

TIMARU DISTRICT SNA SURVEY

TIMARU DISTRICT COUNCIL
SNA 83b and SNA 83c
- 3 DEC 2014
RECEIVED

Area Name: Orari River: SH79-SH1**Location:** 1461500E-5121800N to
1464000E-5112700N**Ecological District:** Low Plains**Surveyors:** Mike Harding**Property:** UCL/Ecan**Nearest Locality:** Geraldine-Orari**Area Size (ha):** 538**Survey Time:** 13 hours**Altitude (m):** 75-155**Survey Date:** 20-08-14
and 29-08-14**General Description:**

This SNA covers the Orari River between State Highway 79 at Orari Bridge and State Highway 1 at Orari. It includes the open bed of the river and the adjacent flood-protection plantings and rough vegetation on the river berms. Other sections of the Orari River, upstream and downstream have not yet been surveyed.

Plant Communities:

Three main plant communities are present: stonefield, gravelfield and sandfield on the open riverbed; planted exotic forest on the main river berms; and, gorse/broom scrub at other river berm locations. These plant communities are described separately below. Naturalized (exotic) species are indicated with an asterisk*.

Stonefield/gravelfield/sandfield:

This is an open and largely un-vegetated community that is frequently swept free by flood water. Species present at more stable sites are tree lupin*, narrow-leaved plantain*, yarrow*, white clover* and other naturalized herbs and grasses. The most important ecological value of the open riverbed is as habitat for birds, notably black-fronted tern.

Forest:

Forest on the river berms is a mixture of planted trees and naturalized woody vegetation. Planted trees (flood-protection plantings) are principally poplar* and crack willow*. Other canopy species commonly present are wattle*, sycamore*, radiata pine*, pohuehue, old man's beard* and occasionally Douglas fir*. Ivy* is present and in places abundant at the downstream end of the site.

Plant species in the forest sub-canopy are plum*, elderberry*, cabbage tree, *Clematis foetida* and old man's beard*. Occasional trees of kanuka, kowhai and lowland ribbonwood are present. Trees observed during this survey are regarded as 'significant trees' and are listed individually below.

Kowhai

The forest understorey is dominated by gorse*, broom* and blackberry. Other understorey species occasionally present are matipo, koromiko, *Coprosma propinqua*, laurel*, Japanese honeysuckle, spindle tree*, cotoneaster* and, on tree trunks, hound's tongue fern.

Ground-cover species are stinking iris*, prickly shield fern, male fern* and velvety nightshade*. Less commonly present are hen and chickens fern, necklace fern, hound's tongue fern, hemlock* and *Carex*

forsteri. Periwinkle* is common at the upstream end of the site. Species present at damper sites are *Carex secta* and occasionally swamp kiokio.

Species present on the forest margin or in forest-openings are bracken, *Hypolepis ambigua*, prickly shield fern, foxglove*, fleabane*, *Carex coriacea*, *Ranunculus ficaria** and the moss *Hypnum cupressiforme*.

Scrub:

Most un-forested parts of the stable river berms support a dense scrub dominated by gorse* and broom*. Other species present are emergent trees of elderberry*, crack willow* and sycamore*.

Birds/Fauna Observed:

Native birds observed throughout the river berm forests during this survey were fantail and grey warbler. Other species observed in the forest were silvereye, rifleman, white-faced heron and kingfisher.



kanuka

Native birds observed on or above the open riverbed were paradise shelduck, southern black-backed gull, spur-winged plover, harrier and black-fronted tern. Other native bird species recorded on this section of the Orari River in the most recent riverbed bird survey (2012) were: South Island pied oystercatcher, black shag and banded dotterel (Department of Conservation, *pers.comm.*).

Lizard fauna was not surveyed. However, it is likely that habitats with larger stones and boulders, such as that present on the river margins, support populations of common skink.

