

Otaki River - Rock groyne number, tonnage and location

Construction of rock groynes

Year	Amount (tonnes)	Blocks (number)	Number	Location	Cross section
Dec 2007	600	210	2	Lethbridge block and rock groyne x 2	
Dec 2008	4450	96	1	Gas Crossing block and rock groyne	70
May 2009	540	54	1	Built new Groyne Above Highway bridge	
Jun 2009	540		1	Built new Groyne Above Highway bridge	
Mar 2010	950		2	Tracey's block and rock groyne x 2	450
Mar 2010			2	Rock Groynes Bridges Capex Job X2	0350 - 0370
Jun 2010			2	Rock Groynes Bridges Capex Job X2	0350 - 0370
Jul 2011	140		1	Gas Crossing - rock groyne on end of rockline	0120 + 30
Jul 2011	300	50	1	Block and Rock Groyne	0120 - 30
Jan 2011	500		1	Tracey's - rock groyne on end of rockline	460
<b>Total</b>	<b>8,020</b>	<b>410</b>	<b>14</b>		
<b>Average/year</b>	<b>573</b>	<b>29</b>	<b>1</b>		

Maintenance of rock groynes

Year	Amount (tonnes)	Blocks (number)	Location	Cross section	Comment
May 2004	450		Taylor's Reichmuth Barbs RB - Re-constructing barbs Nos 6 & 7	0900 - 0930	Top up
Jun 2004	350		Taylor's Reichmuth Barbs RB - Re-constructing noses of barbs Nos 6 & 7	0900 - 0930	Top up
Apr 2005	100		Taylor's Reichmuth Barbs RB - Re-construct noses of barbs Nos 6 & 7	0900 - 0930	Top up
Dec 2005		24	Tracey LB Debris Fencing - add concrete block "Groyne Heads" to 6 fences	0430 - 0460	Top up
Jan 2006		32	Barretts LB Debris Fencing - add concrete block "Groyne Heads" to 8 fences	0700 - 0710	Top up
Dec 2008	50		Lethbridge	0210-0220	Top up
Dec 2008	50		Mangahene block and rock groyne	70	Top up
Apr 2009	30		Mangahene block and rock groyne	70	Top up
Mar 2010	110		Mangahene block and rock groyne	70	Top up
<b>Total</b>	<b>1,140</b>	<b>56</b>			
<b>Average/year</b>	<b>81</b>	<b>4</b>			

Otaki River - Rock riprap lengths, tonnage and location

Construction of rip-rap

Year	Amount (tonnes)	Length (m)	Location	Cross section	Comment
1998/1999			N/A		
1999/2000	250	150	Upper Taylors		
2000/2001	800	20	Chrystalls Bend - Lower		Construct
	300		Upper Rahui Road	0920 - 0940	
	2,600	260	Mangahanene		Construct
	1,600	150	Gas Crossing		Construct
2001/2002					
2002/2003	500	30	Lethbridge	0230 - 0240	Construct
	1,800	90	Stresscrete	0380 - 0390	Construct
2003/2004					
2004/2005	1,900	130	Chrystalls Bend - Lower	0470 - 0490	Extend
	3,600	256	Transmission Lines	0130 - 0150	Extend
2005/2006			N/A		
2006/2007		40	Upper Taylors		
2007/2008			N/A		
2008/2009			N/A		
2009/2010	60		Bridges	0360	Construct
2010/2011	3,800	235	Leithbridge		Construct
2011/2012			N/A		
<b>Total</b>	<b>17,210</b>	<b>1,361</b>			
<b>Average/year</b>	<b>1,229</b>	<b>97</b>			

