

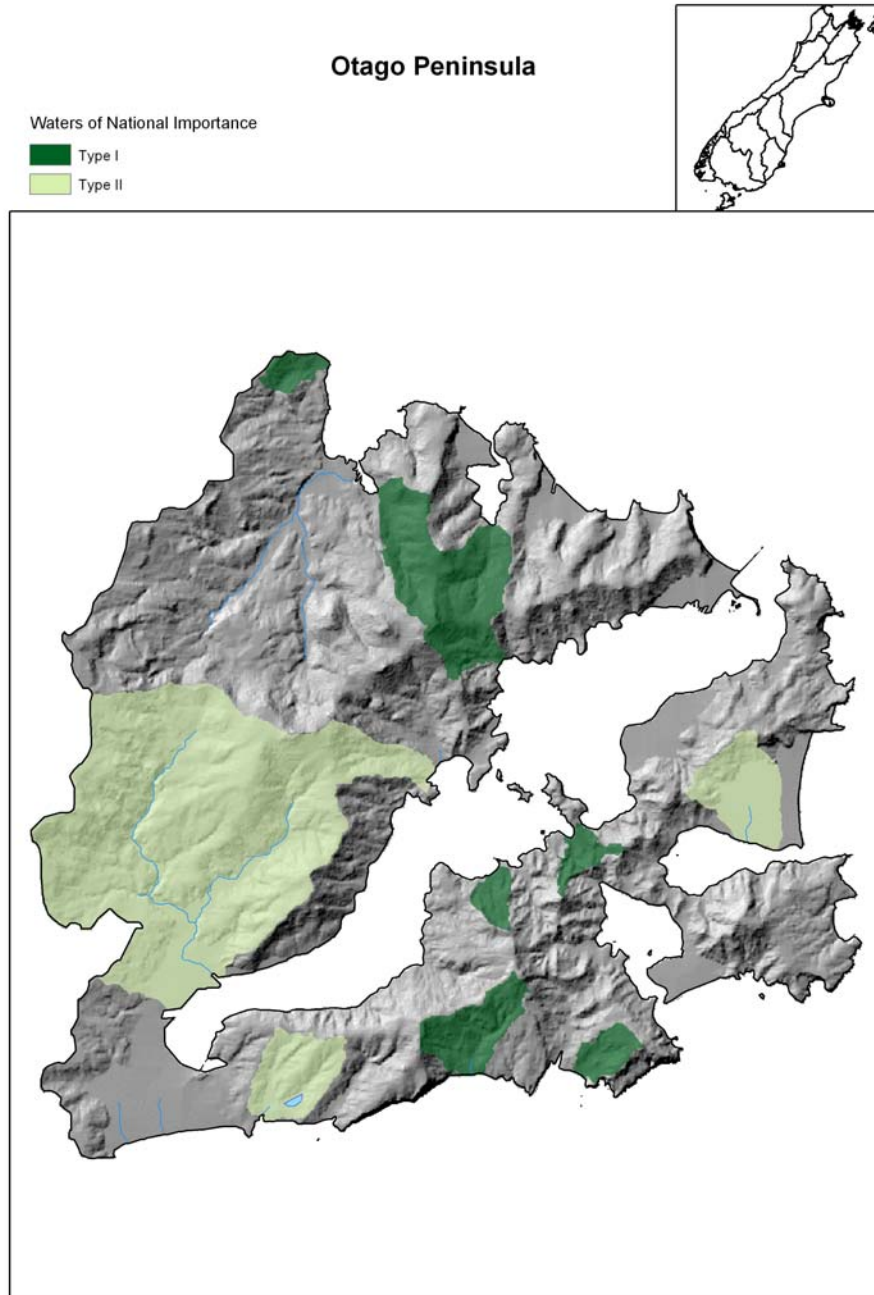
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This unit comprises extensive areas of steep, mountainous country formed from rocks of widely varying ages. They include extensive older granite, greywacke, limestone and marble, and younger (Miocene to Eocene) sandstone, siltstone and limestone (Leathwick et al. 2003). It was probably much less affected by glaciation during the Last Glacial Maximum than units located further south—particularly those along the Southern Alps.

