



Attachment 8 to Report 06.441

# Wairarapa Peer Review 2005/06

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**Appendix – Aerial photography of sites visited**

## 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 a number of schemes including: the Waipoua River Scheme, Waingawa River Scheme, and the Upper Ruamahanga River Scheme.

**Inspected by:** John Eyles, Mike Jensen, and Jacky Cox of the Flood Protection Department, Catchment Management Division.

**Guides:** Ranjan Cyril, Ian Gunn, Maia Kawana, Mike Longworth, Graham Reidy, Deon Rewiti of the Flood Protection Department, Catchment Management Division.

**Inspection date:** 18 August 2006.

## 2. Waipoua River Scheme

The Waipoua River Scheme covers an 18 km length of the Waipoua River channel from the Mikimiki Bridge to the Ruamahanga River confluence. The Scheme was established in 1954 and provides protection to 770 hectares of rural land, which includes urban Masterton.

The goal of the scheme is *“To manage the Waipoua River and flood mitigation system, providing an agreed Scheme standard of protection to riverside property, whilst maintaining and enhancing environmental and recreational values”*.<sup>1</sup>

### 2.1 Mahunga Golf Course

At this location, an S bend of the Waipoua River was originally protected through a series of debris fences constructed on the right bank (adjacent to the Daniel's property), and longitudinal tethered willows on the left bank (adjacent to the Golf Course). These works were outflanked in the February 2004 flood event, and both the right and left bank edges suffered severe lateral erosion.

To repair the damage through this reach, the river channel has been realigned to the design channel alignment, and a series of rock and boulder groynes constructed on both the right and left banks. On the right bank, eight boulder groynes (three with rock heads) have been constructed; there are plans this financial year to add debris fences to these groynes to further maintain the design channel alignment. On the left bank, there are three rock and three boulder groynes. A small boulder groyne was lost from the downstream end of these works and cable willows are also proposed this financial year.

The total cost of the work was \$66,000.00, and was funded by the Golf Course, the adjacent landowner and the Scheme.

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<sup>1</sup> Pg 2 Waipoua River Management Scheme Asset Management Plan  
WGN\_DOCS-#368881-V1



Photo 1: Boulder groynes adjacent to Daniel's property

*The reviewers' noted damage to willow poles from a recent flood event and from stock. The reviewers' recommend the addition of netlon sleeves to the willow poles to reduce the degree of debarking during a flood event and also recommend that the landowner is requested to fence the works off from stock. The area should be interplanted to replace the damaged willow poles once the fencing is complete.*

*A constriction exists at the downstream end of the works and the reviewers' support the proposed willow removal planned for this financial year.*

## **2.2 Gold's property**

The Waipoua River, through the Gold's property, takes quite an abrupt left hand bend; this bend has had ongoing alignment issues and a stopbank was at risk from lateral erosion.

To protect the newly relocated right bank stopbank, the river was realigned to the design channel alignment. To maintain the alignment through this reach a series of rock groynes were constructed on the left bank.

On the left hand bend, a series of boulder and gravel groynes were constructed on the right bank, and then mass planted with willow poles to slow velocities. Downstream of these groynes, a toe rockline lined with boulders imported from the upper reaches of the Waingawa River was constructed. The rockline was required due to the proximity of the bank edge to the stopbank, and the need to protect this asset. Downstream of this rockline a further series of boulder groynes have also been constructed.



Photo 2: Boulder and gravel groynes. Note lateral bank edge erosion & large gravel beach.

*Overall the reviewers' agree with the works constructed to hold the river in the desired alignment, and note that the works had passed recent flood events with little or no damage.*

*Two points of concern were noted:*

- *Lateral erosion downstream of the rockline is occurring, and the reviewers' recommend that some small snub groynes are constructed to flick the river out from the bank edge.*
- *A large gravel beach has built up on the inside of the bend and the reviewers' recommend that this beach is extracted to ease the pressure to the left bank.*

### **2.3 Buick's property**

In the early 90s the Waipoua River started to erode the bank edge of the Buick's property. This erosion steadily increased, and over time there was a real threat that the river could drop into an old meander.

To repair the erosion and prevent the river dropping into the old channel, the river was realigned and the area then mass planted with willow poles. To maintain the alignment and provide the plantings with some protection, two hay barn pole and wire debris fence structures approximately 20 m in length were constructed upstream of each planting area.



Photo 3: Lateral erosion at Buick property, newly planted willow poles.

*The reviewers' note that the hay barn pole and wire debris fences, used as an alternative to the traditional rail iron and wire debris fences due to financial constraints, are performing well. The willows are successfully established.*

*Alan Buick, Chairman of the Waipoua Scheme, was present for the review. He commented that he was "happy with the overall scheme performance during the recent floods".*

### **3. Waingawa River Scheme**

The Waingawa River Scheme covers a 16 km river channel length from the Atiwhakatu Stream to the Ruamahanga River confluence. The scheme was established in 1992 with a planned 15 year development programme of infrastructural assets that is nearing completion. This had seen a shift from establishing assets to maintaining them.