Maintenance of rip-rap

Year	Amount (tonnes)	Length (m)	Location	Cross section	Comment
1999/2000	506	60	Chrystalls Bend - Lower		Flood damage
2000/2001	560	90	Chrystalls Bend - Main Wall		Top up
	400	200	Chrystalls Bend - Lower		Top up
	250		Upper Taylors		Top up
	600	250	Stresscrete		Top up
	60	90	Mangahanene	0070 - 0090	Top up
2001/2002	30		Rangiuru floodgate	0040	Top up
	300	200	Upper Rahui Road		Top up
	650	150	Mangahanene		Top up
2002/2003	201	30	Stresscrete		Flood damage
2003/2004	100	100	Lethbridge	0230 - 0240	Top up
	410	120	Upper Taylors	0930 - 0940	Top up
2004/2005	400	80	Mangahanene	0070 - 0080	Flood damage
	100	140	Mangahanene	0070 - 0080	Top up
	200	100	Stresscrete right bank	0380 - 0390	Top up
	240	160	Katihiku	0030 - 0060	
	850	100	Chrystalls bend upper	0560	Flood damage
2005/2006			N/A		
2006/2007			Lethbridge		
2007/2008	100		Mangahanene	0070	Top up
	300		Chrystalls	0560	Top up
	400		Stresscrete		Top up
	230		Stresscrete		Top up
2008/2009					
2009/2010			N/A		
2010/2011	140		Gas Crossing		Top up
2011/2012			N/A		
<b>Total</b>	<b>7,027</b>	<b>1,870</b>			
<b>Average/year</b>	<b>502</b>	<b>134</b>			

**Otaki River - Construct Debris fences**

Year	Length (m)	Location
1998/1999	300	Hughes and Upper Taylors
1999/2000	90	Hughes
	60	Chrystalls Bend
	30	Mangahanene
2000/2001	150	Upper Hughes
2001/2002	N/A	
2002/2003	30	Mangahanene
2003/2004	300	Barretts
	20	Stresscrete
2004/2005	60	Chrystall's
	60	Upper Hughes
	30	Mangahanene
2005/2006		N/A
2006/2007		N/A
2007/2008		N/A
2008/2009		N/A
2009/2010		N/A
2010/2011		N/A
2011/2012		N/A
<b>Total</b>	<b>1130</b>	
<b>Ave/year</b>	<b>81</b>	

**Otaki River - Maintain debris fences**

Year	Length (m)	Location
1998/1999		N/A
1999/2000		N/A
2000/2001		Tracey's
		Chrystall's
2001/2002		N/A
2002/2003	400	Tracey's
	90	Lutz'
2003/2004	200	Barrett's
	210	Lutz'
2004/2005		Chrystall's
	30	Mangahanene
	30	Above Chrystall's
2005/2006	300	Tracey's
	240	Barrett's
2006/2007		N/A
2007/2008		N/A
2008/2009		N/A
2009/2010		N/A
2010/2011		N/A
2011/2012		N/A
<b>Total</b>	<b>1500</b>	
<b>Ave/year</b>	<b>107</b>	

## Otaki River - Willows

### Tethered willows

Year	Material Quantity	Length (m)	Location
1999/2000	50 poles, 21 Railway Irons	80	State Highway Bridge
	<b>Total</b>	<b>80</b>	
	<b>Ave/year</b>	<b>6</b>	

### Willow numbers

Year	Poles	Stakes
1998/1999	384	
1999/2000	868	17,165
2000/2001	507	21,590
2001/2002	2,176	12,160
2002/2003	2,447	7,840
2003/2004	4,395	3,500
2004/2005	4,607	2,430
2005/2006	7,179	700
2006/2007	1,600	700
2007/2008	1,660	
2008/2009	2,490	
2009/2010	2,220	
2010/2011	1,230	
2011/2012	1,810	
<b>Total</b>	<b>33,573</b>	<b>66,085</b>
<b>Ave/year</b>	<b>2,398</b>	<b>4,720</b>