The north-west Nelson region is known as an area of stonefly and caddisfly endemism (Henderson 1985; McLellan 1990) and marks the southern limit of several mayfly species widespread throughout the North Island (e.g., *Zephlebia dentata*, *Z. versicolor*: Hitchings 2001). A number of locally distributed caddisflies (Collier 1993) and four endemic genera of aquatic snails occur only in this unit (M. Haase pers. comm.). The region is also known for its high species richness of vascular plants (e.g., McGlone 1985) and large land snails (Walker 2003), suggesting that other endemic stream invertebrates probably await discovery (Leathwick et al. 2003).

The unit includes the Mokihinui, Karamea, Heaphy, Aorere and Takaka Rivers, the former two rating in the top 20 New Zealand rivers by natural heritage score. This reflects the largely intact nature of their catchment vegetation, but also their environmental richness (and hence presumably ecological diversity) which is a product of their diverse geology. All provide important habitats for blue duck and contain populations of threatened fish, most notably longfin eel. The Aorere also has significant populations of threatened giant and short-jawed kokopu.

Northwest Nelson-Paparoa										
Catchment number	Name	Type	Heritage value score	Euclidean distance	Total REC classes (109)	Cumulative % REC classes	Area (ha)	% Natural cover	% DOC	Special features and notes
71	Karamea River	I	3.978	0.193	65	59.6	121171.3	99.1	98.2	T10, threatened plants, birds and fish, B.Duck, highly natural
130	Mokihinui River	I	2.623	0.159	50	65.1	75143.3	98.5	96.0	T10, threatened plants, B.Duck, highly natural
109	Takaka River	I	1.292	0.239	74	84.4	87125.9	86.3	76.2	T10, B.Duck, threatened birds, Nat.Imp.Site (Pupu Spring)
258	Heaphy River	I	1.137	0.399	24	85.3	29775.7	100.0	99.3	T10, B.Duck, threatened birds and fish
418	Fox River	I	1.134	0.270	20	86.2	10518.0	100.0	96.4	T10 and B.Duck
222	Aorere River	I	0.771	0.194	59	93.6	36541.4	81.7	69.4	T10, B.Duck, threatened fish
1154	Mangarakau flat	I	0.359	0.626	6	94.5	1322.3	92.2	74.3	
674	Sandhills Creek	I	0.337	0.330	15	95.4	3808.2	90.0	73.4	Threatened fish, coastal lake



Otago Peninsula consists of numerous small, steep catchments draining dissected, loess-mantled basaltic rocks dating from the Miocene. At least two aquatic invertebrate species are endemic to the peninsula: the caddisfly *Pseudoeconesus paludis* (Collier et al. 2000; Leathwick et al. 2003) and the isopod *Austridotea benbami* (Chadderton et al. 2003b).

