

TIMARU DISTRICT SIGNIFICANT NATURAL AREAS SURVEY

PROPERTY REPORT

PROPERTY DETAILS:

Owner: EH and CW Tripp (Orari Gorge Station).
Valuation Reference: 24660/014.00 and 24660/021.00.
Address: Orari Gorge Station, RD 21, Geraldine.
Location: The northern and eastern slopes of Ben Hope, between the Waihi and Orari rivers, north of Woodbury.
Ecological Districts: Orari and Geraldine ecological districts.
TDC Land Types: Hard Rock Hills and Downs.
Land Environments: Q2 (south-eastern hill country) and E3 (rolling foothills).

ECOLOGICAL CONTEXT:

Most parts of the property, on the slopes of Ben Hope and the associated foothills, lie within the Orari Ecological District. Areas on the lower gentler terraces associated with the Orari River lie within or on the boundary of the Geraldine Ecological District. The main landforms on the property are moderately-steep hill slopes, gentle toe slopes, incised stream valleys and river terraces and flats.

The original vegetation of lowland and montane parts of this area would have been predominantly podocarp-hardwood forest, with areas of mountain beech forest. Denser podocarp-hardwood (matai-totara-kahikatea-lowland ribbonwood) forest would have occupied older terraces and flats, and tall kanuka-kowhai forest would have been present on recently disturbed surfaces. Minor areas of matagouri-*Coprosma-Olearia* shrubland and small wetlands were likely to have been present on valley-floors, probably with associated areas of short tussockland. Areas above the natural timberline (above 900 m to 1000 m) would have supported low scattered shrubland, tall tussockland, herbfield and mossfield. 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 the property forms some of the most extensive and least disturbed indigenous forest in Timaru District. It is complemented by the forest protected within the nearby Orari Gorge Scenic Reserve. Notable are remnant stands of podocarp-hardwood forest and beech forest in the main valleys, and especially the podocarp-hardwood forest in Station Stream. Also notable are the size of some of the older podocarp trees, including a totara tree with a trunk diameter of 250 cm, matai (185 cm) and kahikatea (120 cm). The presence of regenerating beech (saplings) is interesting.

A good population of one threatened plant species is present: scrambling broom (*Carmichaelia kirkii*) (threat status: nationally endangered). In addition, populations of more than 20 locally-uncommon plant species are present on the property, including species not yet recorded by SNA surveys in the Orari Ecological District, including turutu (*Dianella nigra*), dwarf mistletoe (*Korthalsella lindsayi*) and supplejack (*Ripogonum scandens*).

Rifleman, an at-risk (declining) species, was observed in most SNAs on the property. Eastern falcon/karearea, a threatened (nationally vulnerable) species, was recorded at two locations, including a falcon exhibiting breeding behaviour. The mature trees and relatively large patches of forest provide good habitat for these species and other forest birds. The property lies close to the existing range of the South Canterbury population of long-tailed bat. This species is regarded as nationally-endangered.

SIGNIFICANT NATURAL AREAS ON THE PROPERTY:

The property was surveyed as part of the District-wide survey of Significant Natural Areas during January, February and March 2009. Nearly all parts of the property were visited and assessed. Twenty-eight areas, totalling approximately 535 hectares, are regarded as significant when assessed against the District Plan criteria.

Area No.	Area Name	Central grid reference	Aprox. size(ha)	Vegetation/habitat type
3	One Hundred Pound Bush	J37: 653-913	0.99	Podocarp-hardwood forest
78a	Station Stream	J37: 635-905	177.59	Podocarp-hardwood forest
78b	McLeod Stream	J37: 627-899	111.61	Podocarp-hardwood forest
625a	One Tree Hill North	J37: 649-906	1.78	Podocarp-hardwood forest
625b	One Tree Hill South	J37: 647-904	1.16	Podocarp-hardwood forest
627	McAtamneys	J37: 626-885	13.89	Podocarp-hardwood forest
628a	Bottom Tank Forest	J37: 647-912	1.15	Podocarp-hardwood forest
628b	Little Hill Forest	J37: 644-913	7.91	Podocarp-hardwood forest
628c	Bottom Station Hill	J37: 640-916	7.66	Podocarp-hardwood forest
629a	Slip Panel Stream	J37: 651-932	10.51	Podocarp-hardwood forest
629b	Slip Panel Stream	J37: 645-930	5.27	Podocarp-hardwood forest
629c	Slip Panel Stream	J37: 638-927	12.96	Podocarp-hardwood forest
629d	Slip Panel Stream	J37: 630-922	4.06	Podocarp-hardwood forest
631a	Southern Smiths Gully	J37: 642-934	2.15	Podocarp-hardwood forest
631b	Smiths Gully	J37: 645-938	12.23	Podocarp-hardwood forest; beech forest
631c	Ashbys Bush Face	J37: 648-940	9.35	Podocarp-hardwood forest
631d	Top Ashbys Bush	J37: 651-941	3.97	Hardwood Forest
631e	Bottom Ashbys Bush	J37: 654-934	4.81	Kanuka Forest
631f	Southern Smiths Gully	J37: 647-934	4.89	Podocarp-hardwood forest
633a	Oat Paddock Gully	J37: 648-944	13.17	Podocarp-hardwood forest; beech forest
633b	Lower Black Birch Stream	J37: 645-948	44.47	Podocarp-hardwood forest
633c	Mid Black Birch Stream	J37: 630-951	20.24	Podocarp-hardwood forest
633d	Upper Black Birch Stream	J37: 616-946	36.30	Hardwood forest
633e	Pinckneys Paddock	J37: 636-943	11.78	Podocarp-hardwood forest
633f	Bottom Spurs Paddock	J37: 640-941	0.56	Sedgeland-rushland-shrubland (wetland)
635a	West Bank Orari River	J37: 650-958	5.24	Hardwood forest
637a	Orari River Terrace	J37: 650-954	7.43	Podocarp-hardwood forest; wetland
637b	Orari River Face	J37: 647-959	2.12	Hardwood forest; scrub

Areas of indigenous vegetation and/or habitat on the property that are identified as Significant Natural Areas (SNAs) are illustrated on the attached aerial photographs and described in greater detail on the Area Inspection Forms in this report. Note that the boundaries of the SNAs are indicative, rather than precise. These areas meet the ecological criteria in the Timaru District Plan (criteria i-vi, pages B18-B19) and are considered to be sustainable in the long term (criterion vii, page B19). SNAs are 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. To assist with the protection and management of any SNA, landowners can apply to Council for financial assistance. It is expected that SNAs will eventually be listed in the District Plan by way of a notified plan change. Any questions regarding the protection, management and use of SNAs should be directed to the District Planner.

