

**TIMARU DISTRICT**  
**SIGNIFICANT NATURAL AREAS**  
**SURVEY**

**AROWHENUA STATION**  
**(LYON PROPERTY)**



**Report prepared for the Timaru District Council by Mike Harding**  
**April 2008**

# TIMARU DISTRICT SIGNIFICANT NATURAL AREAS SURVEY

## PROPERTY REPORT

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### PROPERTY DETAILS:

**Owner:** ..... Isabel Lyon and Richard Walton (trustees)  
**Valuation Reference:** ..... 24680/139.00  
**Address:** ..... Station Road, Temuka  
**Location:** ..... On the north side of the Opihi River, southwest of Temuka  
**Ecological District:**..... Low Plains  
**TDC Land Type:** ..... Plains  
**Land Environment:** ..... L1 (southern lowlands)

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### ECOLOGICAL CONTEXT:

The property lies within the Low Plains Ecological District on a recent alluvial surface (low terrace) of the Opihi River. The original vegetation of this area would probably have been kanuka-kowhai forest/treeland or matagouri shrubland on recent alluvial surfaces and podocarp (matai-kahikatea) forest with a range of other species such as totara, narrow-leaved lacebark and lowland ribbonwood on older terraces and flats. Wetland vegetation would have been present along stream channels and in low-lying areas. The indigenous fauna would have been significantly more numerous and diverse, with a greater range of birds, lizards and invertebrates than is presently found in the area.

Indigenous vegetation on this property comprises a remnant of podocarp forest and smaller areas of wetland vegetation. The forest is the only substantial remnant of indigenous forest in this part of the ecological district and one of very few remnants in lowland Canterbury. It is isolated from other areas of indigenous forest.

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### SIGNIFICANT AREAS ON THE PROPERTY:

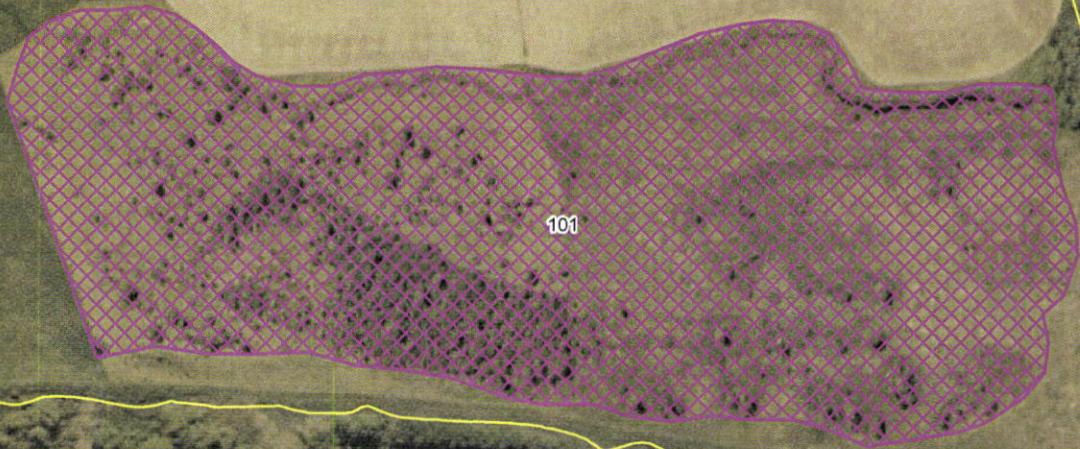
The property was surveyed as part of the District-wide survey of Significant Natural Areas in February 2008. One area, that includes all the remnants of indigenous forest and wetland in the southeast corner of the property, is regarded as significant when assessed against the District Plan criteria.

This SNA (Area 101) is illustrated on the attached aerial photograph and described in greater detail in this report. This SNA meets the ecological criteria in the Timaru District Plan (criteria i-vi, pages B18-B19). The SNA is considered to be sustainable in the long term (criterion vii, page B19), though will require conservation management to maintain its ecological values. The SNA is subject to confirmation by Council after regarding the matters listed under Final Considerations (pages B19-B20).