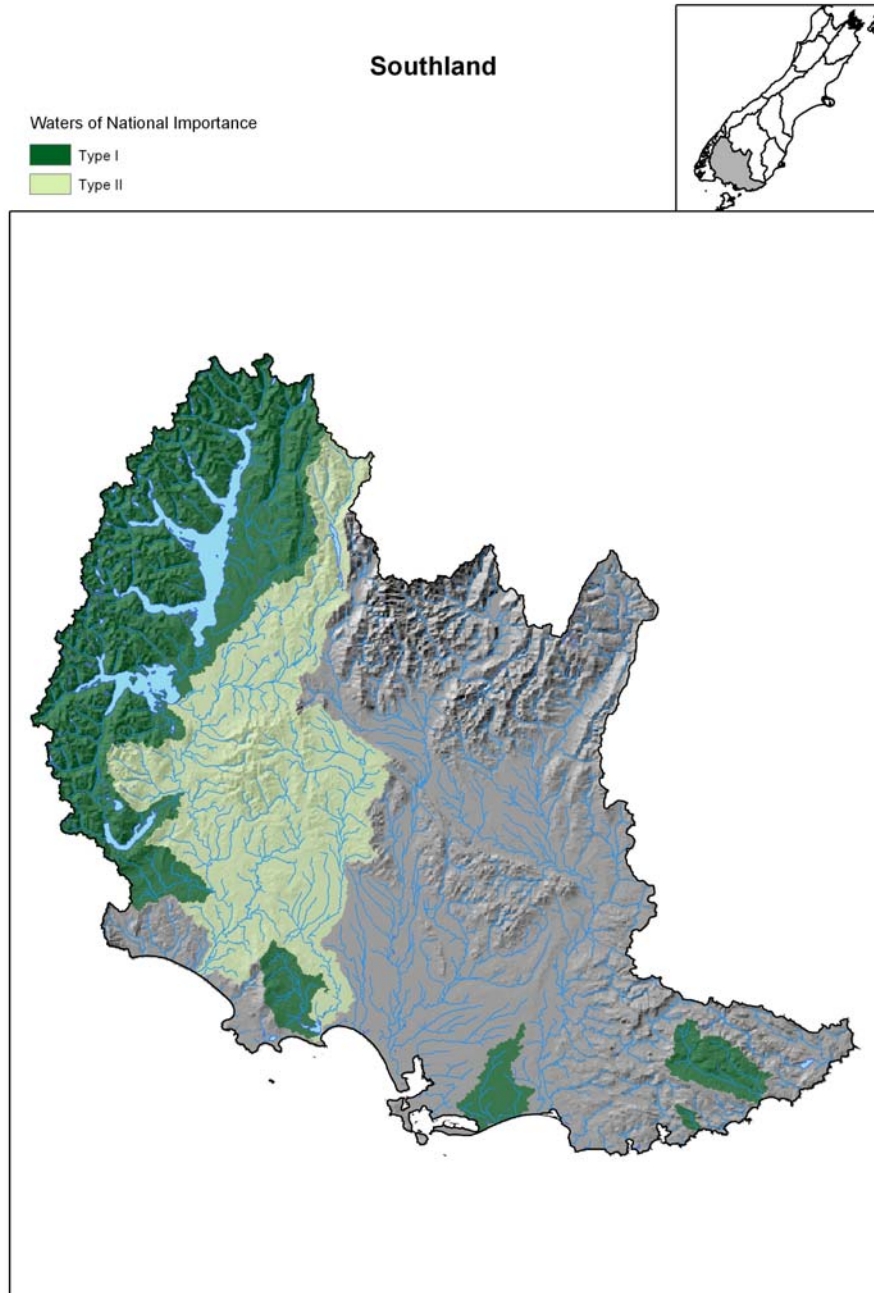
A number of the headwaters of the Leith Stream are contained within Dunedin City Council water catchments, and are protected from major changes to catchment vegetation. Water intakes act as barriers to introduced fish; many catchments appear to be trout-free. The headwaters of the Leith and Mihiwaka Stream also contain major populations of the peninsula-endemic isopod *A. benbami*, that is listed as a threatened freshwater invertebrate species (Hitchmough 2002; Chadderton et al. 2003b).

Otago Peninsula										
Catchment number	Name	Type	Heritage value score	Euclidean distance	Total REC classes (22)	Cumulative % REC classes	Area (ha)	% Natural cover	% DOC	Special features and notes
3399	Sandymount	I	0.197	0.987	2	9.1	170.1	61.4	83.8	T10
2011	Orokonui Creek	I	0.023	0.462	2	18.2	447.2	78.6	56.9	DOC Management site
2096	Robertsons Creek	I	0.003	0.460	2	22.7	416.4	5.2	10.5	
3841	Lathen Bay	I	0.002	0.496	3	27.3	140.1	17.7	0.0	
3840	Blue Skin Bay North	I	0.002	0.941	2	36.4	140.1	33.9	0.0	
2044	Purakinui Stream	I	0.001	0.384	2	36.4	434.3	28.2	0.3	Native fish
2942	Mihiwaka Stream	I	0.001	0.445	2	36.4	217.7	81.5	1.2	Threatened invertebrate
4105	Broad Bay	I	0.001	0.297	3	40.9	125.2	6.8	0.0	
1964	Tomahawk Lagoon streams	II	0.001	0.308	4	45.5	466.4	8.4	0.0	
1873	Okia Flat	II	0.001	0.385	5	50.0	520.1	7.4	0.0	
2343	Sawyers Bay	II	0.000	0.460	2	54.5	332.9	25.7	0.0	
590	Leith River	II	0.001	0.188	13	81.8	4866.8	39.0	0.8	T10, DCC water catchments, threatened invertebrate