### Willow length (as % of scheme length)

\* scheme length is 22.2 km. 11.1km per bank

**Right bank: 9.038 km (81%)**

**Left Bank: 9.762 km (88%)**

## Record of bed recontouring activities in the Otaki River

Year	Month	Location	X Section	Length (m)	Reach	Comment
				<b>400</b>		<b>Total 2011-12</b>
2012	January	Dozer Hunns/barett's channel realignment		150	Otaki River	maintenance
2012	January	Dozer upper Rahui channel Realignment		150	Otaki River (Upper)	maintenance
2012	January	Dozer Upper Taylors channel realignment		100	Otaki River (Upper)	maintenance
2011	July	Flood relief Cut stresscrete	430-460	?	Otaki River (Upper)	maintenance
				<b>770</b>		<b>Total 2010-11</b>
2011	May	Channel realignment below Winstones	210-220	120	Otaki River (Upper)	Maintenance
2011	May	Digger and dumpers below Winstones	210-220 R	200	Otaki River (Upper)	Maintenance
2010	December	Winstones Beach recontouring	250 L	100	Otaki River (Upper)	Maintenance
2010	November	Channel realignment Wallace	630-660 R	350	Otaki River (Upper)	Maintenance
				<b>1200</b>		<b>Total 2009-10</b>
2010	May	Redo channel cut Hughes/Lutz		120	Otaki River (Upper)	Maintenance
2010	May	Redo channel cut Upper Taylors		160	Otaki River (Upper)	Maintenance
2010	January	Flood relief Cut Lutz/Upper taylors	820-850	200	Otaki River (Upper)	Maintenance
2010	January	Channel realignment below bridges	290 R	150	Otaki River (Upper)	Maintenance
2009	December	Flood relief cut Lutz	830-850 R	150	Otaki River (Upper)	Maintenance
2009	November	Redo channel diversion after flood Wallace		100	Otaki River (Upper)	Maintenance
2009	November	Redo Channel diversion after flood Winstones	240-250	150	Otaki River (Upper)	Maintenance
2009	October	Re-develop secondary channel through middle Lutz' RB Debris fencing	670-690R	50	Otaki River (Upper)	Maintenance
2009	October	Develop secondary channel Hughes/Lutz RB edge	670-680	120	Otaki River (Upper)	Maintenance
				<b>760</b>		<b>Total 2008-09</b>
2009	April	Channel Realignment opp Winstones	0250 - 0270 L	200	Otaki River (Lower)	Maintenance
2009	March	Upper Taylors channel alignment	XS810-XS820	70	Otaki River (Upper)	Maintenance
2009	March	Lutz channel alignment	XS840-XS850	70	Otaki River (Upper)	Maintenance
2008	December	Channel Alignment	0240-0250RB	70	Otaki lower	Maintenance
2008	November	Channel Alignment	710-0740R	300	Otaki River (Upper)	Maintenance
2008	November	Channel Alignment	810-8120R	200	Otaki River (Upper)	Maintenance
2008	November	Channel Alignment	850-860R	50	Otaki River (Upper)	Maintenance
				<b>970</b>		<b>Total 2007-08</b>
2008	May	Realign channel below Highway bridge	330	300	Otaki River (Lower)	Maintenance
2007	November	Channel alignment Tracey's	0400-0420L	200	Otaki River (Middle)	Maintenance
2007	November	Channel alignment Woods	0770-0780	120	Otaki River (Upper)	Maintenance
2007	November	Channel alignment Rahui	0770-0780	250	Otaki River (Upper)	Maintenance

2007	October	Channel alignment Wallace/Lutz	0770-0780	50	Otaki River (Upper)	Maintenance
2007	October	Channel alignment Wallace	0700-0730	50	Otaki River (Upper)	Maintenance
				<b>450</b>		<b>Total 2006-07</b>
2007	January	Cross Blading secondary channel at Barretts to divert main flow out of work area	0700 - 0710 L	300	Otaki River (Upper)	Maintenance
2006	December	Flood Damage Repairs - above Chrystalls RB - Cross Blading	O510 R	100	Otaki River (Upper)	Maintenance
2006	December	Lutz'/Wallace RB Debris Fencing - re-develop secondary channel through middle	0670 - 0690 R	50	Otaki River (Middle)	Flood Damage
				<b>600</b>		<b>Total 2005-06</b>
2006	January	Cross Blading secondary channel at Barretts to divert main flow out of work area.	0700 - 0710 L	300	Otaki River (Upper)	Maintenance
2005	December	Cross Blading secondary channel at Tracey's to divert main flow out of work area.	0430 - 0460	300	Otaki River (Middle)	Maintenance
				<b>1160</b>		<b>Total 2004-05</b>
2005	May	Flood Damage Repairs - Campbells LB - Cross Blading	0290 - 0320 L	350	Otaki River (Lower)	Maintenance
2005		Flood Damage Repairs - above Chrystalls RB - Cross Blading	0560 - 0580 R	110	Otaki River (Upper)	Maintenance
2005		Flood Damage Repairs - above Chrystalls RB - Re-define secondary channel	0560 - 0580 R	250	Otaki River (Upper)	Maintenance
2005	March	Develop secondary channel at Hunns' LB, plus Cross blading	0690 - 0710 L	200	Otaki River (Upper)	Maintenance
2004	December	Campbell's LB - Reinstate berm at toe of stopbank - Cross blading & excavating gravels	0290 - 0320 L	200	Otaki River (Lower)	Maintenance
	November	Chrystalls RB - Develop temporary diversion for placing rock at lower RB wall extension	0530 - 0540 R	50	Otaki River (Middle)	Maintenance
				<b>890</b>		<b>Total 2003-04</b>
2004	May	Mangahanene LB - Develop new main channel through middle	0100 - 0120 R	300	Otaki River (Lower)	Maintenance
		Lutz' RB Debris Fencing - re-develop secondary channel through middle	0670 - 0690 R	150	Otaki River (Upper)	Maintenance
2003	October	Develop secondary channel below Stresscrete, plus Cross blading	0370 - 0390 R	140	Otaki River (Middle)	Maintenance
		Develop secondary channel Tracey to Chrystalls bend, plus Cross blading	0440 - 0480 L	100	Otaki River (Middle)	Maintenance
		Cross blading above Chrystalls rock line	0571 - 0590 R	200	Otaki River (Upper)	Maintenance