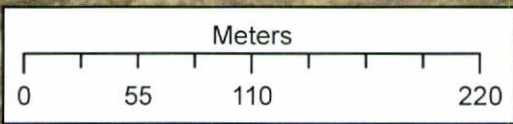
The implication of an area being listed as an SNA is that consent is required from Council for clearance by any means (including burning and spraying with herbicides) or over-planting. It places no obligation on the landowner to provide public access. To assist with the protection and management of any SNA, landowners can apply to Council for financial assistance. SNAs will eventually be listed in the District Plan. Any questions regarding the protection, management and use of SNAs should be directed to the District Planner.



Lyon Property (Arowhenua Bush)  
24680/139.00



101



1:3,621

# TIMARU DISTRICT SNA SURVEY

AREA 101

**Area Name:** Arowhenua Bush

**Location (central map reference):** K38: 704-596

**Ecological District:** Low Plains

**Surveyors:** Mike Harding and Fraser Ross

**Property:** Arowhenua Station (Lyon property)

**Nearest Locality:** Temuka

**Area Size (ha):** 7.8

**Altitude (m):** 25

**Survey Time:** 3½ hours

**Survey Date:** 09-02-08

## General Description:

Arowhenua Bush is a small remnant of one of the very few areas of podocarp-hardwood forest present on the Canterbury Plains at the time of European settlement. In 1849 the surveyor Charles Torlesse described 'Horowenua' as a "wood of 500 acres" (200 hectares) and as the only area of forest away from the foothills. Arowhenua Bush was a prominent landmark used to guide coastal steamers on their approach to Timaru. It appears that the nearest remnant of this type of forest was (and still is) Riccarton Bush in Christchurch.

Arowhenua was home to a resident population of Maori at the time of European settlement. The area was first taken up for grazing in 1853 by Major Alfred Hornbrook, the second grazing allotment in this part of the District. The station homestead was built at the western edge of the forest in 1854. The station was home to the first European child born in South Canterbury<sup>1</sup>.

Devastating fires in January 1863 reduced the extent of Arowhenua Bush substantially. Then, in 1975, westerly gales caused severe damage, blowing down many of the remaining trees. A visit to Arowhenua Bush by Fraser Ross and Colin Burrows in 1977 resulted in a description of the forest remnant and recommendations for management. Since that time, Fraser Ross has been closely involved in the protection and restoration of Arowhenua Bush with the support of the Lyon family and members of the local Forest and Bird branch, spending many hundreds of hours weeding, planting and caring for this forest remnant.

Forest management has included fencing of the core area of forest in 1981, planting of hundreds of locally-sourced seedlings of indigenous plants, weed control and watering. Fraser Ross has an intimate knowledge of the forest and its recent history. Fraser kindly accompanied me on my inspection of the forest, to show me the important features of the remnant and explain its management history, and commented on a draft of this report. This assistance has been invaluable in compiling this description.

## Plant Communities:

Arowhenua Bush comprises a relatively extensive area (by today's standards) of scattered to clumped indigenous trees and shrubs. The part of this forest/treeland that was fenced in 1981 now supports a quite densely vegetated area with remnant indigenous trees and a low canopy of well-established planted trees and shrubs. East of the scattered trees, at the southeast corner of the property, are two damp depressions supporting wetland vegetation. Along the northern edge of the area is shallowly-incised meandering stream (dry at the time of survey), which supports a healthy wetland plant community. These plant communities are described separately below. Naturalized (exotic) species are indicated with an asterisk\*. Planted species are indicated by a hatch#.

### Fenced core area of forest:

Most of this area supports a dense canopy of planted native species (some more than 25 years old) approximately 6 to 10m tall, with taller (remnant) trees of narrow-leaved lacebark and kowhai. Other canopy or emergent species are kahikatea (two trees), matai (two trees), lowland ribbonwood, pokaka, turepo, cabbage tree#, matipo#, native jasmine and pohuehue. Trunk diameters (at breast height) of the larger trees are narrow-leaved lacebark, 31-57cm; lowland ribbonwood, 40-45cm; kahikatea, 39cm and 18cm, matai, 26cm and 22cm; pokaka, 33cm and turepo, 26cm.