Notable Flora, Fauna and Habitats:

Important features of this area are the open riverbed as habitat for birds, including species listed by Robertson *et al* (2012): black-fronted tern (threatened; nationally endangered); banded dotterel (threatened; nationally vulnerable); and South Island pied oystercatcher (at risk; declining). These values are recognised by the listing of the Orari River bed as a Significant Site of Wildlife Interest (SSWI).

The river berm forests are not indigenous vegetation, though they do support a good number (c.20) indigenous plant species, including trees of kanuka, kowhai, lowland ribbonwood and cabbage tree. These tree species are now rare in the Low Plains Ecological District and are regarded as significant trees. The locations of these trees are marked on the aerial photograph and the details listed below.

Species	height (m)	dbh (cm)	Map ref: NZTM	Notes
kanuka	9	20.5	E1461807-N5121581	
kanuka	8; 6	24; 14.5	E1461910-N5121355	two trees close together
lowland ribbonwood	10	33	E1462110-N5121009	
kanuka	8	23.5	E1462738-N5119739	
kanuka	4	7.5; 7.0; 6.5	E1462321-N5118825	
lowland ribbonwood	c.15	c.45	E1462295-N5119417	
kowhai	c.15	11.5	E1462300-N5119425	
kanuka	10	17; 18.5	E1462657-N5117672	
lowland ribbonwood	c.10	c.15	E1462677-N5117011	
kowhai	12	36; 41.5	E1462937-N5115597	
kowhai	6		E1463119-N5114133	

The forested berms of the main lowland South Canterbury rivers (Rangitata, Orari, Te Moana and Opihi) provide the only large areas of forest habitat in this part of the Low Plains Ecological District. Fantail, grey warbler and a number of exotic birds are common throughout these forests. Also present are silvereye and rifleman (at the upstream part of the site). Black shag, white-faced heron and kingfisher were observed in the canopy or at the margin of these berm forests. Black shag is listed by Robertson *et al* (2012) as at risk (naturally uncommon).

The forested river berms provide low-altitude forest habitat that is linked to the forest patches at the foothills and upper plains. These forests also buffer and protect the lower reaches of the rivers. Although not covered by the Land Environments framework, the site lies adjacent to Level IV Land Environments that are listed as 'acutely-threatened'.

Notable Plant and Animal Pests:

Vegetation at this site is dominated by exotic species. Exotic species that pose the greatest threat to indigenous plant species in the berm forests are old man's beard, ivy and periwinkle. Other ubiquitous naturalized plant species, such as gorse, broom, willow and sycamore do provide habitat for some indigenous plant species. Animal pests were not surveyed. Possums are present, though no larger wild animals were observed.

Boundaries (buffering, fencing, adjoining plant communities and habitats):

This SNA is effectively two sites: the open riverbed and the forested river berms. The outer boundaries of the whole site are the stop banks. These boundaries are fenced. The site is surrounded by intensively developed farmland, mostly dairying, except at the upstream and downstream ends along the river (other parts of SNA 83).

Condition and Management Issues:

The main management issues are maintenance of the open riverbed bird habitat, protection of the significant indigenous trees in the river berm forests and containment of invasive plant pests such as old man's beard, ivy and periwinkle. Protection of riverbed bird breeding sites from disturbance and predation is also important.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA: Open Riverbed Bird Habitat

Primary Criteria	Rank	Notes
Representativeness	M/H	A good example of riverbed bird habitat typical of that remaining in the ecological district.
Rarity	H	Provides important habitat for threatened bird species: black-fronted tern and banded dotterel.
Diversity and pattern	M	Plant species diversity is probably similar to that originally present; bird species diversity is moderate, but probably lower than that originally present.
Distinctiveness/special features	M/H	Provides regionally important habitat for riverbed birds.
Other Criteria		
Size/shape	M/H	A relatively large area of habitat for the Low Plains Ecological District.
Connectivity	H	Is part of an intact river system.
Long-term Sustainability	M/H	Ecological values are compromised and threatened by introduced plant and animal pests.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA: River Berm Forests