This elongated unit consists of numerous, mostly small, catchments draining steep hill-country formed from Mesozoic to Oligocene sedimentary rocks along the east coast of the southern North Island. The small catchment sizes combined with limited coastal plains is thought to have resulted in a high vulnerability to extinction. The relatively well defined ranges separating this unit, and limited area of the coastal plains that would have occurred during glacial periods, have probably prevented recolonisation by less-mobile species (Leathwick et al. 2003). The stream communities of this unit are, however, poorly known.

Palliser-Kidnappers										
Catchment number	Name	Type	Heritage value score	Euclidean distance	Total REC classes (45)	Cumulative % REC classes	Area (ha)	% Natural cover	% DOC	Special features and notes
1185	Okau Stream	I	0.553	0.559	6	13.3	1245.2	77.6	0.0	T10, threatened plants
1902	Little Mangatoeroe Stream	I	0.212	0.926	2	15.6	502.5	91.5	31.9	T10, highly natural
3221	Te Ika Pakake Stream	I	0.176	0.916	2	17.8	186.8	94.5	0.0	T10, highly natural
1180	Waitetuna Stream	I	0.168	0.678	4	22.2	1260.3	98.0	67.3	T10, highly natural
1684	Purangirua Stream	I	0.152	0.679	4	24.4	646.9	99.4	83.3	T10, highly natural
924	Makotukutuku Stream	I	0.104	0.489	8	26.7	2146.2	78.6	69.0	T10
1343	Stream North of Homewood	I	0.063	0.231	7	37.8	988.7	71.4	0.0	
1099	Mangatoetoe Stream	I	0.047	0.529	6	40.0	1455.2	95.2	44.6	
808	Whawanui River	I	0.023	0.353	9	42.2	2711.3	88.8	39.2	
142	Pahaoa River	II	0.028	0.061	21	57.8	64963.5	22.6	0.6	Threatened plants
167	Whareama River	II	0.016	0.165	15	60.0	53170.0	14.4	2.0	Threatened plants
110	Porangahau River	II	0.004	0.181	25	73.3	85343.6	9.3	0.1	Best estuary in unit, native fish
157	Akitio River	II	0.003	0.165	33	82.2	58956.7	13.3	0.2	



This extensive, predominantly lowland unit includes the Catlins, Tahakopa, Mataura, Oreti, Aparima and Waiau Rivers. The first two of these drain low, dissected hill-country cut into the sandstone rocks of the Catlins. The remaining four rivers have their headwaters further north in the ranges of inland Southland, flowing across extensive areas of glacial gravels, loess and alluvium in their lower catchments.