Forest restoration work has been occurring for so long and has been so successful, that it is difficult to distinguish between the original vegetation and the planted trees. Together they form a dense low canopy sufficiently tall and intact to have produced a shaded understorey similar in character to that present in some other forest remnants in the District. Species in the subcanopy and understorey are matipo, *Coprosma*

<sup>1</sup> Jubilee History of South Canterbury, Johannes Andersen, Whitcombe and Tombs Ltd, 1916.

*crassifolia*, *C. propinqua*, rohutu, shrubby mahoe, *Raukaua anomalus*, lancewood, weeping mapou<sup>#</sup>, koromiko<sup>#</sup>, *Calystegia tuguriorum*, *Clematis foetida*, *C. marata*, lawyer and leafless lawyer.

Groundcover species are prickly shield fern, *Pellaea rotundifolia*, hounds tongue fern<sup>#</sup>, necklace fern, *Cardamine* sp., *Hydrocotyle moschata*, *H. novae-zelandiae*, *Dichondra* sp., bittersweet<sup>\*</sup>, foxglove<sup>\*</sup> and seedlings of matipo, kahikatea (at protected sites), matai, kowhai, lowland ribbonwood, narrow-leaved lacebark, turepo, mahoe<sup>#</sup>, cabbage tree<sup>#</sup>, *Coprosma propinqua*, *C. rubra*<sup>#</sup> and native jasmine.

The western part of the fenced area is more open and, in places, damper. Additional species present here are flax<sup>#</sup>, rushes (*Juncus* sp.), kahikatea<sup>#</sup> saplings 3 to 4m tall and matai<sup>#</sup> saplings c.2m tall (planted more than 25 years ago).

#### Remaining area of forest:

This area supports scattered trees and shrubs with occasional clumps of trees and some planted trees and shrubs. The most common tree species present is narrow-leaved lacebark, including some large old specimens. Trunk diameters of the larger narrow-leaved lacebark trees range between 31 and 77cm.

Other trees present are kowhai (trunk diameters: 26 to 36cm), pokaka (26, 30 and 37cm), rohutu (15, 23 and 26cm), lowland ribbonwood<sup>#</sup>, a single old lancewood, one large elderberry<sup>\*</sup> tree and a crack willow<sup>\*</sup> tree.

The most common shrub species present is *Coprosma crassifolia*, including a particularly large specimen with a trunk diameter of 23cm. Other shrub species present are *Coprosma propinqua*, *C. rubra*, *C. rigida*, shrubby mahoe, matipo, *Melicope simplex*, weeping mapou, *Raukaua anomalus* and a few gorse<sup>\*</sup> bushes at the margin. Other species present are pohuehue (which is abundant in places), native jasmine, lawyer, leafless lawyer and a small population of dwarf mistletoe (on *Coprosma crassifolia*), though this cryptic species could be more common.

#### Wetland depressions:

These two shallow damp hollows are dominated by rushes: *Juncus gregiflorus* and *J. pallidus*? Other species present are pohuehue, pasture grasses, a single *Carex secta* and planted cabbage tree and flax.

#### Wetland along stream:

The margins of this ephemeral stream are dominated by *Carex secta*. Other species present are rushes (*Juncus gregiflorus* and *J. pallidus*?), a threatened species of nettle (*Urtica linearifolia*), thistles<sup>\*</sup>, pasture grasses<sup>\*</sup>, bittersweet<sup>\*</sup>, a stand of cabbage trees and, on the muddy substrate, the small fern, *Azolla filiculoides*.

#### **Birds/Fauna Observed:**

Native bird species observed during this brief inspection were fantail, grey warbler and harrier. Other native species observed here by Fraser Ross are silvereye, brown creeper, bellbird, rifleman (till 1986) and, in the vicinity, kereru and long-tailed bat (one in trees along the homestead drive). Other indigenous species observed by Fraser Ross are skinks, common copper butterfly, little blue/grey butterfly, native cockroach and native slug.