Primary Criteria	Rank	Notes
Representativeness	L/M	Exotic vegetation that provides good riparian habitat for several indigenous species of forest birds.
Rarity	M	Supports scattered trees of species that are now rare in the ecological district (lowland ribbonwood, kowhai, kanuka).
Diversity and pattern	L/M	A much-reduced diversity of indigenous species, though relatively diverse (c.20 species) for this part of the ecological district.
Distinctiveness/special features	M	Provides locally important habitat for an at risk (naturally uncommon) bird species: black shag.
Other Criteria		
Size/shape	H	A very large area of forest bird habitat for this part of the ecological district.
Connectivity	H	An almost continuous corridor of forest habitat from the foothills to the coast.
Long-term Sustainability	M/H	Existing habitat values are likely to persist; has considerable potential for enhancement or restoration.

Final Consideration (of other matters: Section D, page B-19 of Timaru District Plan):

The open riverbed habitat is maintained by flood flows of the Orari River. It is threatened by encroachment of invasive plants, disturbance from vehicles, gravel extraction, reduced river flows and predators. The river berm forests have been established and maintained to protect adjacent land from flooding by the river. These forests coincidentally contain scattered indigenous trees, a number of ubiquitous indigenous plants (such as cabbage tree and prickly shield fern), provide useful habitat for indigenous forest birds and riparian species (such as black shag, white-faced heron and kingfisher). These forests, if managed differently, could provide much enhanced habitat for indigenous plant and animal species.

Discussion:

This area meets the District Plan criteria for a Significant Natural Area. Important features of the open riverbed part of the area are the habitat it provides for indigenous birds, including threatened and at risk species. Important features of the river berm forest part of the area are the presence of locally uncommon tree species and the habitat it provides for forest birds. Both provide relatively large areas of habitat for the Low Plains Ecological District and are connected along the river to other habitats inland and at the coast.



Hypolepis ambigua, Carex secta and prickly shield fern

Orari River

Keen Road

Tripp Settlement Road

Orari Back Road

Bennett Road

Rangitata-Orari Bridge Highway

Palmer Road

Arundel Belfield Road

Rangitata-Orari Bridge Highway

Seaward Road

83b

Legend

Significant Trees

- *Kunzea ericoides*
- *Plagianthus regius*
- *Podocarpus totara*
- *Sophora microphylla*

Meters

0 500 1,000

1:25,000





TIMARU DISTRICT SNA SURVEY

SNA 800a - g

Area Name: Lower Rangitata River
Location: 1463650E-5129530N to
1480200E-5105830N

Ecological District: Low Plains
Surveyors: Mike Harding

Property: UCL/Ecan

Locality: Arundel to Rangitata Huts

Area Size (ha): 648

Survey Time: 21 hours

Altitude (m): 2 to 185

Survey Dates: 08-08-14;
23-09-14 and 24-09-14

General Description:

These SNAs cover the true-right (west) side of the Rangitata River between Arundel-Rakaia Gorge Road at Arundel and the river mouth at Rangitata Huts. They include the open bed of the river and the adjacent flood-protection plantings and rough vegetation on the river berm. Other sections of the Rangitata River, upstream of Arundel and on the true-left (east) bank have not yet been surveyed.

Plant Communities:

Three main plant communities are present: stonefield, gravelfield and sandfield on the open riverbed; planted exotic forest on the main river berms; and, gorse/broom scrub at other river berm locations. Wetland and coastal scrub/flaxland communities are present at SNA 100e and 100f respectively. These plant communities are described below. Naturalized (exotic) species are indicated with an asterisk*.

Stonefield/gravelfield/sandfield:

This is an open and largely un-vegetated community that is frequently swept free by flood water. Species present at more stable sites are tree lupin*, broom*, gorse*, crack willow*, silver tussock (uncommon), narrow-leaved plantain*, yarrow*, white clover* and other naturalized herbs and grasses.