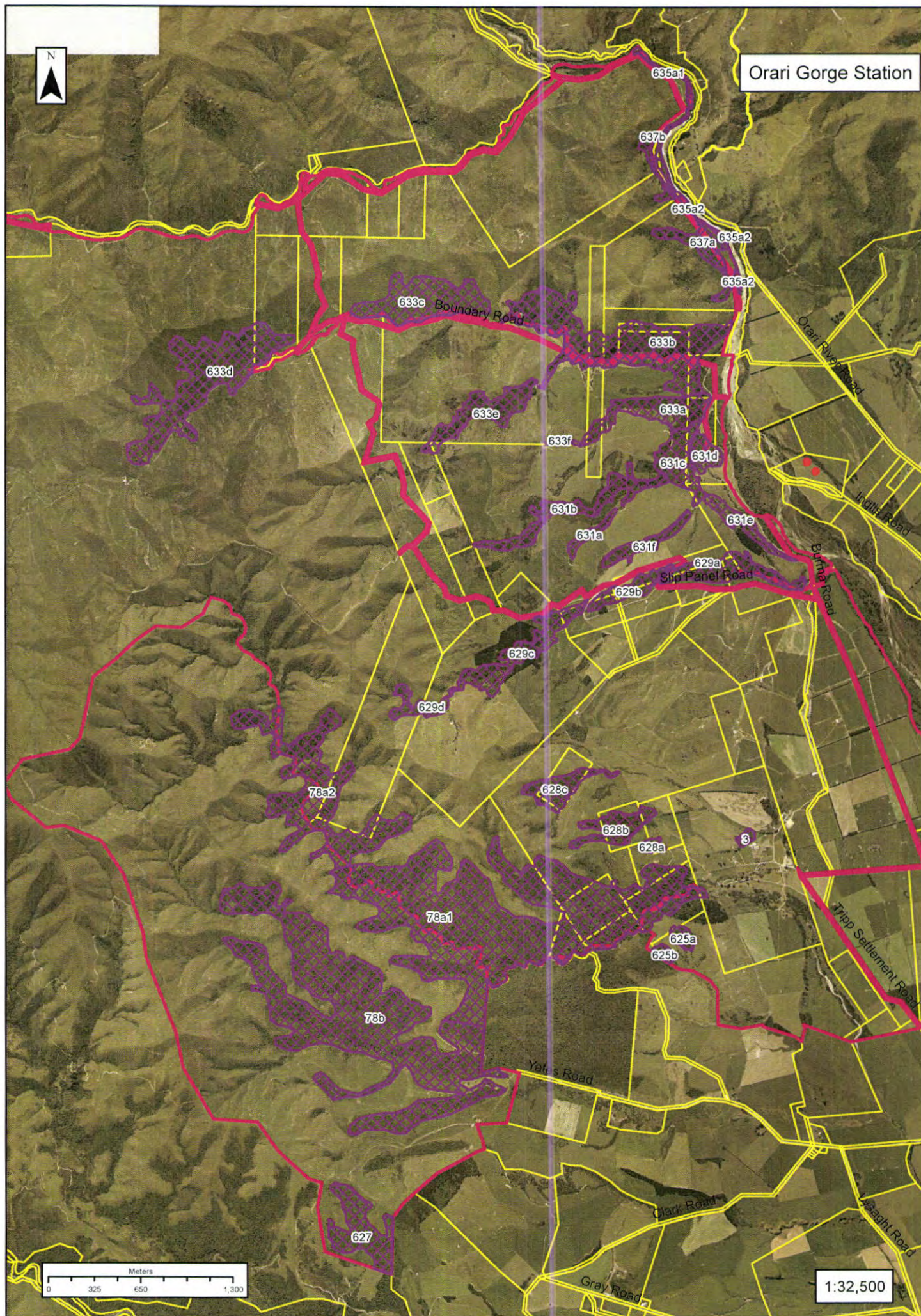
OTHER AREAS INSPECTED ON THE PROPERTY:

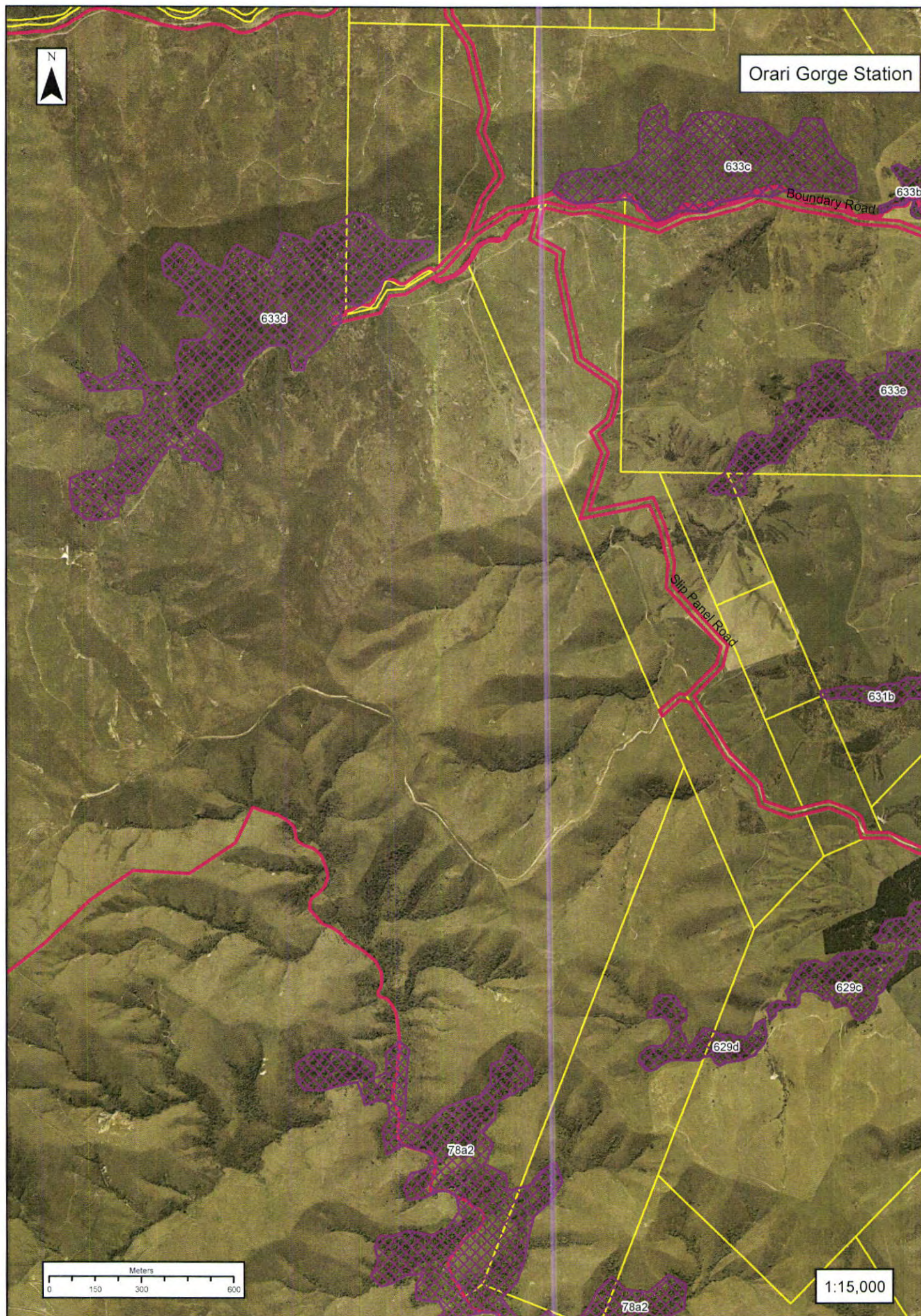
Other areas of indigenous vegetation and habitat on the property were inspected but are not regarded as significant when assessed against the criteria on pages B18-B20 of the Timaru District Plan. These are generally smaller or more modified areas of indigenous vegetation.

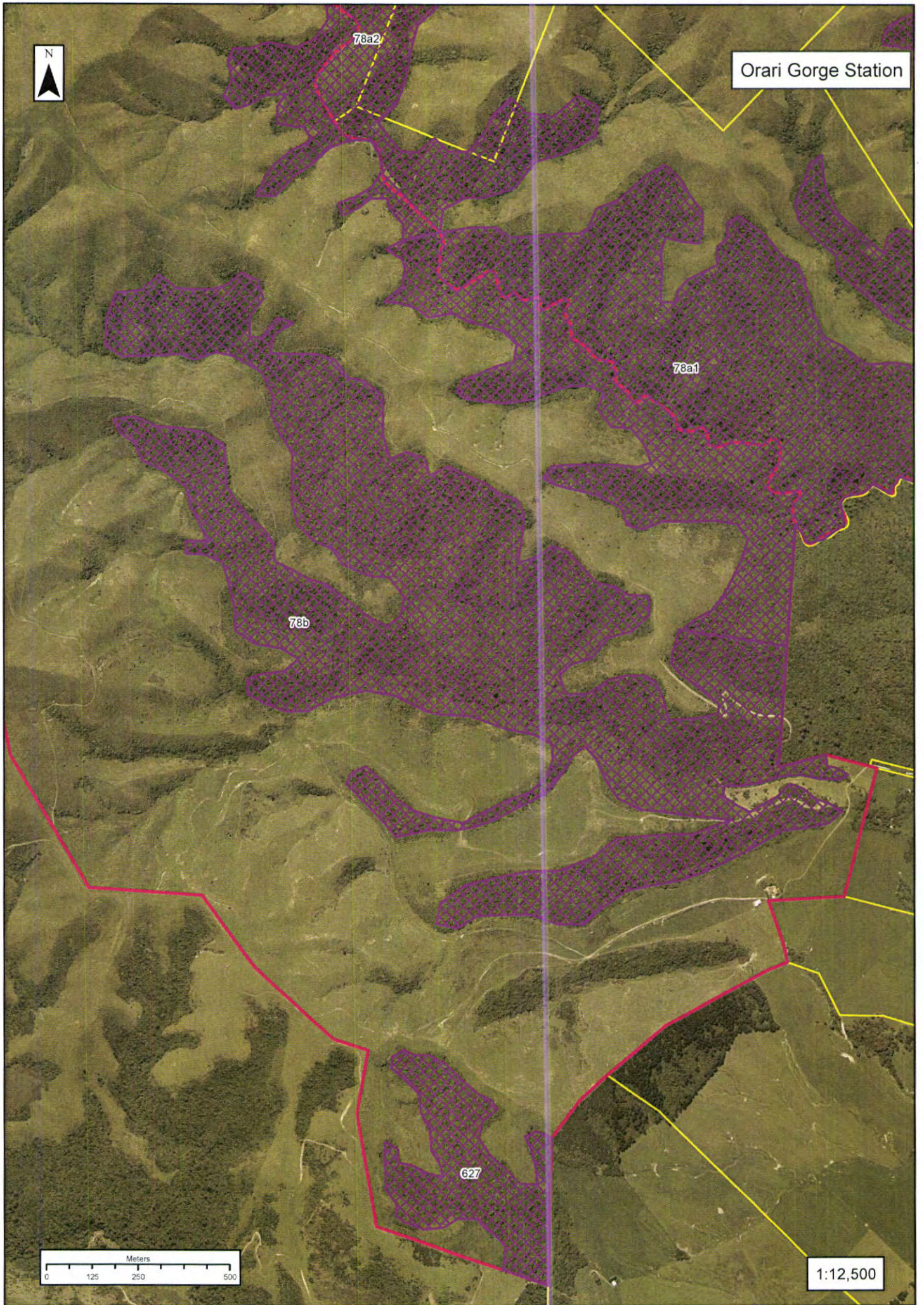
Failure of an area to meet the significance criteria does not necessarily mean that it is not important for nature conservation or the protection of indigenous biodiversity; it simply means that the area (as assessed at this time) does not meet the criteria in the Timaru District Plan. Some of these areas have considerable potential value and, if left alone, may eventually become significant.