#### **Notable Flora, Fauna and Habitats:**

The most important feature of Arowheuna Bush is that it is the only remnant of this type of indigenous vegetation in this part of the Low Plains Ecological District and one of very few such remnants in Canterbury. It is especially significant as an, albeit battered, example of the type of forest that was present in lowland Canterbury prior to the widespread burning that accompanied human occupation. The main wetland supports one threatened plant species: *Urtica linearifolia* (threat status: gradual decline). The forested area provides suitable habitat for a threatened bird species: kereru (gradual decline), which has been recorded nearby. Several locally uncommon plant species are present in the forest: dwarf mistletoe, *Raukaua anomalus*, leafless lawyer and *Coprosma rubra*. Wetland and forest/treeland communities are now rare in the Low Plains Ecological District.

#### **Notable Plant and Animal Pests:**

The forest and wetlands are relatively free of aggressive plant pests, largely due to the intensive management of the area by Fraser Ross and others over recent years. Woody weeds observed are one elderberry tree, one

crack willow tree and scattered gorse bushes, all near the wetland/stream at the northwest edge of the forest. Weeds observed within the forest are bittersweet, foxglove, thistles and pasture grasses. The native, pohuehue, is common and in places abundant. This climber is aggressive at forest margins and can smother large trees. Animal pests were not surveyed, though rabbits and possums are present, and stoats and hedgehogs have been seen (Fraser Ross, *pers. comm.*).

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

The patches of forest and wetland within this area occupy most of the large fenced paddock at the southeast corner of the property. A core area of forest is securely fenced. Other parts of the area are grazed by sheep. The area is adjacent to planted exotic trees on berm lands of the Opihi River. The area is otherwise isolated from other areas of indigenous or tall exotic vegetation.

**Condition and Management Issues:**

The area of forest, and especially the core fenced area, is in the best condition that could be expected, despite the history of disturbance and its battered appearance. This is substantially due to the intensive management of the forest over the past 25 years. Continued management of the core fenced area and extension of that type of management to a larger area are the most important actions required for the long-term viability of this important forest remnant. Removal of the elderberry tree and control of the larger clumps of pohuehue (by cutting and treating the woody vines) are other actions that would benefit the area. In the long term it would be desirable, for the ecological integrity of the area, to restore indigenous vegetation to the areas of open pasture between the core area, scattered trees and wetlands. This would create a larger well-buffered area that would have greater ecological resilience to withstand future disturbance events. Consideration should also be given to providing protection from wildfire, perhaps by creating fire-retardant buffers around the margins of the area.

**Property Owner Comment:**

Isabel Lyon, who resides on the property, is very supportive of efforts to restore and protect this area, provided there is no obligation to make public access available. She is conscious of her late husband's wish to protect the forest and is interested in securing better protection for the forest remnant.

Richard Walton, the other trustee, is very conscious of the responsibility of the trustees to maximise the commercial value of the property and that duty dictates that they limit the values to be recognised to those that fall fully within the criteria and that the area should not be extended beyond the area identified.

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**ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:**

Primary Criteria	Rank	Notes
Representativeness	H	The best example of this vegetation type in this part of Canterbury.
Rarity	M/H	Supports a threatened species ( <i>Urtica linearifolia</i> : gradual decline) and several locally uncommon species. A rare community type.
Diversity and pattern	M/H	A relatively diverse range of communities (forest, treeland, wetland), though species diversity is less than that originally present.
Distinctiveness/special features	M/H	Represents the only occurrence of a number of indigenous woody plant species in this part of the ecological district, and the eastern distribution limit for these species in South Canterbury.
<b>Other Criteria</b>		
Size/shape	H	A large area for the ecological district.
Connectivity	L/M	The forest is isolated from other areas of indigenous forest; the wetlands are linked or close to other areas of wetland.
Long-term Sustainability	M	Ongoing and relatively intensive management will be required to maintain the ecological values of the area in the long term.

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

This area has been informally protected by the landowners for many years. The values of the area have been enhanced considerably by the intensive management of the area over the past 25 to 30 years. The presence of this remnant of forest is a considerable asset to South Canterbury and is of regional significance. It adds considerable amenity value to the property.