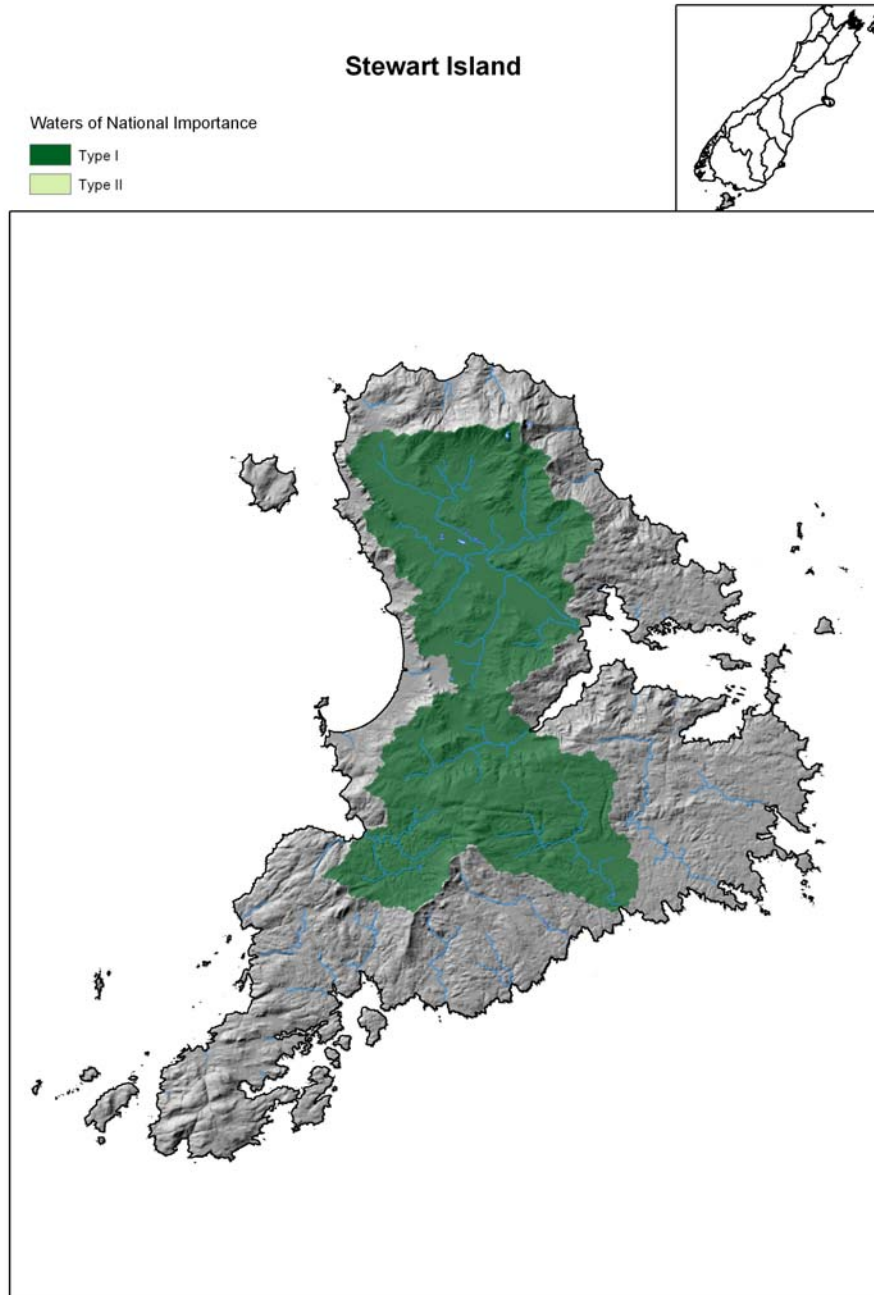
Non-diadromous fish species present in this unit include *Galaxias* 'southern', *G. gollumoides*, and *Gobiomorphus breviceps*. *Galaxias paucispondylus* also occurs at a few sites in the upper Mataura, and has been recorded from tributaries from above the Mavora Lakes in the headwaters of the Oreti River. Several aquatic snail species occur only in Southland (M. Haase pers. comm.).

Tributaries of the upper Waiau River dominated heritage scores, particularly those that drain Fiordland National Park. These rivers are highly natural, although above the Mararoa Weir, diadromous fish passage is affected by this barrier. The lower river is impacted by river diversion at the weir, which sees almost all the Waiau and Mavora Rivers' base flow discharged through Manapouri Power Scheme into Deep Cove. Diversion at the Mararoa Weir prevents downstream movement of coarse sediment and deposition of fines in backwater and oxbow habitats in the lower river.