Scrambling broom (*Carmichaelia kirkii*) in SNA 633e







Orari Gorge Station

78a2

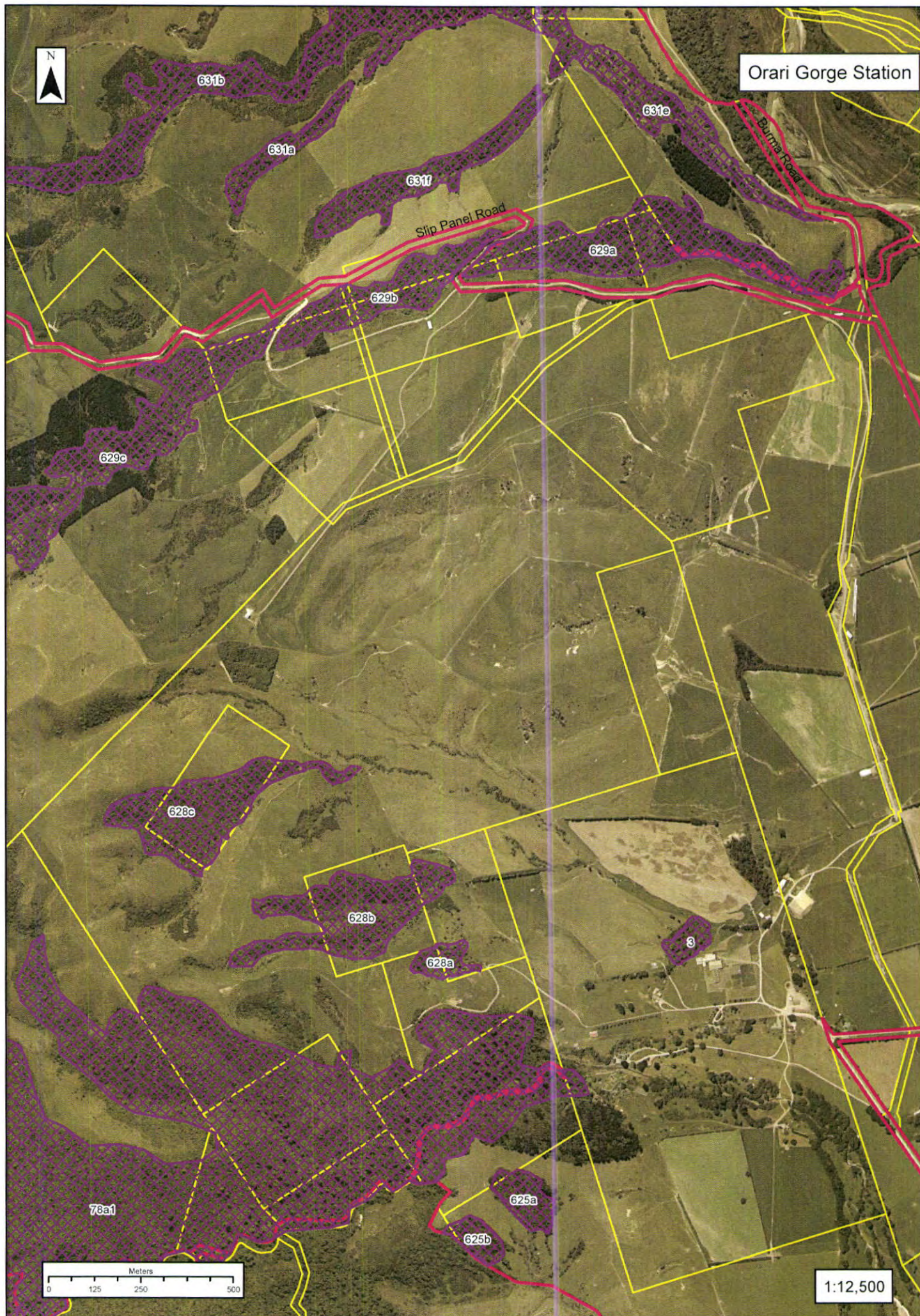
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TIMARU DISTRICT SNA SURVEY

AREA 3

Area Name: One Hundred Pound Bush	Property: Orari Gorge Station
Location (central map reference): J37: 653-913	Nearest Locality: Woodbury
Ecological District: Geraldine	Area Size (ha): 0.99 Altitude (m): 260
Surveyors: Mike Harding	Survey Time: 1 hour Survey Date: 29-01-09

General Description:

This SNA lies on an alluvial terrace near the farm buildings and north of the homestead of Orari Gorge Station. It is a small and somewhat battered remnant of the original forest that covered the flat low-altitude country of the Orari River terraces. The forest was apparently preserved from harm by the first owners of the property who threatened a fine of £100 to any person removing timber from the forest (Rosa Peacock, *pers.comm.*). The forest is now difficult to penetrate, as its margins are dominated by dense blackberry.

Plant Communities:

The main plant community present is podocarp-hardwood forest, comprising a central area of large old trees surrounded by dense low-stature vegetation dominated by exotic species. This plant community is described in detail below. Naturalized (exotic) species are indicated with an asterisk*.

The forest canopy of the central area is dominated by large emergent trees of kahikatea, totara and matai. Trunk diameters (cm at breast height) of the larger trees are: kahikatea, 65 to 95; totara, 135 to 250; and matai, 80 to 90. There is an old tree stump in the forest which is so large that it takes seventeen people to reach around its circumference (Rosa Peacock, *pers.comm.*).