**Discussion:**

This area very easily meets the District Plan criteria for a Significant Natural Area. The most notable features are its role as the last remaining example of this forest type in the area, the presence of threatened and rare species, the habitat it provides for forest and shrubland birds, and the diversity of the communities present (forest, treeland, shrubland and wetland).

# TIMARU DISTRICT SNA SURVEY

## Wetland Record Form

### Wetland 101a

<b>Wetland name:</b> Arowhenua Bush ponds	<b>Date:</b> 9 February 2008
<b>Property:</b> Arowhenua Station	<b>GPS/Grid Ref:</b> K38: 706-596
<b>Altitude:</b> 20 m	<b>No. of plots sampled:</b>
<b>Location:</b> North side of Opihi River	<b>Approximate size (ha):</b>

<b>Classification: I System</b>	<b>IA Subsystem</b>	<b>II Wetland Class</b>	<b>IIA Wetland Form</b>
Palustrine		Ephemeral wetland	Basin

**Surveyors:** Mike Harding and Fraser Ross

Indicator	Indicator components	Specify and Comment	Score 0-5 <sup>1</sup>	Mean score
Change in hydrological integrity	Impact of manmade structures	no structures present	5	4.33
	Water table depth	probably reduced	4	
	Dryland plant invasion	pasture grasses present	4	
Change in physico-chemical parameters	Fire damage	no evidence of recent fire	5	4.67
	Degree of sedimentation/erosion	none evident	5	
	Nutrient levels	animal dung; fertiliser?	4	
	von Post index		n/a	
Change in ecosystem intactness	Loss in area of original wetland	probably slightly reduced	4	3.5
	Connectivity barriers	connections modified/lost?	3	
Change in browsing, predation and harvesting regimes	Damage by domestic or feral animals	grazed by sheep only	4	3.67
	Introduced predator impacts on wildlife	unaware of any control	2	
	Harvesting levels	no known harvesting	5	
Change in dominance of native plants	Introduced plant canopy cover	none	5	4
	Introduced plant understorey cover	pasture grasses	3	
<b>Total wetland condition index /25</b>				<b>20.2</b>

**Main vegetation types:** *Juncus gregiflorus*-*Juncus pallidus*? rushland.

**Native fauna:** no fauna observed

**Other comments:** Two small areas of rushland in shallow depressions near Wetland 101b and near a regionally important indigenous forest remnant (Arowhenua Bush).

Pressure	Rating <sup>2</sup>	Specify and Comment
Modifications to catchment hydrology	4	most of catchment modified
Water quality within the catchment	3	moderate
Animal access	2	uncultivated and grazed only by sheep
Key undesirable species	2	a number present in catchment
% catchment in introduced vegetation	4	nearly all catchment in introduced vegetation
Other pressures	3	within an intensively developed landscape
<b>Total wetland pressure index /30</b>	<b>18</b>	

Source: Clarkson *et al*, Handbook for monitoring wetland condition, Ministry for the Environment, August 2002.

<sup>1</sup> Assign degree of modification thus: 5=v. low/ none, 4=low, 3=medium, 2=high, 1=v. high, 0=extreme

<sup>2</sup> Assign pressure scores as follows: 5=very high, 4=high, 3=medium, 2=low, 1=very low, 0=none



# TIMARU DISTRICT SNA SURVEY

## Wetland Record Form

### Wetland 101b

<b>Wetland name:</b> Arowhenua Bush stream	<b>Date:</b> 9 February 2008
<b>Property:</b> Arowhenua Station	<b>GPS/Grid Ref:</b> K38: 704-597
<b>Altitude:</b> 20 m	<b>No. of plots sampled:</b>
<b>Location:</b> North side of Opihi River	<b>Approximate size (ha):</b>

<b>Classification: I System</b>	<b>IA Subsystem</b>	<b>II Wetland Class</b>	<b>IIA Wetland Form</b>
Riverine		Ephemeral wetland	Swale

