

**Construct rip-rap**

**Waikanae Global consent - Rock riprap lengths, tonnage and location**

Year	Amount (tonnes)	Length (m)	Location	Cross section
1999/2000	58	50	Large boulder rock line at Gas Line and El Rancho	
May-06	200	20	Build toe rockline upstream of Maple Lane No 2 rock groyne	340 - 410 R
Feb-07	40		Build rock return Maple Lane	
Feb-07	40		Build rock return Jim Cook Park	
Feb-07	40		Build rock return Jim Cook Park culvert	
Dec-07	180		Kebbels rock return and groyne topup	350 R
Oct-08			Rock return	345 R
Feb-09	2,400	190	Otaihanga rock wall	60 - 70
<b>Total</b>	<b>2,958</b>			
<b>Ave/year</b>	<b>211</b>			

**Maintain rip-rap**

**Waikanae Global consent - Rock riprap lengths, tonnage and location**

Year	Amount (tonnes)	Length (m)	Location	Cross section
2000/2001	420	83	Raise Kebbels rock line by 1 metre	
2002/2003	20		Kebbels rock line LB - top up slump	
Feb-03	20		Kebbels rock line LB - top up slump	350 - 360 L
May-06	50		Kebbels rock line LB - top up slump	350 - 360 L
May-06	150		Edgewater Park rock line LB - top up slump	380 - 390 L
Jan-08			Rebuild rock return Maple Lane	340
Dec-12			Top up rock end of Otaihanga rock wall	
<b>Total</b>	<b>660</b>			
<b>Ave/year</b>	<b>47</b>			

**Maintain grade control structure**

**Waikanae Global consent - Rock riprap lengths, tonnage and location**

Year	Amount (tonnes)	Length (m)	Location	Cross section
2000/2001	815		Widen Kebbels weir by 8 metres	
2002/2003	100		Kebbels Weir RB - extend right bank rock abutment	
Feb-03	100		Kebbels Weir RB - build out right bank shoulder	350 R
May-06	200	15	Kebbels Weir LB - extend left bank rock abutment	350 R
May-06	530		Kebbels Weir LB - re-build top of weir	350 R
Feb-07			Kebbels Weir LB - Top up weir fill holes	350 R
Jan-08			Rebuild rock weir Kebbels corner	350 R
<b>Total</b>	<b>1,745</b>			
<b>Ave/year</b>	<b>125</b>			

**Maintain rock groyne**

**Waikanae Global consent - groyne tonnage and location**

Year	Amount (tonnes)	Number	Location	Cross section
1998/199	851		Rebuild 3 x groynes at Sunny Glen	
1998/199	636		Rebuild 3 x groynes at Maple Lane	
2000/2001	82		Topup Groynes at Sunny Glen and Maple Lane	
2001/2002	101		Topup Groynes at Sunny Glen and Maple Lane	
Feb-05			Retrieve rock from channel for re-building rock groynes and walls - both banks	300 - 410
May-05	260		Flood Damage Repairs - Maple Lane Rock Groynes - recover rock & re-build	340 - 345 R
May-05	530		Flood Damage Repairs - Sunny Glen Rock Groynes - recover rock & re-build	390 - 410 R
May-05	100		Flood Damage Repairs - Waikanae Mouth - Training Groyne Rock Placement	10 L
Feb-06	259		Maple Lane RB - re-build noses of groynes 1, 3, 4; extend & re-build nose of groyne 2	0340 - 0350
May-06	530		Flood Damage Repairs - Sunny Glen Rock Groynes & toe-rock line - add rock & re-build	390 - 410 R
Feb-07	60		Kebbels rock Groyne rebuild nose	0350 - 0360 L
Dec-07	180		Kebbels rock return and groyne topup	0350 R
Nov-09	90		Topup Groynes	XS400-XS410
<b>Total</b>	<b>3,679</b>			
<b>Ave/year</b>	<b>263</b>			

**Install strengthen vegetation  
Waikanae Global consent - Material quantity and location**

Year	Material Quantity	Length (m)	Location	Cross section
1998/99		100	Layer Willows Greenaway Road	
2000/2001	46 blocks	50	Tethered willows at Jim Cook Park	
2001/2002	8 blocks	8	Tethered willows at Nimmo Ave east LB	
2002/2003		200	Jim Cooke Park LB - strengthen willows	
2002/2003	52 blocks, 90 poles	80	Neale's RB - Cable in concrete blocks, plant willow poles	300
Apr-04	69 blocks, 300 m cable		1 - Falconers LB - divert channel, install bank edge protection	250 R
Apr-04	90 poles		2 - Falconers LB - install double rows of cabled concrete blocks & willow poles	310 L
Feb-05	25 blocks, 50 m cable	30	1 - Falconers RB - divert channel, install bank edge protection	310 L
Feb-05	80 poles		2 - Falconers RB - install double rows of cabled concrete blocks & willow poles	310 R
Feb-05	90 blocks, 120 m cable	120	1 - McIntyres RB - divert channel, install bank edge protection	310 R
Feb-05	120 poles		2 - McIntyres RB - install double rows of cabled concrete blocks & willow poles	230 - 240 R
Feb-05	25 blocks, 30 m cable	50	1 - Greenaway Road LB - divert channel, install bank edge protection	230 - 240 R
Feb-05	50 poles		2 - Greenaway Road LB - install double rows of cabled concrete blocks & willow poles	200 L
May-05	42 blocks	30	Flood Damage Repairs - below SH bridge LB - install double row of concrete blocks	420 L
Feb-11		60	Tether willows	110-120
		<b>Total</b>		<b>728</b>
		<b>Ave/year</b>		<b>52</b>