Important canopy species are pokaka, broadleaf, lemonwood, kowhai, pohuehue and sycamore*. Other canopy species present are matipo, mahoe, fuchsia, cabbage tree, narrow-leaved mahoe and native jasmine.

Understorey species present are Khasia berry*, Darwin's barberry*, lemonwood, *Coprosma rigida*, *Coprosma rotundifolia*, *Coprosma crassifolia*, shrubby mahoe, matipo, mahoe, cherry laurel*, spindle tree* and saplings of matai.

Groundcover species present are prickly shield fern, hen and chickens fern, male fern*, black nightshade* and seedlings of kowhai, cabbage tree, totara, mapou, five-finger, *Coprosma rotundifolia*, sycamore* and elderberry*.

Species present in forest openings are blackberry*, Himalayan honeysuckle*, Chilean flame creeper*, bracken and *Hypolepis ambigua*.

The forest margin is variously dominated by dense blackberry*, Khasia berry*, hawthorn* and Darwin's barberry*. Also present are grey willow*, Himalayan honeysuckle*, prickly shield fern, gooseberry*, raspberry* and Chilean flame creeper*.

An area of forest with a more open understorey, surrounding a large totara tree, has the following canopy species: mapou, lemonwood and lancewood, with emergent totara, matai and kahikatea.

The forest understorey here supports mapou, Khasia berry*, lemonwood, narrow-leaved mahoe, mahoe, poataniwha, five-finger, shrubby mahoe, *Coprosma rhamnoides*, *Coprosma rotundifolia*, horopito, sycamore* and cherry laurel*.

Ground cover species are hen and chickens fern, *Libertia ixioides* and sparsely-distributed seedlings of some understorey and canopy species.

Birds/Fauna Observed:

Native birds observed during this brief survey were grey warbler, bellbird, fantail, kereru and rifleman. An old discarded (moulted) gecko skin was observed on the trunk of a totara tree.

Notable Flora, Fauna and Habitats:

Important features of this area are the number and size of the emergent podocarp trees, the location of the forest on a low-altitude terrace, the habitat the forest provides for forest birds, lizards and possibly long-tailed bat, and its role as a rare example of unlogged lowland forest in Canterbury.

Notable Plant and Animal Pests:

A substantial number of invasive weed species are present. Sycamore poses the greatest threat, as it is present in the forest canopy and can colonise shaded understorey sites. The forest margins have dense stands of blackberry, hawthorn, Darwin's barberry and Khasia berry. All these species have bird-dispersed fruits. The woody species pose a threat to other forest patches in the area. Cherry laurel, grey willow, spindle tree and Chilean flame creeper are also invasive. Animal pests were not surveyed.

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

This forest remnant is fenced from grazing and has apparently been protected from timber extraction since the area was first settled by Europeans. It is surrounded by pasture and farm buildings, though is not far from a number of areas of indigenous forest in nearby gullies, including the large and important Station Stream forest (SNA 78a).

Condition and Management Issues:

The margins and clearings of this forest are dominated by invasive weeds. A number of weed species are present and in places dominant in the forest understorey. The presence and dominance of invasive plant pests is the most critical management issue.

Property Owner Comment:

The owners are keen to control invasive weeds in this forest remnant.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	H	An unlogged although rather battered remnant of the original lowland podocarp-hardwood forest.
Rarity	H	Lowland podocarp-hardwood forest on an alluvial site is a substantially depleted and extremely rare forest type in Canterbury.
Diversity and pattern	M	Species diversity is reduced from that originally present.
Distinctiveness/special features	M/H	The number of tall podocarps and the very large totara trees are special features.
Other Criteria		
Size/shape	M/H	A moderate sized area (for an alluvial site in the Geraldine ED), with a good shape but not well buffered (from weeds).
Connectivity	M	Isolated from other areas of indigenous forest, but an important part of the network of fauna habitat in the area.
Long-term Sustainability	M	Some plant and animal pest control will probably be required to maintain its values in the long term.

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

This important area of forest has been strictly protected by several generations of the property owners. It is a very interesting, though somewhat battered, forest remnant which adds considerable amenity value to the property.

Discussion:

This area easily meets the District Plan criteria for a Significant Natural Area. It is an important remnant of the original lowland forest of the Canterbury Plains. Important features of the area are the number and size of the emergent podocarp trees, the location of the forest on a low-altitude terrace, the habitat the forest provides for forest birds, lizards and possibly long-tailed bat, and its role as a rare example of unlogged lowland forest in Canterbury.



SNA 3



SNA 625a

TIMARU DISTRICT SNA SURVEY

AREA 78a

Area Name: Station Stream

Location (central map reference): J37: 635-905

Ecological District: Orari

Surveyors: Mike Harding

Property: Orari Gorge Station

Nearest Locality: Woodbury

Area Size (ha): 177.59

Altitude (m): 280-700

Survey Time: 14 hours

Survey Date: January 09

General Description:

This large SNA covers a substantial portion of the catchment of Station Stream in the foothills between the Waihi and Orari rivers. It lies between the homestead and the mid-slopes of Ben Hope, covering an altitudinal range of more than 400 m. The SNA adjoins Orari Gorge Scenic Reserve on its lower southern boundary. A large part of the SNA, in the central valley, appears to be an intact remnant of the original foothills forests. This is reinforced by the owners' belief that this area of forest has never been logged apart from the removal of some matai trees from the lower valley (Rosa Peacock, *pers.comm.*). This SNA represents one of the largest areas of unlogged indigenous forest in South Canterbury. It is one of the most valuable SNAs in Timaru District and is regionally important. Although this SNA lies in Orari Ecological District, the vegetation on the lower altitude valley floor is similar to that typical of the adjoining Geraldine Ecological District.