**Surveyors:** Mike Harding and Fraser Ross

Indicator	Indicator components	Specify and Comment	Score 0-5 <sup>1</sup>	Mean score
Change in hydrological integrity	Impact of manmade structures	no structures present	5	3.67
	Water table depth	most probably reduced	3	
	Dryland plant invasion	pasture grasses common	3	
Change in physico-chemical parameters	Fire damage	no evidence of recent fire	5	4.33
	Degree of sedimentation/erosion	some evident	4	
	Nutrient levels	animal dung; fertiliser?	4	
	von Post index		n/a	
Change in ecosystem intactness	Loss in area of original wetland	probably slightly reduced	4	3.5
	Connectivity barriers	connections modified/lost?	3	
Change in browsing, predation and harvesting regimes	Damage by domestic or feral animals	grazed by sheep only	4	3.67
	Introduced predator impacts on wildlife	unaware of any control	2	
	Harvesting levels	no known harvesting	5	
Change in dominance of native plants	Introduced plant canopy cover	some present	4	3.5
	Introduced plant understorey cover	pasture grasses	3	
<b>Total wetland condition index /25</b>				<b>18.7</b>

**Main vegetation types:** *Juncus gregiflorus*-*Juncus pallidus*? rushland; *Urtica linearifolia* herbfield; cabbage tree treeland.

**Native fauna:** no fauna observed

**Other comments:** A small ephemeral stream channel near Wetland 101a and near a regionally important indigenous forest remnant (Arowhenua Bush).

Pressure	Rating <sup>2</sup>	Specify and Comment
Modifications to catchment hydrology	4	most of catchment modified
Water quality within the catchment	3	moderate
Animal access	2	uncultivated and grazed only by sheep
Key undesirable species	2	a number present in catchment
% catchment in introduced vegetation	4	nearly all catchment in introduced vegetation
Other pressures	3	within an intensively developed landscape
<b>Total wetland pressure index /30</b>	<b>18</b>	

Source: Clarkson *et al*, Handbook for monitoring wetland condition, Ministry for the Environment, August 2002.

<sup>1</sup> Assign degree of modification thus: 5=v. low/ none, 4=low, 3=medium, 2=high, 1=v. high, 0=extreme

<sup>2</sup> Assign pressure scores as follows: 5=very high, 4=high, 3=medium, 2=low, 1=very low, 0=none

### 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)	
bittersweet* .....	<i>Solanum dulcamara</i>
cabbage tree/ti rakau .....	<i>Cordyline australis</i>
crack willow* .....	<i>Salix fragilis</i>
dwarf mistletoe.....	<i>Korthalsella lindsayi</i>
elderberry* .....	<i>Sambucus nigra</i>
flax .....	<i>Phormium tenax</i>
foxglove* .....	<i>Digitalis purpurea</i>
gorse* .....	<i>Ulex europaeus</i>
hound's tongue fern.....	<i>Microsorium pustulatum</i>
kahikatea/white pine.....	<i>Dacrycarpus dacrydioides</i>
kanuka .....	<i>Kunzea ericoides</i>
koromiko .....	<i>Hebe salicifolia</i>
kowhai .....	<i>Sophora microphylla</i>
lancewood .....	<i>Pseudopanax crassifolius</i>
lawyer.....	<i>Rubus schmidtioides</i>
leafless lawyer.....	<i>Rubus squarrosus</i>
lowland ribbonwood.....	<i>Plagianthus regius</i>
mahoe/whiteywood .....	<i>Melicytus ramiflorus</i>
matagouri .....	<i>Discaria toumatou</i>
matai/black pine .....	<i>Prumnopitys taxifolia</i>
matipo/kohuhu .....	<i>Pittosporum tenuifolium</i>
narrow-leaved lacebark .....	<i>Hoheria angustifolia</i>
native jasmine .....	<i>Parsonsia</i> sp.
necklace fern .....	<i>Asplenium flabellifolium</i>
pohuehue .....	<i>Muehlenbeckia australis</i>
pokaka .....	<i>Elaeocarpus hookerianus</i>
prickly shield fern .....	<i>Polystichum vestitum</i>
rohutu .....	<i>Lophomyrtus obcordata</i>
shrubby mahoe .....	<i>Melicytus micranthus</i>
totara .....	<i>Podocarpus totara</i>
turepo .....	<i>Streblus heterophyllus</i>
weeping mapou .....	<i>Myrsine divaricata</i>