Large gravel-river habitats on the Southland plains are nationally important for black-billed gulls and black-fronted terns, with Southland holding about 30% and 10% of the national populations, respectively. The most significant populations are on the Aparima (21,000 black-billed gulls, 400 black-fronted terns) and Waiau rivers (11,000 black-billed gulls). Large populations of black-billed gulls (> 5% national population) are also present on the Mataura and Oreti Rivers. Numbers are thought to vary between rivers from year to year, as birds appear to use all four rivers opportunistically, nesting where they can find suitable bare gravel habitat. Black-fronted terns also seem to congregate to feed on mayfly rises, with up to 400 birds feeding on a rise in a river, although autumn roosting populations are generally about 100–200 birds in each river (K. Murray pers. comm.).

Southland										
Catchment number	Name	Type	Heritage value score	Euclidean distance	Total REC classes (166)	Cumulative % REC classes	Area (ha)	% Natural cover	% DOC	Special features and notes
871	Longbeach Creek	I	0.579	0.559	5	3.0	2366.6	97.4	26.6	Highly natural
253	Tahakopa River	I	0.393	0.465	18	10.8	31073.8	76.3	61.6	
267	Monowai River	I	0.241	0.301	52	35.5	27964.1	100.0	95.6	Natural upper catchment, threatened fish
278	Lill Burn	I	0.235	0.345	20	36.1	24985.7	75.4	62.2	
672	Muddy Creek	I	0.168	0.691	4	37.3	3819.1	90.4	81.7	Highly natural, no introduced fish
281	Pourakino River	I	0.084	0.271	30	45.2	24704.7	56.0	32.6	
491	Currans Creek	I	0.031	0.475	7	45.2	7361.7	45.1	31.3	RAMSAR, threatened fish and plants, Nat.Sign. bird pops
375	Waituna Creek	I	0.002	0.444	6	45.2	13865.9	16.7	9.7	RAMSAR, threatened fish, plants and Nat. Sign. bird pops
13	Upper Waiiau River	I	0.445	0.251	120	85.5	447873.9	101.0	94.3	T10, threatened plants, fish and birds
4	Waiiau River	II	1.315	0.118	152	94.6	821723.7	78.6	73.3	T10, threatened plants, Nat.Sign. bird pops
55	Aparima River	II	0.023	0.226	69	97.0	156478.4	23.4	16.7	Nat.Sign. bird pops