Plant Communities:

The main plant community present is podocarp-hardwood forest. In the central and lower (unlogged) parts of the valley this community comprises large scattered podocarps (kahikatea, matai and totara) emergent over a dense hardwood canopy. Elsewhere, in the upper valley and higher on the valley sides, the forest canopy is dominated by hardwood species and, in places, younger podocarps. The forest also varies across its altitudinal range, from lowland forest in the lower valley to montane forest on the slopes of Ben Hope. Only parts of the area were traversed during the survey. The plant communities are described below for the different parts of the area traversed. Naturalized (exotic) species are indicated with an asterisk*.

Valley floor forest in the lower valley:

The forest canopy here is dominated by broadleaf, lancewood, pokaka, lemonwood, marbleleaf, matipo, five-finger, kaikomako, lowland ribbonwood, narrow-leaved lacebark and fuchsia, with tall emergent kahikatea, totara and matai. Trunk diameters (cm at breast height) of the larger trees are: kahikatea, 40-60; totara, 50-100; matai, 75-185, lancewood, 40-45; and pokaka, 80-90.

Understorey species present are yellowwood, five-finger, shrubby mahoe, weeping mapou, matipo, mahoe, *Coprosma crassifolia*, *Coprosma rhamnoides*, *Coprosma rotundifolia*, *Raukaua anomalus*, fuchsia, wineberry, horopito, poataniwha, lancewood, rohutu, Darwin's barberry*, bush lawyer, lawyer, leather-leaf fern, hanging lichen (*Usnea* sp.) and, in one location, cherry laurel*. Saplings of kahikatea and totara are present at some locations.

Toe slopes on the northern (damper) side of the valley support stands of wheki-ponga. Other species present here are soft tree fern, pate, white climbing rata, supplejack, *Leptopteris hymenophylloides*, water fern/mata, bush rice grass and *Blechnum chambersii*.

Groundcover species present are hound's tongue fern, prickly shield fern, hen and chickens fern, mountain kiokio, hanging spleenwort, *Pellaea rotundifolia*, *Clematis marata*, *Carex forsteri*, bush lily and seedlings of mapou, broadleaf, mahoe, native jasmine, clematis and Darwin's barberry*. At some locations there are dense patches of crown fern.

Species present in forest openings are *Coprosma rigida*, native jasmine, *Calystegia tuguriorum*, pohuehue and foxglove*.

Additional species present along the stream margin are mountain ribbonwood, narrow-leaved mahoe, Himalayan honeysuckle*, pate, koromiko, bush rice grass, pennywort, *Blechnum penna-marina*, *Blechnum fluviatile* and a small population of the rare herb *Australina pusilla*.

Terrace forest in the lower valley:

A variation of this forest type (a younger forest?) is present on the main terrace on the true-right (south) side of the lower valley near the homestead. The forest canopy here is dominated by broadleaf, five-finger, lancewood, lemonwood, lowland ribbonwood, kowhai, marbleleaf, wineberry, mapou, fuchsia, cabbage tree, matipo and kanuka with emergent young kahikatea, totara and pokaka. Other canopy species present are narrow-leaved mahoe, native jasmine, *Calystegia tuguriorum* and pohuehue. Trunk diameters (cm at breast height) of the larger trees are: kahikatea, 40-105; totara, 50-85; pokaka, 55-65; and lemonwood, 40-50. A number of exotic species are present, especially along the stream, including sycamore*, poplar*, Himalayan honeysuckle*, laburnum*, silver wattle*, cherry laurel* and Chilean flame creeper*.

Understorey species here are pate, *Coprosma rotundifolia*, *Coprosma rhamnoides*, wineberry, mahoe, shrubby mahoe, mapou, fuchsia, rohutu, *Lophomyrtus obcordata*, poataniwha, horopito, bush lawyer, *Clematis marata*, leather-leaf fern, hanging spleenwort and saplings of kahikatea,

Groundcover species present are hookgrass, bidibid, bush lily, *Carex forsteri*, prickly shield fern, hen and chickens fern, hound's tongue fern, *Lycopodium scariosum* and seedlings of kowhai, shining karamu, cabbage tree, lancewood, lowland ribbonwood and native jasmine.

Terrace forest on the true-left (north) side of the lower valley is dominated by sycamore*. However, there are some large remnant podocarps within this forest, including totara (with a trunk diameter of 101 cm), matai (60 cm) and kahikatea (103 and 177 cm). Other species present in this forest are cherry laurel*, mahoe, lemonwood, pate, wheki-ponga, prickly shield fern, hound's tongue fern, hen and chickens fern, pohuehue and Chilean flame creeper*.

Forest on dry (north-facing) slopes in the lower valley:

The canopy of young upper-slope forest in this area is dominated by kanuka, mapou, lancewood, broadleaf and kowhai. Additional species present on lower slopes are emergent totara, kahikatea, narrow-leaved lacebark and lowland ribbonwood. Trunk diameters (cm at breast height) of the larger trees are: kahikatea, 60-70; and totara, 60-120.

Important understorey species are *Coprosma rhamnoides* and yellowwood. Other understorey species present are five-finger, mahoe, mapou, lancewood, kowhai, lemonwood, matipo, broadleaf, poataniwha, horopito, shrubby mahoe, *Coprosma crassifolia*, *Raukaua anomalus*, rohutu, koromiko, mountain akeake, bush snowberry, Darwin's barberry*, saplings of totara and, rarely, scrub pohuehue.

Groundcover species present are hound's tongue fern, hen and chickens fern, *Blechnum vulcanicum*, mountain kiokio, *Pellaea rotundifolia*, prickly shield fern, bush lily, hookgrass, native jasmine and occasional seedlings of totara.

Additional species present near the stream (where there is an open forest margin) are fuchsia, pate, *Coprosma rotundifolia*, kiokio, *Blechnum fluviatile*, male fern*, pennywort, Himalayan honeysuckle*, grey willow* and Chilean flame creeper*.

Forest on damp (south-facing) slopes in the lower valley:

The forest canopy here is dominated by mahoe and pohuehue, with emergent large kahikatea, matai and totara. Trunk diameters (cm at breast height) of the larger trees are: totara, 180-208; and kahikatea, 105. Other canopy species present are fuchsia, wineberry and, on upper slopes, broadleaf, lancewood, five-finger, kowhai, lemonwood, mapou, *Calystegia tuguriorum* and Chilean flame creeper*.

