Return to previous file: sfc302a

Appendix 1

REACH TYPES

Figure A1.1. Headwaters. Main channel of the upper Waiapu River, East Cape. Note steep gradient and banks, and the absence of a floodplain or any lateral aquatic habitats.

Figure A1.2. High lateral input, confined reach. The Clyde River at the confluence with the Frances River, Rangitata River system, Canterbury. Note large shingle fans and bedrock bluffs, which influence floodplain topography.

Figure A1.3. Gorge reach. The Rangitata gorge, Canterbury.

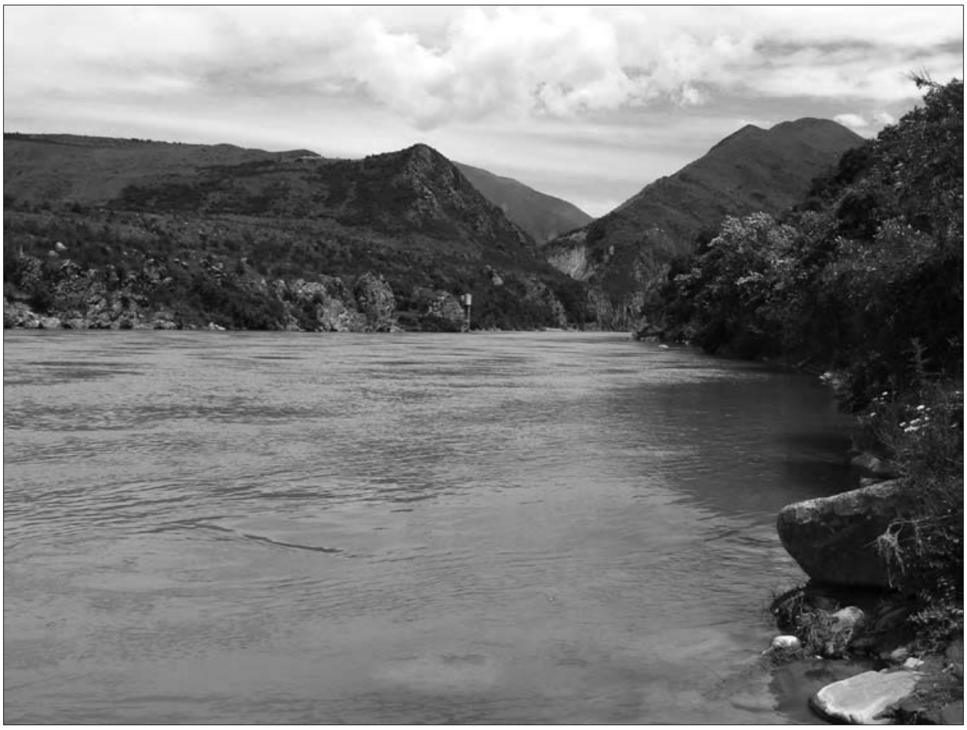

Figure A1.4. Low lateral inputs, confined reach. The Ngaruroro River opposite the 'Pig Stye', Hawke's Bay.

Figure A1.5. An impacted reach. The lower Waimakariri River, north of Christchurch, channelised by stopbanks.