The goal of the scheme is *"To manage the Waingawa River and flood mitigation system, providing an agreed Scheme standard of protection to riverside property, whilst maintaining and enhancing environmental and recreational values"*.<sup>2</sup>

#### **3.1 Davidson's property**

Although not a recently constructed work, the reviewers inspected this site due to the proximity of the Waingawa River to Masterton District Council's main water supply. This site is vulnerable to lateral erosion and requires monitoring to ensure that Masterton's water supply is not under threat as was the case in a 2000 flood event. The river, at this point, had severely eroded the left bank edge and was approximately 2 metres from the water supply pipe. To remedy this, the river was realigned and rock padded against the rebuilt bank edge.



*Given the aggressive nature of the Waingawa River, the works are in good condition and are performing well with the development of a well vegetated buffer zone immediately adjacent to the river.*

### **3.2 Hyde's property**

At this location of the Waingawa River is quite braided and difficult to manage. To repair the eroded bank edge a series of ten shingle groynes have been constructed from onsite material over a bank edge length of approximately 1 km. The area between the groynes has been mass planted with willow poles.



Photo 4: Shingle groynes & willow plantings.

*The reviewers agree with the approach taken in this situation and believe that the shingle groynes will provide adequate bank edge protection to allow the establishment of a well vegetated buffer zone. The reviewers' note that future interplanting of willow poles will be required.*

## **4. Upper Ruamahanga River Scheme**

The Upper Ruamahanga River Scheme includes the 58 km length of the Ruamahanga River channel from the Waiohine River confluence to 4 km below the SH2 Bridge at Mt Bruce. The Scheme was established in 1982, has a total catchment area of 156 hectares, and provides protection to 2,762 hectares of rural land. In 2002 the Scheme was separated into three separate Schemes with varying levels of funding and protection to better reflect the land owners' needs.

The goal of the schemes are *“To manage the Upper Ruamahanga River and flood mitigation system, providing an agreed Scheme standard of protection to riverside property, whilst maintaining and enhancing environmental and recreational values”*.<sup>3</sup>

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<sup>3</sup> Pg 2 Upper Ruamahanga River Management Scheme Asset Management Plan  
WGN\_DOCS-#368881-V1

## 4.1 Henley Lake

Immediately adjacent to the Henley Lakes, the Ruamahanga River takes a large sweeping right hand bend. Following the February 2004 flood event, the five rock groynes constructed in 2000 suffered damage. To rectify this damage, the existing groynes were topped up, the bank edge reinforced with boulders, and a further three groynes were constructed downstream of the existing works.



Photo 5: Looking upstream and downstream at boulder and shingle groynes.

*With the works only constructed in March of this year they are still very vulnerable, and will continue to be, until the area is stabilised through plantings. A large gravel beach has built up on the inside of the bend and the reviewers' recommend that this beach is extracted to ease the pressure on the newly constructed works.*

*The existing groynes, which were recently topped up, were in good condition but the newly constructed groynes require some attention. There is erosion evident between the groynes and the groynes themselves show signs of slumping. The reviewers' recommend that the size and spacing of these groynes is investigated.*

## 4.2 Te Ore Ore grade control weir

The reviewers were shown the failing Te Ore Ore grade control weir in the hopes that some solutions may be offered. The timber and iron grade control weir was constructed a number of years ago to protect the former road bridge, which was being undermined; this bridge has since been replaced and the current road bridge is not at risk from degradation.

The weir has been progressively failing over a number of years but has not been removed for two reasons:

1. Gravel is commercially extracted upstream of the weir.
2. Approximately 1 km upstream of the weir, is the intake for the Henley Lakes; this intake is vulnerable to fluctuations in riverbed levels.





Photo 6: The failed Te Ore Ore grade control weir.

*The reviewers' could not offer a solution but asked a number of questions:*

- *Is the weir actually required?*
- *Could the weir be repaired in-situ?*
- *If the weir was removed, what impact would this have on the river overall?*

*The reviewers' recommend a study of this reach is commissioned to provide answers to the above questions.*

#### **4.3 MDC ex Forbes**

At this location, the Ruamahanga River is immediately adjacent to Masterton District Council's sewage treatment plant, in particular the oxidation ponds. In 2000, the right bank edge was severely eroded and a stopbank lost. The stopbank has since been relocated but the bank edge was eroded again in the February 2004 flood event. To repair the erosion and rebuild the right berm, gravel was moved from the left to the right bank, rail and pole debris fences were constructed, and the area mass planted with willow poles.



Photo 7: Reconstructed with debris fences and willow plantings

*The reviewers' recommend that:*

- *The channel alignment is monitored.*
- *The left bank erosion upstream of the works at the change over point is investigated.*
- *That the gravel beach downstream of the works is investigated.*

## **5. Summary**

As with past peer reviews the sites chosen are only a snapshot of the schemes managed but are selected on the basis that they are reasonably representative of each of the schemes as a whole. Eight sites on the Waipoua River Scheme, Waingawa River Scheme, and the Upper Ruamahanga River Scheme were visited this year.

As has been noted by reviewers in the past, the approach taken in many situations by Flood Protection staff is innovative and done with foresight, often limited by 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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