Understorey species present are mahoe, *Coprosma robusta*, *Coprosma propinqua*, *Coprosma propinqua* x *robusta*, *Coprosma rotundifolia*, *Coprosma rhamnoides*, *Coprosma crassifolia*, mapou, lancewood, horopito, kowhai, lemonwood, elderberry*, bush lawyer, white climbing rata, supplejack, *Calystegia tuguriorum*, leather-leaf fern and hanging spleenwort.

Species dominant on the forest floor are prickly shield fern, *Pellaea rotundifolia*, *Polystichum richardii* and hound's tongue fern. Other groundcover species present are necklace fern, *Libertia ixioides* and seedlings of pate, sycamore*, Darwin's barberry*, elderberry*, wineberry, mapou, broadleaf, kowhai and *Coprosma* species.

Additional species present on the upper forest margin are kanuka, manuka, matipo, cabbage tree, hawthorn*, broom*, bracken, tutu, *Blechnum penna-marina* and Himalayan honeysuckle*.

Valley floor forest in the mid valley:

The forest canopy here contains kowhai, lowland ribbonwood, broadleaf, lancewood, marbleleaf, mahoe, pokaka, lemonwood, five-finger, wineberry and pohuehue, with large emergent kahikatea, totara and matai. Trunk diameters (at breast height) of the larger trees are: kahikatea, 120-145; matai, 75-130; broadleaf, 125; and pokaka, 80.

Important understorey species are *Coprosma rotundifolia* and poataniwha. Other understorey species present are *Coprosma rubra*, *Coprosma rhamnoides*, *Coprosma crassifolia*, pate, horopito, rohutu, turepo, mahoe, shrubby mahoe, mapou, kaikomako, Darwin's barberry*, white climbing rata, bush lawyer, supplejack, wheki-ponga, hanging spleenwort, leather-leaf fern and saplings of lemonwood, lowland ribbonwood, five-finger, matipo, mahoe, fuchsia, lancewood and matai.

Groundcover species present are prickly shield fern, crown fern, hound's tongue fern, hen and chickens fern, *Blechnum chambersii*, *Blechnum fluviatile*, *Blechnum penna-marina*, mountain kiokio, *Leptopteris hymenophylloides*, male fern*, bush lily, hookgrass, *Carex forsteri* and seedlings of kowhai, broadleaf, mahoe, lancewood, native jasmine, pohuheue, kahikatea, matai, clematis, *Clematis marata*, *Coprosma* species and Darwin's barberry*.

Additional species present along the stream margin are fuchsia, kanuka, *Coprosma propinqua*, grey willow*, Himalayan honeysuckle*, koromiko, tutu and *Calystegia tuguriorum*.

A variation of this forest type is present on the toe slopes in the mid-valley. Its low-stature canopy is dominated by fuchsia and mahoe, with broadleaf, wineberry, mapou, cabbage tree and large emergent kahikatea and matai. The forest sub-canopy is dominated by wheki-ponga and soft tree fern, and the understorey dominated by dense thickets of supplejack and masses of white climbing rata. Important groundcover species are crown fern and *Leptopteris hymenophylloides*. Other species commonly present are pate, *Coprosma rotundifolia*, hen and chickens fern, *Blechnum fluviatile*, *Blechnum chambersii*, *Laestrolepis glabella*, bush rice grass and bush lily.

Forest on damp (south-facing) slopes in the mid-valley:

The forest canopy here contains broadleaf, mapou, mahoe, marbleleaf, fuchsia and lemonwood with emergent kahikatea and pokaka on the lower slopes.

Understorey species present are *Coprosma rhamnoides*, *Coprosma rotundifolia*, supplejack, white climbing rata, bush lawyer, *Calystegia tuguriorum*, leather-leaf fern, soft tree fern, turepo, wheki-pomga, mahoe, mapou, lancewood, pokaka and saplings of kahikatea.

Groundcover species present are crown fern, hen and chickens fern, hound's tongue fern, *Leptopteris hymenophylloides*, mountain kiokio, *Blechnum procerum*, hookgrass, bush rice grass, bush lily and seedlings of kahikatea.

Additional species present on or near the upper forest margin are kanuka, manuka, cabbage tree, kowhai, lancewood, matipo, *Coprosma propinqua*, *Coprosma tayloriae*, Himalayan honeysuckle*, gorse*, broom*, matagouri, bracken, *Lycopodium scariosum*, tutu, Maori onion and narrow-leaved snow-tussock.

Forest on dry (north-facing) slopes in the mid- to upper-valley:

The forest canopy here is dominated by broadleaf, mahoe and kowhai. Other canopy species present are fuchsia, lemonwood, mapou, lancewood, lowland ribbonwood and marbleleaf. Emergent matai trees are present on the lower slopes.

Understorey species present are *Coprosma rotundifolia*, *Coprosma rhamnoides*, *Coprosma rigida*, *Coprosma crassifolia*, poataniwha, horopito, mahoe, narrow-leaved mahoe, mapou, *Calystegia tuguriorum*, pohuehue, hanging spleenwort and one small population of dwarf mistletoe (on mapou).

Groundcover species present are prickly shield fern, hound's tongue fern, hen and chickens fern, *Asplenium hookerianum*, *Asplenium richardii*, necklace fern, *Pellaea rotundifolia*, bush lily, hookgrass, and seedlings of mahoe, kowhai, broadleaf and mapou.

Species present on the lower (damper) slopes are pate, supplejack, *Blechnum chambersii*, *Blechnum fluviatile* and *Leptopteris hymenophylloides*.

Additional species present on the open upper spur or at the upper forest margin are cabbage tree, matipo, *Coprosma propinqua*, *Coprosma tayloriae*, Himalayan honeysuckle*, mountain akeake, bush lawyer, native jasmine, matagouri, broom*, koromiko, bracken and mistletoe (on *Coprosma propinqua*).

Forest on damp (south-facing) slopes the mid- to upper-valley:

The forest canopy here is dominated by lancewood, broadleaf and mahoe. Other canopy species present are mapou, mountain ribbonwood, marbleleaf, fuchsia, lemonwood, matipo, wineberry and pohuehue.