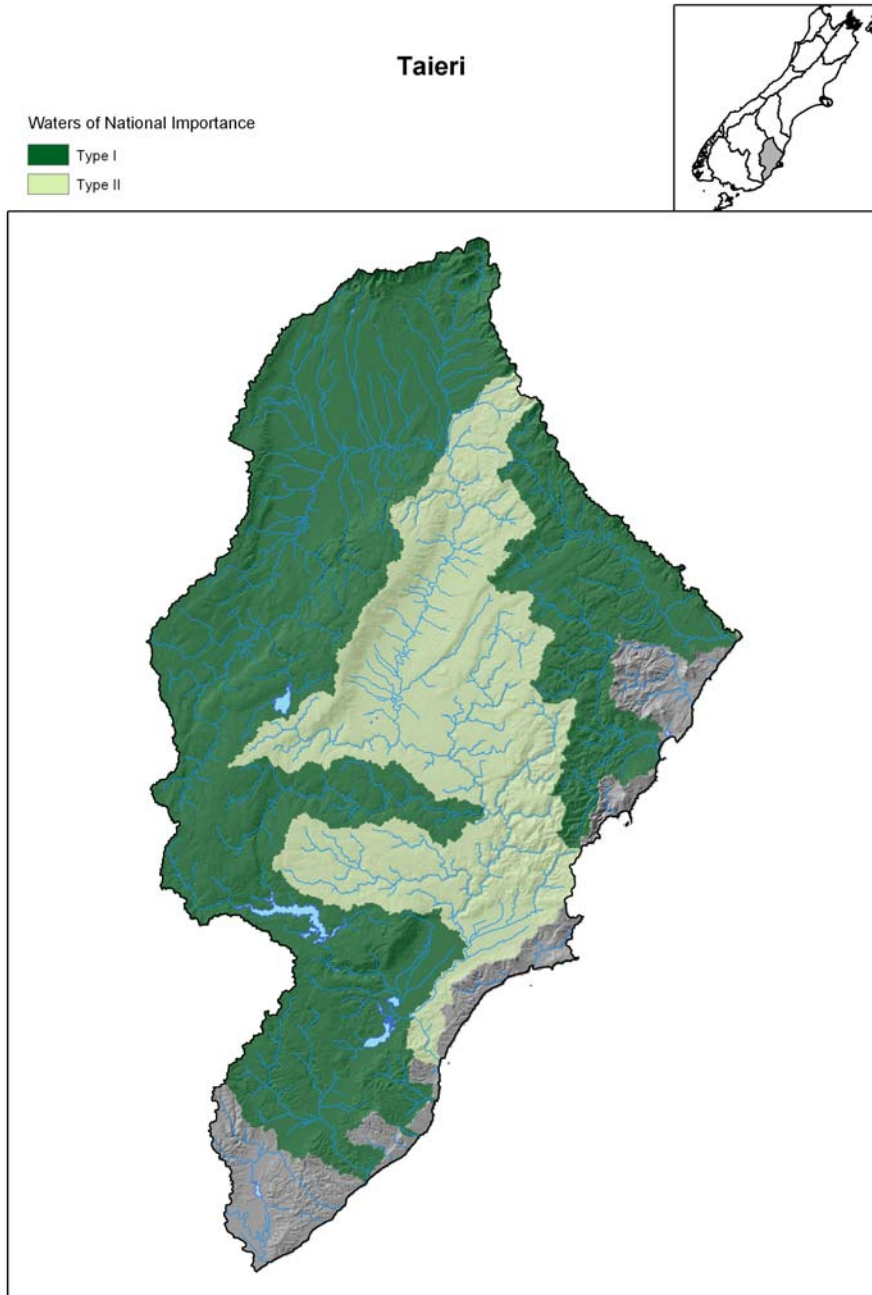
Currans and Waituna Creeks feed Waituna Lagoon, a RAMSAR wetland of international significance (Cromarty & Scott 1996), and are part of the Awarua wetland complex. This complex, a RAMSAR proposal (extension to the Waituna RAMSAR site), includes important habitat for various wader species including the nationally critical New Zealand dotterel. Both Currans and Waituna Creeks also provide important habitats for giant kokopu. Muddy creek is a smaller stream whose catchment is entirely within the Awarua wetland complex. It is the only significant stream flowing into Awarua Bay (an important winter flocking site for New Zealand dotterel) and it appears to be free of introduced fish.



Three species of non-migratory fish (*Galaxias* ‘southern’, *Galaxias gollumoides* and *Gobiomorphus breviceps*), that are found in Southland, are also present on Stewart Island (McDowall & Chadderton 1999; Waters & Wallis 2001b), whereas a fourth *Galaxias paucispondylus* is absent (L. Chadderton unpubl. data). The relatively early geological separation of Stewart Island, as temperatures warmed, presumably prevented the colonisation of the island by some common mainland invertebrate families such as Conoesucidae and Corydalidae: *Archichauliodes diversus* (Chadderton 1990; Leathwick et al. 2003). In addition, the caddisfly *Trillochorema rakiura* is known to be restricted to Stewart Island (Smith 2001), and there is a marked change in stonefly communities compared to those in Southland. Foveaux Strait also appears to have acted as a barrier to at least three diadromous fish, *Cheimarrichthys fosteri*, *Galaxias postvectis* and *Gobiomorphus hubbsi* which are present in mainland Southland (Chadderton 1990). The island’s relative isolation is also reflected in the absence of tree species from the genus *Nothofagus* (Wardle 1984)—two of which are widespread forest dominants in western Southland—and the presence of at least 25 endemic plant species (Wilson 1987; Patrick et al. 1992).

