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REGIONAL COUNCIL

Wairarapa Peer Review

2004/05

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1. Introduction

Annual peer reviews are undertaken of assets on rivers in both the Western and Wairarapa Regions. The peer reviews provide an audit of maintenance standards and procedures, and are an essential component of each department's asset management systems.

This year's inspection visited sites on the Waiorongomai and Ruamahanga Rivers on the Lower Wairarapa Valley Development Scheme, and the Waiohine River.

Inspected by: Jeff Evans, Mike Jensen, and Jacky Cox of Flood Protection, Landcare Division.

Guides: Michael Hewison, Ranjan Cyril, Mike Longworth, Graham Reidy, and Dion Rewiti of the Land & River Operations Department, Wairarapa Division.

Inspection date: 14 July 2005

2. Lower Wairarapa valley development scheme (LWVDS)

The Lower Wairarapa Valley Development Scheme covers the section of the Ruamahanga River from the Waiohine confluence downstream to the Lake Onoke outlet into Palliser Bay; the Tauherenikau River from the Rail Bridge downstream to Lake Wairarapa, and all the eastern and western tributary streams.

This year, sites visited focused on the Waiorongomai and Ruamahanga Rivers.

2.1 Waiorongomai River

Prior to the October 2003 flood event, the Waiorongomai River required little or no ongoing maintenance and was in a reasonably stable state with well vegetated berms. As a consequence of a number of flood events since October 2003, the river channel widen considerably, lateral erosion was accelerated, and due to the huge volume of gravel moving through the system the behaviour of the stream is now unpredictable.

To protect the road and maintain the river in an ideal alignment a series of retards (driven railway iron and timber wale construction) were constructed both upstream and downstream of the road bridge. On one of the more critical bends, approximately 500 tonne of rock was placed to prevent the stream changing course and outflanking the road bridge. A major willow planting programme will be completed this planting season.

Picture 1: Retards on the Wairongomai Stream

The reviewers consider the works appropriate for the situation, and endorse the planting of the site with willows this planting season. An ongoing maintenance programme will need to be developed to ensure that the retards and proposed planting are kept in a good condition.

2.2 Scadden stopbank

The relocation of the Scadden stopbank was in direct response to erosion and slumping encountered during the February and August 2004 flood events when the old combined stopbank and concrete wall was close to failure.

The stopbank work required resource consent to:

- Relocate the 300 metre section of stopbank adjacent to the Ruamahanga River.
- Lower the ground level on the river side of the stopbank by creating a low level bench to be planted with willows.

Due to delays in the resource consent process, the stopbank and concrete wall continued to deteriorate. The August 2004 flood event created an emergency situation, and a decision was made in September 2004 to construct the new stopbank under the emergency provisions of the RMA. A resource consent was granted to do the remaining work, including the removal of the old stopbank and concrete wall, however this has been appealed. This work will be completed when resource consent is granted by the Environment Court.

Picture 2: Scadden stopbank

The reviewers agreed with the urgent need to relocate and replace the existing stopbank and concrete wall structure with the new stopbank (see picture 2). The remaining works should be constructed as soon as resource consent is granted to ensure the area on the river side of the stopbank is suitably protected.

The condition of the new stopbank was good, with adequate grass cover and no evidence of overgrazing.

2.3 Boulder groynes

Downstream of the Scadden stopbank, on a large sweeping bend of the Ruamahanga River, a series of equally spaced 300 tonnes boulder groynes have been constructed; these groynes fix the bank edge to prevent further slumping.

The groynes are constructed from boulders sourced from the Waiohine River, and extend from the top of the bank edge to the depth of the thalweg.

Picture 3: boulder groynes

The reviewers were impressed with the application of a fairly standard method of edge protection to this unusual situation. The boulder groynes are cost effective, and are working extremely well.

The groynes were in good condition with a suitable batter slope and no evidence of slumping. The reviewers recommend the planting and ongoing establishment of willows to enhance the stability of this site.

2.4 Guscott and Shelton properties

The Guscott and Shelton properties are located adjacent to the Ruamahanga River, downstream of the Waiohine River confluence. Both properties have substantial river frontages, with river flats vulnerable to flooding.

On both properties the landowners have constructed low-level sill banks; these banks are designed to overtop in large flood events but provide protection from inundation in smaller flood events. During the February 2004 flood event, the Ruamahanga River breached both low-level sill banks, cutting off meanders and severely eroding the bank edge in both locations.