Additional species present at some stable stonefield sites are *Raoulia australis*, *Raoulia hookeri*, creeping pohuehue, *Epilobium brunnescens*, *Epilobium melanocaulon*, sheep's sorrel*, stonecrop*, wire moss and *Campylopus clavatus*. False tamarisk* is present in the lower reaches of the riverbed. The most important ecological value of the open riverbed is habitat for birds, notably black-fronted tern.



mossfield with Raoulia australis

Forest:

Forest on the river berms is a mixture of planted trees and naturalized woody vegetation. Planted trees (flood-protection plantings) are principally poplar* and crack willow*. Other canopy species present are sycamore*, radiata pine*, Douglas fir*, old man's beard*, pohuehue and native jasmine.

Plant species in the forest sub-canopy are cabbage tree, plum*, elderberry* and *Clematis foetida*. Occasional trees of kanuka, kowhai and a single totara tree are present. Trees of these species observed during this survey are regarded as 'significant trees' and are listed individually below.

The forest understorey is dominated by gorse*, broom* and blackberry. Other understorey species occasionally present are Khasia berry*, koromiko, matipo, Himalayan honeysuckle*, spindle tree and hound's tongue fern (on tree trunks).

Ground-cover species are prickly shield fern, bracken, *Hypolepis ambigua*, male fern*, *Blechnum penna-marina*, tutu, *Carex* sp., periwinkle* (in patches), velvety nightshade* and the moss, *Hypnum cupressiforme*. Species present at damper sites are swamp kiokio, *Carex secta* and toetoe (uncommon).



kanuka

Scrub:

Most un-forested parts of the stable river berms support a dense scrub dominated by gorse* and broom*. Additional species present at open sites within the scrub are creeping pohuehue, stonecrop*, sheep's sorrel*, mouse-ear hawkweed*, wire moss, *Hypnum cupressiforme*, *Racomitrium pruinosum*, *Brentelia pendula*, *Cladia aggregata*, silver tussock, *Rytidosperma* sp. and naturalized grasses.

Wetland (SNA 800e):

This small wetland lies at the edge of the river berm forest, just upstream from Rangitata Huts. It is dominated by flax. Other species present are cabbage tree, crack willow*, grey willow*, elderberry*, pohuehue, gorse*, *Coprosma robusta**, *Coprosma propinqua*, *Carex secta*, raupo, toetoe, oioi, *Juncus edgariae*, blackberry*, swamp kiokio and at the margin, bracken, broom* and Californian thistle*.



Flax-dominated wetland at edge of river berm forest (SNA 100e)

Coastal scrub/flaxland (SNA 800f):

This narrow strip of scrub lies between the bach settlement and the beach back-dune. It is dominated by flax and marsh ribbonwood. Other species present are gorse*, oioi and swamp kiokio. Other species present at the margins are tree lupin*, blackberry* and native bindweed.



coastal scrub/flaxland at Rangitata Huts (SNA 100f)

Birds/Fauna Observed:

Native birds commonly present throughout the river berm forests are fantail and grey warbler. Other species observed in or above the forest were silvereye, black shag, kingfisher, white-faced heron and harrier.

Native birds observed on or above the open riverbed were black-fronted tern, southern black-backed gull, black shag, spur-winged plover, paradise shelduck, welcome swallow and harrier. Other native bird species recorded on this section of the Rangitata River in the most recent riverbed bird survey (2009) were: Caspian tern (in the lower reaches), South Island pied oystercatcher and banded dotterel (Department of Conservation, *pers.comm.*).

Lizard fauna was not surveyed. However, it is likely that habitats with larger stones and boulders, such as that present on the river margins, support populations of common skink.

Notable Flora, Fauna and Habitats:

Important features of this area are the open riverbed as habitat for birds, including species listed by Robertson *et al* (2012): black-fronted tern (threatened; nationally endangered); banded dotterel (threatened; nationally vulnerable); Caspian tern (threatened; nationally vulnerable); South Island pied oystercatcher (at risk; declining); and black shag (at risk; naturally uncommon). These values are recognised by the listing of the Rangitata River bed as a Significant Site of Wildlife Interest (SSWI).