Stewart Island’s freshwater systems are most notable for their intact catchments and absence of introduced species (Chadderton 1990). The Freshwater and Rakeahua Rivers are also notable for their extensive floodplain communities that have retained their lateral connectivity with the main-stem rivers. Both also support significant populations of giant kokopu and long fin eels (Chadderton 1990, unpubl. data). They were the first- and fourth-highest ranked rivers in New Zealand by heritage score, reflecting the intact catchment vegetation and absence of human-induced disturbances including introduced fish species.

Stewart Island										
Catchment number	Name	Type	Heritage value score	Euclidean distance	Total REC classes (28)	Cumulative % REC classes	Area (ha)	% Natural cover	% DOC	Special features and notes
249	Freshwater River	I	6.099	0.218	23	82.1	31742.3	100.1	100.0	T10, no introduced fish spp. Threatened fish, highly natural, flood forest
430	Rakeahua River	I	3.676	0.106	15	85.7	10114.6	100.0	100.0	T10, no introduced fish spp. Threatened fish, highly natural, flood forest
472	Doughboy Creek	I	2.125	0.116	13	92.9	8008.0	99.4	100.0	T10, no introduced fish spp. Threatened fish, highly natural
396	Toitoi River	I	1.888	0.152	18	96.4	12248.3	100.1	84.4	T10, no introduced fish spp. Threatened fish, highly natural, flood forest



This unit encompasses rivers and streams flowing into the Pacific Ocean from the Shag River south to the Tokomairiro River. The Taieri River is the largest of these, and drains the extensive block of mountains and intermontane basins of eastern Otago. The unit supports a diverse and distinctive collection of non-diadromous fish (Waters & Wallis 2001b), i.e., *Galaxias anomalus* (in headwaters), *G. depressiceps* (widespread), *G. eldoni* (in lower reaches), *G. pullus* (west) and *Gobiomorphus breviceps* (widespread, and genetically distinct from populations in Southland and Waitaki: P. Smith pers. comm.). These galaxiids are all threatened species (Hitchmough 2002), and all have populations centred in the Taieri River catchment. The upper Taieri River is also notable for the Taieri Scroll Plain, a large inland meander floodplain feature of national significance. Large areas of the upper catchment are free of introduced fish (M. Neilson pers. comm.).

The lower Taieri-Waipori/Waihola catchments contain major populations of giant kokopu and Eldon's galaxiid. Lakes Waipori and Waihola are physico-chemically unique in New Zealand as shallow freshwater lakes whose water chemistry and zooplankton community structure is strongly influenced by periodic sea water intrusions (Schallenberg & Burns 2003).

Taieri										
Catchment number	Name	Type	Heritage value score	Euclidean distance	Total REC classes (80)	Cumulative % REC classes	Area (ha)	% Natural cover	% DOC	Special features and notes
210	Deep Stream	I	0.047	0.185	21	26.3	41177.7	2.5	28.5	Threatened fish
203	Waikouaiti River	I	0.016	0.150	29	43.8	42754.2	13.6	6.1	T10, threatened plants, fish and birds
139	Lake Waihola catchment	I	0.012	0.120	47	68.8	69558.8	13.0	14.0	Threatened fish, Nat.Imp.Site
1170	Big Creek	I	0.011	0.604	7	70.0	1278.9	50.7	29.4	T10
163	Shag River	I	0.006	0.138	43	83.8	54475.8	7.0	0.7	Threatened fish
507	Akatore Creek	I	0.006	0.484	15	83.8	6954.7	9.2	0.7	T10, threatened plants and fish
237	Kye Burn	I	0.003	0.239	24	85.0	34361.1	4.8	5.3	Threatened fish
214	Tokomairiro River	I	0.002	0.323	29	86.3	39743.2	11.1	0.2	Threatened fish
46	Upper Taieri River	I	0.008	0.121	50	96.3	191840.6	3.7	3.3	T10, threatened fish
9	Lower Taieri River	II	0.032	0.034	76	97.5	570283.3	6.2	6.9	T10, threatened fish, plants, birds

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