To repair the lateral erosion and maintain the design channel alignment through the Guscott's property, the left berm on the outside of the bend was rebuilt with gravels from the right bank. Then approximately 1,200 tonne of rock was delivered to site and used to construct six small evenly spaced rock groynes; if required a seventh downstream groyne may be constructed in the future.

Upstream at the Shelton property, 3,000 tonne of rock was used to construct similar works; these works were not inspected due to time constraints.

Picture 4: Series of rock groynes on the Guscott's property

The reviewers consider the approach and solution taken appropriate for both situations, especially given the extremely difficult access to both sites. It is important that the river, through these two properties, is maintained in a suitable channel alignment to

prevent channel instabilities upstream and downstream, and the newly constructed works will achieve this.

The reviewers believe the alignment of the rock groynes appropriate, and note that as well as mass planting the newly constructed works with willows during this planting season that the existing willow stand upstream of these works is also reinforced. The gravel beach on the right bank should also be monitored to ensure that the new works are not put under additional pressure.

3. Waiohine River Scheme

The Waiohine River has a relatively long and narrow catchment area of 378 km^2 on the eastern side of the Tararua Ranges. From its headwaters at an elevation of 1,500 m, the river flows out onto the alluvial gravel deposits of the Wairarapa plains over a distance of 20 km to its confluence with the Ruamahanga River. On the Wairarapa plains the Waiohine River is joined by one major tributary, the Mangatarere, which has a catchment of 90 km^2 in the Tararua foothills.

3.1 Bicknell property

The Bicknell farm is situated in a flood prone area and is subject to flooding in a greater than 2 year event. A number of years ago, the river channel at this point had noticeably widened, causing erosion to upstream properties and the destruction of existing flood protection works. To rectify this, a series of new works were constructed to re-establish the original protection, including:

- Construction of a series of rock groynes with planting in between to provide suitable bank protection.
- Construction of a low-level sill bank to re-establish the existing bank edge levels.
- Installation of a floodgate from the Muhunoa Stream with construction of a rock apron at the outfall and placement of boulders at the toe of the bank for protection.

This site was visited two years ago by the reviewers who were impressed at that time with the works constructed in this area to re-establish protection for the landowner. Through the intervening two years this protection has only increased through progressively working towards the design channel alignment, and providing a consistent channel width for the river.

The condition of the low-level sill bank and bank edge protection works was good. The reviewers note that the area behind the rock groynes should be interplanted with willows to reinforce the existing willow line.

3.2 Wong Property

In 2000, the outer bend on the right bank of the Waiohine River was severely eroded almost back to the stopbank. To repair the erosion and rebuild the right berm, gravel was moved from left to the right bank. This was then shaped to provide a 15 metre berm area and a natural batter slope. The berm was then planted with rooted willows, and the

batter slope armoured with 2,500 tonnes of large boulders sourced from the upper Waiohine River.

The large gravel beach on the inside of the bend is also regularly extracted.

The reviewers also visited this site two years ago. The condition of the armouring layer over the intervening two years is comparable; however the reviewers note the following concerns:

- *The scour occurring at the backside of the armouring, which was noted during the last inspection is still continuing and should be monitored to ensure that it does not jeopardise the integrity of the work.*

- *There are some depressions in the toe of the armouring layer; this may indicate potential failure spots and should be monitored closely.*

- *The left bank gravel beach requires monitoring to ensure the works are not placed under additional pressure.*

Picture 5: Boulder armouring layer.

3.3 Woodside

Woodside is situated in the upper reaches of the Waiohine River near the water intake for Greytown and Featherston. The reviewers were shown how certain reaches of this river are managed almost entirely by working towards the design channel alignment through willow plantings, and in channel gravel management; specifically the use of pilot cuts and crossblading.

By providing the Waiohine River with a consistent width, removing constrictions, building berm areas up through planting, and taking the pressure off vulnerable bank edges, the river is staying within the confines of its design alignment.

To demonstrate how successful this approach has been, the reviewers were shown a number of successive years of aerial photography.


Picture 6: Looking upstream and downstream of a pilot cut on the Waiohine River

4. Summary

As with past peer reviews the sites chosen are only a snapshot of the schemes managed by the Land & River Operations Department but are selected on the basis that they are reasonably representative of each of the schemes as a whole.

Six sites where visited this year, four were new works constructed after either the February 2004, August 2004 or October 2004 flood events; the remaining two sites have been inspected in the past, allowing comparisons to be drawn.

As has been noted by reviewers in the past, the approach taken in many situations by Land & River Operations Department staff is innovative and done with foresight, often as a direct result of budget constraints.

The reviewers are confident that the schemes within the Wairarapa Region are being managed and maintained appropriately given the resources available.

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