The river berm forests are not indigenous vegetation, though they do support a good number (c.18) indigenous plant species, including trees of kanuka, kowhai, totara and cabbage tree. These tree species are now rare in the Low Plains Ecological District and are regarded as significant trees. The locations of these trees are marked on the aerial photograph and the details listed below.

Species	height (m)	dbh (cm)	Map ref: NZTM	Notes
kanuka	6; 5	15; 10	E1464160-N5128193	two trees close together
kanuka	6	8.5; 10.8; 7	E1464185-N5127968	
totara	5	9	E1466393-N5124515	
kanuka	6; 7	11.2; 28.7; 8.1	E1473890-N5119101	two trees close together
kanuka	5	seven small trunks	E1474034-N5118947	
kowhai	8	17.3; 16.4	E1477178-N5115659	another tree nearby



young totara tree in river berm forest

The forested berms of the main lowland South Canterbury rivers (Rangitata, Orari, Te Moana and Opihi) provide the only large areas of forest habitat in this part of the Low Plains Ecological District. Fantail, grey warbler, silvereye and a number of exotic birds are common throughout these forests. Black shag, white-faced heron, harrier and kingfisher were observed in the canopy or at the margin of these berm forests. Black shag is listed by Robertson *et al* (2012) as at risk (naturally uncommon).

The forested river berms provide low-altitude forest habitat that is linked to the forest patches at the foothills and upper plains. These forests also buffer and protect the lower reaches of the rivers. Although not covered by the Land Environments framework, the site lies adjacent to Level IV Land Environments that are listed as 'acutely-threatened'. Braided riverbeds are an originally rare ecosystem (Williams *et al*, 2007).

Notable Plant and Animal Pests:

Vegetation at this site is dominated by exotic species. Exotic species that pose the greatest threat to indigenous plant species in the berm forests are old man's beard and periwinkle. Other ubiquitous naturalized plant species, such as gorse, broom, willow and sycamore do provide habitat for some indigenous plant and bird species. Animal pests were not surveyed. Possums are present, though no larger wild animals were observed.

Boundaries (buffering, fencing, adjoining plant communities and habitats):

This SNA is effectively four sites: the open riverbed; the forested river berms; the small coastal wetland (SNA 100e) and the small strip of coastal scrub/flaxland (SNA 100f). The outer boundaries of the whole site are the stop banks. These boundaries are fenced. The site is surrounded by intensively developed farmland, mostly dairying, except upstream along the river.

Condition and Management Issues:

The main management issues are maintenance of the open riverbed bird habitat, protection of the significant indigenous trees in the river berm forests and containment of invasive plant pests such as old man's beard, ivy and periwinkle. Protection of riverbed bird breeding sites from disturbance and predation is also important.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA: Open Riverbed Bird Habitat

Primary Criteria	Rank	Notes
Representativeness	M/H	A good example of riverbed bird habitat typical of that remaining in the ecological district.
Rarity	H	Provides important habitat for threatened bird species: black-fronted tern and banded dotterel.
Diversity and pattern	M	Plant species diversity is probably similar to that originally present; bird species diversity is moderate, but probably lower than that originally present.
Distinctiveness/special features	M/H	Provides regionally important habitat for riverbed birds.
Other Criteria		
Size/shape	M/H	A relatively large area of habitat for the Low Plains Ecological District.
Connectivity	H	Is part of an intact river system.
Long-term Sustainability	M/H	Ecological values are compromised and threatened by introduced plant and animal pests.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA: River Berm Forests

Primary Criteria	Rank	Notes
Representativeness	L/M	Exotic vegetation that provides good riparian habitat for several indigenous species of forest birds.
Rarity	M	Supports scattered trees of species that are now rare in the ecological district (totara, kowhai, kanuka).
Diversity and pattern	L/M	A much-reduced diversity of indigenous species, though relatively diverse (c.18 species) for this part of the ecological district.
Distinctiveness/special features	M	Provides locally important habitat for an at risk (naturally uncommon) bird species: black shag.
Other Criteria		
Size/shape	H	A very large area of forest bird habitat for this part of the ecological district.
Connectivity	H	An almost continuous corridor of forest habitat from the foothills to the coast.
Long-term Sustainability	M/H	Existing habitat values are likely to persist; has considerable potential for enhancement or restoration.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA: Wetland (SNA 100c)