Appendix 2

PRESENCE/ABSENCE OF INVERTEBRATE TAXA IN THE 11 BRAIDED RIVERS INCLUDED IN OUR STUDY

	WAIAPU	NGARURORO	TUKITUKI	WAIRAU	TARAMAKAU	LANDSBOROUGH	WAIMAKARIRI	RAKAIA	RANGITATA	WAITAKI	ORETI
Ephemeroptera											
Ameletopsis	0	1	0	0	1	0	0	0	0	0	0
Atalophlebioides	1	1	1	0	1	0	1	0	1	0	0
Austroclima	0	0	0	1	0	0	0	0	0	0	1
Coloburiscus	0	1	1	1	1	0	0	0	1	0	1
Deleatidium	1	1	1	1	1	1	1	1	1	1	1
Ichthybotus	0	1	0	0	0	0	0	0	0	0	0
Mauiulus	0	0	0	1	1	0	0	0	0	0	0
Nesameletus austrinus	0	0	0	0	0	1	0	0	1	0	0
Nesameletus ornatus	0	1	1	1	1	1	1	1	0	1	1
Oniscigaster distans	0	0	0	1	1	0	0	0	0	0	1
Oniscigaster wakefieldi	0	0	0	1	0	0	0	0	0	0	1
Zephlebia	0	0	0	1	1	0	0	0	0	0	0
Neozephlebia scita	0	1	0	0	1	1	0	0	0	0	0
Plecoptera											
Austroperla cyrene	0	1	1	0	1	1	0	0	0	0	1
Cristaperla	0	1	0	0	0	0	0	1	1	0	0
Megaleptoperla diminuta	0	0	1	0	1	0	0	0	0	1	1
Megaleptoperla grandis	0	1	0	0	1	0	1	0	0	0	1
Spaniocerca	0	1	0	1	1	0	1	0	1	1	0
Stenoperla prasina	0	1	0	0	1	0	1	0	0	0	1
Stenoperla maclellani	0	1	0	1	1	0	1	0	0	0	1
Taraperla howesi	0	0	0	0	0	0	1	0	0	0	0
Zelandobius	0	1	0	1	1	1	1	1	1	1	1
Zelandobius pilosus	0	0	0	1	1	0	1	1	1	0	1
Zelandoperla	0	1	1	1	1	1	1	1	1	1	1
Trichoptera											
Aoteapsyche	1	1	1	1	1	1	1	1	1	1	1
Beraeoptera roria	0	1	0	0	0	0	1	0	1	0	0
Costachorema psaropterum	0	0	0	1	1	0	0	0	1	0	1
Costachorema callistum	0	0	0	0	1	0	0	0	0	1	0
Costachorema xanthopterum	0	0	0	1	0	0	1	0	1	1	1
Edpercivalia	0	0	0	0	0	0	0	0	1	0	0
Ecnomina zealandica	0	0	0	0	0	0	0	0	0	0	1
Hudsonema alienum	0	0	0	1	1	1	0	1	0	1	1
Hudsonema amabile	0	1	1	1	1	1	0	1	1	1	1

Continued on next page

	WAIAPU	NGARURORO	TUKITUKI	WAIRAU	TARAMAKAU	LANDSBOROUGH	WAIMAKARIRI	RAKAIA	RANGITATA	WAITAKI	ORETI
Hydrobiosella	1	0	0	0	0	0	0	0	0	1	0
Hydrobiosis chalcodes	0	0	0	1	0	0	0	0	0	1	0
Hydrobiosis charadraea	1	1	1	1	1	1	1	1	0	1	0
Hydrobiosis clavigera	1	0	0	1	1	0	0	0	0	1	1
Hydrobiosis copis	0	1	0	1	1	0	0	0	0	1	1
Hydrobiosis frater	0	0	0	0	0	0	0	1	1	1	0
Hydrobiosis harpidiosa	0	1	0	0	0	0	0	0	0	1	0
Hydrobiosis neadelphus	0	0	0	1	0	0	0	0	1	0	0
Hydrobiosis parumbripennis	1	1	1	1	1	1	1	1	1	1	1
Hydrobiosis silvicola grp	0	0	0	0	0	0	1	1	1	0	0
Hydrobiosis spatulata	0	0	0	1	1	1	0	1	0	0	0
Hydrobiosis soror	1	1	1	1	0	0	0	0	0	1	1
Hydrobiosis torrentis	0	0	0	0	1	0	1	0	0	0	0
Hydrobiosis umbripennis	1	1	1	1	1	1	1	1	1	1	1
Hydrochorema tenuicaudatum	1	1	1	1	1	0	0	1	1	0	1
Helicopsyche	0	0	1	1	1	1	1	0	0	0	0
Neurochorema confusum	0	1	0	1	0	0	0	0	0	0	0
Neurochorema	0	1	0	1	0	0	0	1	0	0	1
Oecetis unicolor	0	0	0	0	0	1	0	0	0	0	0
Oeconesus	0	1	0	1	1	0	1	0	0	1	0
Olinga feredayi	1	1	1	1	1	0	1	1	1	0	1
Oxyethira	1	1	1	1	1	1	1	1	1	1	1
Paroxyethira eatoni	0	1	1	1	1	1	1	1	1	1	1
Paroxyethira hendersoni	0	1	1	1	0	1	1	1	0	1	1
Philorheithrus agilis	0	0	0	1	0	0	0	0	1	0	1
Plectrocnemia maclachlani	1	1	1	1	1	0	1	0	0	1	1
Polyplectropus	0	1	1	1	1	0	1	0	0	1	1
Psilochorema	1	1	1	1	1	1	1	1	1	1	1
Pycnocentria evecta	0	1	1	1	1	0	1	1	1	1	1
Pycnocentria funerea	0	1	0	1	0	0	1	0	1	1	0
Pycnocentrodes	0	1	1	1	1	1	1	1	1	1	1
Traillochorema	0	0	0	1	0	0	1	0	0	1	0
Tiphobiosis	0	0	0	0	0	0	0	0	1	0	0
Triplectides obsoletus	1	1	0	1	1	1	1	1	0	1	1
Triplectides cephalotes	0	1	0	0	0	0	0	0	0	0	0
Triplectidina	0	1	0	1	0	0	0	0	0	0	0
Coleoptera											
Antiporus femoralis	1	1	0	0	0	0	0	0	0	0	0
Antiporus strigosulus	1	1	1	1	1	1	0	1	1	0	1
Berosus	1	1	1	1	1	1	1	1	1	1	1
Elmidae	1	1	1	1	1	1	1	1	1	1	1
Enochrus	0	1	0	0	0	0	0	0	0	0	0
Huxelhydrus syntheticus	1	1	1	1	1	1	1	1	1	0	1
Hydraenidae	1	1	1	1	1	0	0	0	1	0	1
Hyphydrus elegans	1	0	1	0	0	0	0	0	0	0	0
Hydrophilidae	1	1	1	0	0	0	0	0	0	1	0

