Confirms** the outline options presented in this report reflect the Subcommittee's understanding of the option development to date.*

Report prepared by:	Report approved by:	Report approved by:	Report approved by:
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Attachment 1: Reach summaries