Primary Criteria	Rank	Notes
Representativeness	M/H	A good example of indigenous vegetation typical of coastal wetland sites.
Rarity	M/H	Wetlands are an 'originally rare' ecosystem (Williams <i>et al</i> , 2007)
Diversity and pattern	M	Plant species diversity is moderate, though probably reduced from that originally present.
Distinctiveness/special features	M	The presence of a coastal species (oioi) is notable.
Other Criteria		
Size/shape	M/H	A moderate-large sized wetland for a lowland site; relatively well buffered by its location at the edge of the river berm forest.
Connectivity	M/H	Wetland habitat continues into the adjacent willow forest.
Long-term Sustainability	L/M	Control of crack willow, grey willow and gorse is urgently required to maintain the ecological values of the wetland.

Final Consideration (of other matters: Section D, page B-19 of Timaru District Plan):

The open riverbed habitat is maintained by flood flows of the Rangitata River. It is threatened by encroachment of invasive plants, disturbance from vehicles, gravel extraction, reduced river flows and predators. The river berm forests have been established and maintained to protect adjacent land from flooding by the river. These forests coincidentally contain scattered indigenous trees, a number of ubiquitous indigenous plants (such as cabbage tree and prickly shield fern), provide useful habitat for indigenous forest birds and riparian species (such as black shag, white-faced heron and kingfisher). These forests, if managed differently, could provide much enhanced habitat for indigenous plant and animal species.

Discussion:

These areas meet the District Plan criteria for Significant Natural Areas. Important features of the open riverbed part of the area are the habitat it provides for indigenous birds, including threatened and at risk species. Important features of the river berm forest part of the area are the presence of locally uncommon tree species and the habitat it provides for forest birds. Both provide relatively large areas of habitat for the Low Plains Ecological District and are connected along the river to other habitats inland and at the coast. The wetland and coastal scrub/flaxland are communities that are now rare in the District.

References Cited

Robertson, H.A.; Dowding, J.E.; Elliot, G.P.; Hitchmough, R.A.; Miskelly, C.M.; O'Donnell, C.F.J.; Powlesland, R.G.; Sagar, P.M.; Scofield, P.; Taylor, G.A. 2012. Conservation status of New Zealand birds 2012. *New Zealand Threat Classification Series 4*. Department of Conservation, Wellington

Williams, P.A.; Wiser, S.; Clarkson, B.; Stanley, M.C. 2007. New Zealand's historically rare terrestrial ecosystems set in a physical and physiognomic framework. *NZ Journal of Ecology* 31: 119-128.

Scientific names of species cited by common name in this report

(Note: this is not a complete species list; it is a list only of species cited by common name in this report)

Common Name Scientific name

(* = naturalised species)

blackberry*	<i>Rubus fruticosus</i>
bracken	<i>Pteridium esculentum</i>
broom*	<i>Cytisus scoparius</i>
cabbage tree/ti rakau	<i>Cordyline australis</i>
Californian thistle*	<i>Cirsium arvense</i>
cotoneaster*	<i>Cotoneaster</i> sp.
crack willow*	<i>Salix fragilis</i>
creeping pohuehue	<i>Muehlenbeckia axillaris</i>
Douglas fir/oregon*	<i>Pseudotsuga menziesii</i>
elderberry*	<i>Sambucus nigra</i>
false tamarisk*	<i>Myricaria germanica</i>
flax	<i>Phormium tenax</i>
fleabane*	<i>Coryza sumatrensis</i>
foxglove*	<i>Digitalis purpurea</i>
gorse*	<i>Ulex europaeus</i>
grey willow*	<i>Salix cinerea</i>
hemlock*	<i>Conium maculatum</i>
hen and chickens fern	<i>Asplenium gracillimum</i>