Continued on next page

	WAIAPU	NGARURORO	TUKITUKI	WAIRAU	TARAMAKAU	LANDSBOROUGH	WAIMAKARIRI	RAKAIA	RANGITATA	WAITAKI	ORETI
Liodessus deflectus	1	1	1	1	1	0	0	0	1	1	0
Liodessus plicatus	1	1	1	1	1	1	1	1	1	1	0
Paracymus	1	1	0	0	0	0	0	0	0	0	0
Podaena	0	0	0	0	0	0	0	0	1	0	0
Ptilodactylidae	0	1	0	1	0	0	0	0	0	0	0
Rhantus suturalis	0	1	0	1	1	1	1	1	1	1	1
Staphylinidae	0	0	0	0	1	0	0	0	0	0	0
Scirtidae	1	1	1	1	1	1	1	1	1	1	0
Diptera											
Aphrophila	1	1	1	1	1	1	1	0	1	1	1
Austrosimulium	0	1	1	1	1	1	1	1	1	1	1
Ceratopogonidae	1	1	1	1	1	1	1	1	1	1	1
Corynocera	0	0	0	0	0	1	1	1	0	0	0
Chironominae	1	1	1	1	1	1	1	1	1	1	1
Culex	1	0	1	1	0	1	1	0	1	1	0
Diamesinae	1	1	1	1	1	1	1	0	1	1	1
Empididae	0	0	0	1	0	0	1	0	0	1	1
Ephydrella aquaria	0	0	1	1	1	0	1	0	0	0	0
Eriopterini	1	1	1	1	1	1	1	1	1	1	1
Hexatomini	1	1	1	1	1	1	0	1	1	1	1
Paralimnophila skusei	0	1	1	1	0	1	1	0	0	1	1
Limonia	0	1	0	1	1	0	1	1	1	1	0
Molophilus	1	1	1	1	1	1	1	1	1	1	1
Muscidae	1	1	1	1	1	1	1	1	1	1	1
Neocurupira	0	0	0	0	1	1	1	1	1	1	1
Ochlerotatus antipodeus	0	0	0	0	0	0	1	0	0	0	0
Orthocladiinae	1	1	1	1	1	1	1	1	1	1	1
Paradixa	0	0	1	1	0	0	1	1	0	1	1
Pelecorhynchidae	0	1	0	0	0	0	1	1	0	0	0
Psychodidae	1	0	0	1	1	0	0	0	0	0	0
Neolimnia	0	1	0	0	0	0	0	0	1	1	1
Scatella	0	1	1	0	1	0	0	1	0	0	0
Stratiomyidae	1	1	0	1	1	1	0	1	0	1	0
Tabanidae	0	1	1	1	1	0	0	0	0	0	0
Tanyderidae	1	0	0	1	1	0	0	1	0	1	1
Tanypodinae	1	1	1	1	1	1	1	1	1	1	1
Zelandotipula	0	0	0	1	1	0	0	1	0	1	0
Mollusca											
Potamopyrgus	1	1	1	1	1	1	1	1	1	1	1
Gyraulus corinna	1	1	1	1	0	0	0	0	0	1	1
Haitia acuta	0	1	1	1	0	0	0	0	1	1	1
Austropeplea tomentosa	0	1	0	1	1	0	1	0	1	1	1
Crustacea											
Copepoda	0	0	0	0	0	0	1	1	0	0	1
Ostracoda	1	1	1	1	0	0	1	1	1	1	1