Willow numbers		Poles	Stakes
Year			
1998		195	
1999		268	850
2000		0	
2001		20	50
2002		90	200
2003		580	70
2004		277	60
2005		60	
2006		200	
2007		440	
2008		220	
2009		0	
2010		70	
2011		651	
	<b>Total</b>	<b>3071</b>	<b>1230</b>
	<b>Ave/year</b>	<b>219</b>	<b>88</b>

Right bank (km)	Left Bank (km)
3.857	3.559
55%	51%

Willow length

Percentage of scheme length\*

\* scheme length is 14 km. 7km per bank

Record of crossblading activities in the Waikanae River - Consent WGN 980256

Year	Month	Location	X Section	Length (m)	Reach	Comment
2012	January	Beach recontouring	220 L	50	Waikanae River	Total 2011-12 Maintenance
				0		Total 2010-11
				none		
2010	February	Channel realignment	220 R	100	Waikanae River	Total 2009-10 Maintenance
2009	March	Cleared bank to the right channel width	440	150	Waikanae River	Total 2008-09 Maintenance
2009	March	Cleared bank to the right channel width	190-200	70	Waikanae River	Maintenance
				80	Waikanae River	Maintenance
				80	Waikanae River	Total 2007-08 Maintenance
2008	January	Realign channel Blakes Waikanae River due to flood damage	210-220	80	Waikanae River	Maintenance
				300	Waikanae River	Total 2006-07 Maintenance
2007	April	Crossblade rightbank kebbles Corner	0350-0360R	50	Waikanae River	Maintenance
2006	March	Gas Crossing RB - Relocate channel to centre of bed.	0155 R	250	Waikanae River	Maintenance
				100	Waikanae River	Total 2005-06 Maintenance
2005	December	Below Olaihangā Boating Club - Deepening channel, re-forming battered berm	070L	100	Waikanae River	Maintenance
				400	Waikanae River	Total 2004-05 Maintenance
2005	February	Above Olaihangā Boating Club - Cross blading against left bank	070 - 080 L	100	Waikanae River	Maintenance
2005	February	Gravel Extraction, bank edge reinstatement, cross blading at Olaihangā both banks	060 - 090	300	Waikanae River	Maintenance
				120	Waikanae River	Total 2003-04 Maintenance
2004	April	Pylon Corner RB - Cross blade new centre channel	0310 R	120	Waikanae River	Maintenance
				190	Waikanae River	Total 2002-03 Maintenance
2003	February	Below Walnut Grove RB - Cross blade new centre channel	0340 R	70	Waikanae River	Maintenance
				120	Waikanae River	Total 2001-02 Maintenance
2002	April	Channel Diversion - Cross blading against left bank above Olaihangā Boating Club	0070 - 0080 L	150	Waikanae River	Maintenance
				300	Waikanae River	Total 2000-01 Maintenance
2001	May	Rebuild LB Berm below Olaihangā Boating Club by Cross blading and deepening channel	0070 - 0080 L	150	Waikanae River	Maintenance
2000	October	Cross blading Edgewater Park RB	0380 - 0390 R	50	Waikanae River	Maintenance
				100	Waikanae River	Maintenance
				140	Waikanae River	Total 1999-2000 Maintenance
2000	May	Channel Realignment - Nimmo Ave East Right Bank	0310 - 0320 R	140	Waikanae River	Maintenance
				500	Waikanae River	Total 1998-99 Flood Repair Works
1998	November	Flood Repair Works - Maple Lane / Sunny Glen - Channel Realignment	0345 - 0390	500	Waikanae River	Flood Repair Works
			Total	2580		
			Ave/year	184		

## Gravel Extraction

Year	Dry: Volume extracted m3 (WGN 980256)	Wet: Volume extracted m3 (WGN 020106)	River mouth realignment: volume extracted in m3
1998/1999	0		
1999/2000	1,409		
2000/2001	3,000		
2001/2002	1,740		8,000
2002/2003	1,672	5,800	
2003/2004	0	7,310	
2004/2005	2,790	10,598	
2005/2006	5,040	9,210	
2006/2007	7,610	1,080	
2007/2008	2,740	0	
2008/2009	2,564	0	
2009/2010	0	0	
2010/2011	2,320		
2011/2012	0	0	
<b>Total</b>	<b>30,885</b>	<b>33,998</b>	<b>8,000</b>

**River Mouth Cuts**

<b>Waikanae</b>	<b>Waimeha</b>
Dec-01	Mar-00
	Jan-02
	Jun-02
	Oct-03
	Jul-04
	Sep-04
	Aug-05
	Aug-06
	Nov-06
	Jul-07
	Nov-07
	Jul-08
	Oct-08
	Mar-09
	Apr-09
	Oct-09
	Dec-09
	Sep-10
	Apr-11
	Jul-11
	Jan-12
	Feb-12
	Sep-12
	Mar-13