Himalayan honeysuckle*	<i>Leycesteria formosa</i>
hound's tongue fern	<i>Microsorium pustulatum</i>
ivy*	<i>Hedera helix</i>
Japanese honeysuckle*	<i>Lonicera japonica</i>
kanuka	<i>Kunzea ericoides</i>
Khasia berry*	<i>Cotoneaster simonsii</i>
koromiko	<i>Hebe salicifolia</i>
kowhai	<i>Sophora microphylla</i>
laurel*	<i>Prunus laurocerasus</i>
lowland ribbonwood	<i>Plagianthus regius</i>
male fern*	<i>Dryopteris filix-mas</i>
marsh ribbonwood	<i>Plagianthus divaricatus</i>
matipo/kohuhu	<i>Pitosporum tenuifolium</i>
mouse-ear hawkweed*	<i>Pilosella officinarum</i>
narrow-leaved plantain*	<i>Plantago lanceolata</i>
native bindweed	<i>Calystegia tuguriorum</i>
native jasmine	<i>Parsonsia heterophylla</i>
necklace fern	<i>Asplenium flabellifolium</i>
oioi	<i>Leptocarpus similis</i>
old man's beard*	<i>Clematis vitalba</i>
periwinkle*	<i>Vinca major</i>
plum*	<i>Prunus</i> sp.
pohuehue	<i>Muehlenbeckia australis</i>
poplar*	<i>Populus</i> sp.
prickly shield fern	<i>Polystichum vestitum</i>
radiata pine*	<i>Pinus radiata</i>
raupo	<i>Typha orientalis</i>
sheep's sorrel*	<i>Rumex acetosella</i>
silver tussock	<i>Poa cita</i>
spindle tree*	<i>Euonymus europaeus</i>
stinking iris*	<i>Iris foetidissima</i>
stonecrop*	<i>Sedum acre</i>
swamp kiokio	<i>Blechnum minus</i>
sycamore*	<i>Acer pseudoplatanus</i>
toetoe	<i>Cortaderia richardii</i>
totara	<i>Podocarpus totara</i>
tutu	<i>Coriaria sarmentosa</i>
velvety nightshade*	<i>Solanum chenopodioides</i>
wattle*	<i>Acacia</i> sp.
white clover*	<i>Trifolium repens</i>
wire moss	<i>Polytrichum juniperinum</i>
yarrow*	<i>Achillea millefolium</i>



Rangitata River

Legend
Significant Trees

- Kunzea ericoides
- Plagianthus regius
- Podocarpus totara
- Sophora microphylla



1:30,000

Rangitata River

Lewis Road

Withells Road

Ealing Moutaro Road

800b

Legend

Significant Trees

- *Kunzea ericoides*
- *Plagianthus regius*
- *Podocarpus totara*
- *Sophora microphylla*

Meters

0 500 1,000

Arundel Rangitata Road

Orari Rangitata Highway

1:25,000

Rangitata River

Rangitata Island Road

Dip Road

800c

Legend

Significant Trees

- *Kunzea ericoides*
- *Plagianthus regius*
- *Podocarpus totara*
- *Sophora microphylla*

Bay Road

Badham Road

Ealing Road

Storriers Road

Meters

0 500 1,000

1:25,000



Rangitata River

Bany Road

Rangitata Island Road

Bacham Road

800c

Lloyds Road

Ealing Road

800d

Wallace Road

Legend

Significant Trees

- *Kunzea ericoides*
- *Plagianthus regius*
- *Podocarpus totara*
- *Sophora microphylla*

Meters

0 500 1,000

1:25,000



Rangitata River



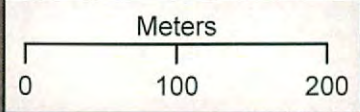
800e

800f

Legend

Significant Trees

- Kunzea ericoides
- Plagianthus regius
- Podocarpus totara
- Sophora microphylla



1:5,000