Continued on next page

	WAIAPU	NGARURORO	TUKITUKI	WAIRAU	TARAMAKAU	LANDSBOROUGH	WAIMAKARIRI	RAKAIA	RANGITATA	WAITAKI	ORETI
Cruregens fontanus	0	1	1	0	0	0	0	0	0	0	0
Phreatogammarus	0	1	1	1	1	0	0	1	0	0	0
Paraleptamphopus caeruleus	0	0	0	0	0	0	0	0	0	0	1
Paracrangonyx	1	1	0	1	0	0	0	0	0	0	0
Paraleptamphopus spp.	1	1	1	1	1	1	1	1	1	1	1
Paratya curvirostris	0	1	1	0	0	1	0	0	0	0	0
Paracalliope fluvitalis	0	1	1	0	0	0	0	0	0	1	1
Others											
Namanereis tiriteae	1	1	1	0	0	0	0	0	0	0	0
Anisops wakefieldi	1	1	1	1	1	1	0	1	1	1	1
Archichauliodes diversus	0	1	1	1	1	0	0	0	0	0	1
Tricladida	1	1	1	1	0	0	1	1	1	1	1
Hirudinea	0	0	1	1	0	0	1	0	0	1	1
Microvelia macgregori	1	1	1	1	1	1	0	0	1	1	0
Nematomorpha	0	0	0	0	0	1	0	0	0	0	0
Oligochaeta	1	1	1	1	1	1	1	1	1	1	1
Prorhynchus	0	0	0	0	0	0	0	0	0	1	0
Acari	1	0	1	1	0	0	1	0	1	1	1
Sigara	1	1	1	1	1	1	1	1	1	1	1
Hygraula nitens	0	1	1	1	0	1	0	0	0	1	1
Musculium novaezelandiae	0	1	1	1	0	1	1	1	0	1	1
Ischnura	1	0	0	0	0	0	0	0	0	0	0
Austrolestes colensonis	1	1	0	1	0	1	1	0	1	1	1
Xanthocnemis	1	1	1	1	1	1	1	1	0	1	1
Procordulia	0	1	0	1	1	1	0	0	0	1	1
Total	**56**	**96**	**72**	**99**	**83**	**58**	**72**	**61**	**67**	**81**	**82**

Appendix 3

SATURATION ANALYSIS

TABLE A3.1. SATURATION ANALYSIS AT THE A. RIVER, B. REACH, AND C. HABITAT SCALE.

Number of samples is the total number of Surber samples taken in each category. Estimated total richness was calculated in EstimateS (Colwell 2005) using the MMMeans extrapolation. Saturation is the percentage of the estimated total that was observed in each category.

A

RIVER	NUMBER OF SAMPLES	NUMBER OF INDIVIDUALS	OBSERVED RICHNESS	ESTIMATED RICHNESS	SATURATION
Waiapu	45	3264	45	60	75
Ngaruroro	60	19219	87	104	84
Tukituki	45	16678	65	79	82
Wairau	66	18520	86	101	85
Taramakau	54	7953	77	100	77
Waimakariri	60	7600	59	84	70
Rakaia	57	4255	49	60	82
Rangitata	57	5168	56	74	76
Landsborough	48	2531	42	59	71
Waitaki	57	9198	66	77	86
Oreti	48	14831	73	88	83

B

REACH	NUMBER OF SAMPLES	NUMBER OF INDIVIDUALS	OBSERVED RICHNESS	ESTIMATED RICHNESS	SATURATION
Headwaters	36	6188	54	77	70
High lateral, confined	267	42136	115	121	95
Gorge	27	1991	34	48	71
Low lateral, confined	108	24792	85	98	87
Impacted	138	29946	89	98	91

C

HABITIAT	NUMBER OF SAMPLES	NUMBER OF INDIVIDUALS	OBSERVED RICHNESS	ESTIMATED RICHNESS	SATURATION
Main channel	198	24722	84	87	97
Side braid	90	10627	63	71	89
Spring creek	93	28757	95	106	90
Spring source	114	22606	102	118	86
Pond	102	22505	74	83	89

How taxonomically rich are braided rivers?

The invertebrate communities of braided rivers have been described as taxonomically depauperate 'biological deserts'. In this study, surveys of 11 braided rivers incorporating habitat, reach and catchment scales showed that they actually support very diverse invertebrate assemblages when all floodplain habitats are included in the analysis. There is no consistent longitudinal pattern in taxonomic richness or density. However, braided reaches are more diverse than headwater or gorge reaches, and the majority of springs and ponds are more diverse than main channels. Lateral floodplain habitats are thus biodiversity hotspots that need to be included in future sampling designs and management strategies.

Gray, D.; Harding, J.S. 2010: Spatial variation in invertebrate communities in New Zealand braided rivers. *Science for Conservation 302*. 43 p.

New Zealand Government