				<b>1010</b>		<b>Total 2002-03</b>
2003	March	Cross blade Campbell's LB	0290 - 0320 L	200	Otaki River (Lower)	Maintenance
2002		Develop secondary channel at Barretts' LB, plus Cross blading	0610 - 0630 L	200	Otaki River (Upper)	Maintenance
		Develop secondary channel at Lutz' RB, plus Cross blading	0760 - 0780 R	150	Otaki River (Upper)	Maintenance
	October	Cross blading above Chrystalls rock line	0571 - 0590 R	200	Otaki River (Upper)	Maintenance
		Develop secondary channel below Stresscrete, plus Cross blading	0370 - 0390 R	140	Otaki River (Middle)	Maintenance
		Develop secondary channel Tracey to Chrystalls bend, plus Cross blading	0440 - 0480 L	120	Otaki River (Middle)	Maintenance
				<b>300</b>		<b>Total 2001-02</b>
2001	December	Develop extracted channel - Rangiuuru RB, Cross Blading	0130 - 0140 R	100	Otaki River (Lower)	Maintenance
	December	Develop secondary channel Andrews - Cross blading	0571 L	80	Otaki River (Middle)	Maintenance
	December	Develop new main channel Hughes - Cross blading	0670 - 0680 R	120	Otaki River (Upper)	Maintenance
				<b>660</b>		<b>Total 2000-01</b>
2001	May	Lutz/Thurley widen channel along RB, dump under cliffs LB	0760 - 0780 R	150	Otaki River (Upper)	Maintenance
	February	Barretts/Lower Hughes RB Channel Diversion, cross blading (D9H 25.5 hrs)	0670 - 0680 R	160	Otaki River (Middle)	Maintenance
	February	Thurley LB Channel Diversion, cross blading	800	100	Otaki River (Upper)	Maintenance
2000	October	Flood Repair Works - below SH bridge LB	330	250	Otaki River (Lower)	Maintenance
				<b>500</b>		<b>Total 1999-2000</b>
2000	May	Develop secondary channel Hughes/Barretts 200 m, Cross blading 50m	0670 - 0680	250	Otaki River (Upper)	Maintenance
1999	December	Flood Repair Works - Empsons' - Channel Realignment, Cross blading	0730 - 0750	250	Otaki River (Upper)	Maintenance
				<b>0</b>		<b>Total 1998-99</b>
1998				0		

**Otaki River - gravel extraction, channel diversion cuts & river mouth cutting**

<b>Year</b>	<b>Gravel Extraction WGN 980254 (m<sup>3</sup>)</b>	<b>Channel Diversion cuts (no)</b>	<b>River Mouth Realignment (no)</b>
1998/1999	11,040	0	
1999/2000	71,492	0	
2000/2001	39,340	3	
2001/2002	36,250	1	
2002/2003	54,004	4	2 (Jul & Aug '02)
2003/2004	28,088	7	
2004/2005	35,366	3	
2005/2006	41,442	2	1 (Aug '05)
2006/2007	40,929	1	
2007/2008	38,006	0	
2008/2009	55,480	0	
2009/2010	49,095	2	1 (Sep '09)
2010/2011	46,579	0	
2011/2012	50,255	2	1 (Jul '11)
<b>Total</b>	<b>597,366</b>	<b>25</b>	<b>5</b>