Understorey species present are mahoe, horopito, *Coprosma rhamnoides*, *Coprosma rotundifolia*, pate, mapou, marbleleaf, lancewood, pohuehue, bush lawyer, hound's tongue fern and leather-leaf fern.

The forest floor is dominated by prickly shield fern and hen and chickens fern. Other groundcover species present are mountain kiokio, pennywort and seedlings of mahoe and broadleaf. Species present at damper sites are narrow-leaved lacebark, *Blechnum chambersii* and *Blechnum fluviatile*.

Additional species present on the upper forest margin are koromiko, tutu, Himalayan honeysuckle*, narrow-leaved mahoe, *Coprosma tayloriae*, *Coprosma rigida*, mountain akeake, thousand-leaved fern, *Calystegia tuguriorum*, Chilean flame creeper* and flax.

Additional species present at lower altitude on an open dry spur are totara, kowhai, five-finger, mountain akeake, *Coprosma crassifolia*, poataniwha, koromiko, white-climbing rata, hanging spleenwort, clematis, native jasmine, bracken, bush lily, hookgrass, *Asplenium richardii*, *Polystichum richardii* and *Pellaea rotundifolia*.

Additional species present at the narrow valley bottom, near Station Stream, are kahikatea, supplejack, bush rice grass and crown fern.

Upper reaches of Station Stream:

Forest is present on damper slopes and gullies to near the headwaters of Station Stream, up to an altitude of approximately 700 m. This montane forest is dominated by broadleaf, fuchsia, marbleleaf, matipo, mapou, kowhai, mountain ribbonwood, lancewood, narrow-leaved mahoe, wineberry, lemonwood and pohuehue.

Other important species are mountain akeake, horopito, *Coprosma propinqua*, *Coprosma tayloriae*, koromiko, weeping mapou, bush lawyer, prickly shield fern, flax, tutu, mountain kiokio and thousand-leaved fern.

Birds/Fauna Observed:

Native birds observed during this survey were bellbird, fantail, silvereye, rifleman, grey warbler, kereru/NZ pigeon, shining cuckoo, tomtit, brown creeper, harrier, black shag and karearea/NZ falcon. Two black shags

were observed flying over the mid-valley. One falcon was observed on a dry spur at the bush edge in the upper valley. This falcon exhibited breeding/nesting behaviour, repeatedly attack-diving and calling to chase me from the spur crest.

Notable Flora, Fauna and Habitats:

Important features of this area are the presence of:

- an extensive area of unlogged forest
- large old podocarp trees (kahikatea, matai and totara)
- habitat for a threatened (nationally vulnerable) bird species, falcon, and an at risk (declining) bird species, rifleman.
- an extensive area of forest-bird habitat
- suitable habitat for long-tailed bat (especially the large old trees)
- a large number of species that are uncommon in the Orari Ecological District (*Australina pusilla*, crown fern, soft tree fern, wheki-ponga, dwarf mistletoe, *Lastreopsis glabella*, *Libertia ixioides*, *Lophomyrtus obcordata*, *Lycopodium scariosum*, shrubby mahoe, bush rice grass, rohutu, *Raukaua anomalus* and supplejack); and
- a diverse flora (94 indigenous species recorded).

These features make this SNA one of the most valuable in Timaru District and give it regional significance.

Notable Plant and Animal Pests:

The most important plant pests present are sycamore, Darwin's barberry and silver wattle. These invasive species are mostly confined to the lower valley, in the vicinity of the homestead, although Darwin's barberry is more widely distributed in the lower- and mid-valley. Sycamore forms extensive stands in the forest and on its margin on the true-left (north) side of the lower valley. Silver wattle is present as a dense stand on north-facing slopes adjacent to the forest on the true right (south) side of the lower valley. Darwin's barberry is present as shrubs and small trees along the forest margins at the down-valley (east) end of the forest and as seedlings and saplings in the forest understorey in the lower valley. The landowners have expended considerable effort controlling these weeds.

Other important plant pests present are Chilean flame creeper, cherry laurel and elderberry. Of these Chilean flame creeper poses the greatest threat, though is also the most difficult to control. These weeds are generally confined to the lower- and mid-valley. Himalayan honeysuckle is present throughout, on forest and stream margins and in forest openings. Grey willow is present alongside Station Stream. Occasional plants of gorse and broom are present along forest margins. These four species do not pose a significant threat to intact indigenous forest. The native climbing pohuehue (*Muehlenbeckia australis*) is also dominant in places, though does not appear to pose a significant threat to this extensive area of forest.

Animal pests were not surveyed. However, possum sign (droppings and scratchings) and pig sign (rooting and droppings) were observed at several locations.

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

This extensive area of forest occupies the valley floor and lower slopes of Station Stream where it (presumably) has been protected from earlier fires and subsequent timber-milling. The core area of unlogged forest is buffered by extensive areas of younger regenerating forest on upper slopes and in the upper valley. The forest is fenced, except for small parts of the forest in side gullies. This SNA is for the most part very well buffered by its size, location and fences. The only part of the forest that is not well buffered is in the lower valley, where the forest is vulnerable to invasion by naturalised trees (notably sycamore, silver wattle and Darwin's barberry).

This SNA adjoins Orari Gorge Scenic Reserve and SNA 78b along part of its southern boundary. It is otherwise separate from other areas of indigenous forest, though there are other areas of forest nearby. This SNA makes a very important contribution to the forest bird habitat of the foothills.

Condition and Management Issues:

Most parts of this SNA are in very good condition. The main management issues are containment or control of invasive weeds (especially sycamore, silver wattle and Darwin's barberry) at the forest margin in the lower valley and regular animal pest control (especially possums and pigs).

Property Owner Comment:

This forest is unlogged except for the removal of matai trees from the lower valley. Considerable effort has been expended controlling weeds. Most sycamore trees in the lower valley have been treated with herbicide over the past year. This stream catchment has been carefully protected to maintain water quality and to help protect the homestead area from flooding.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

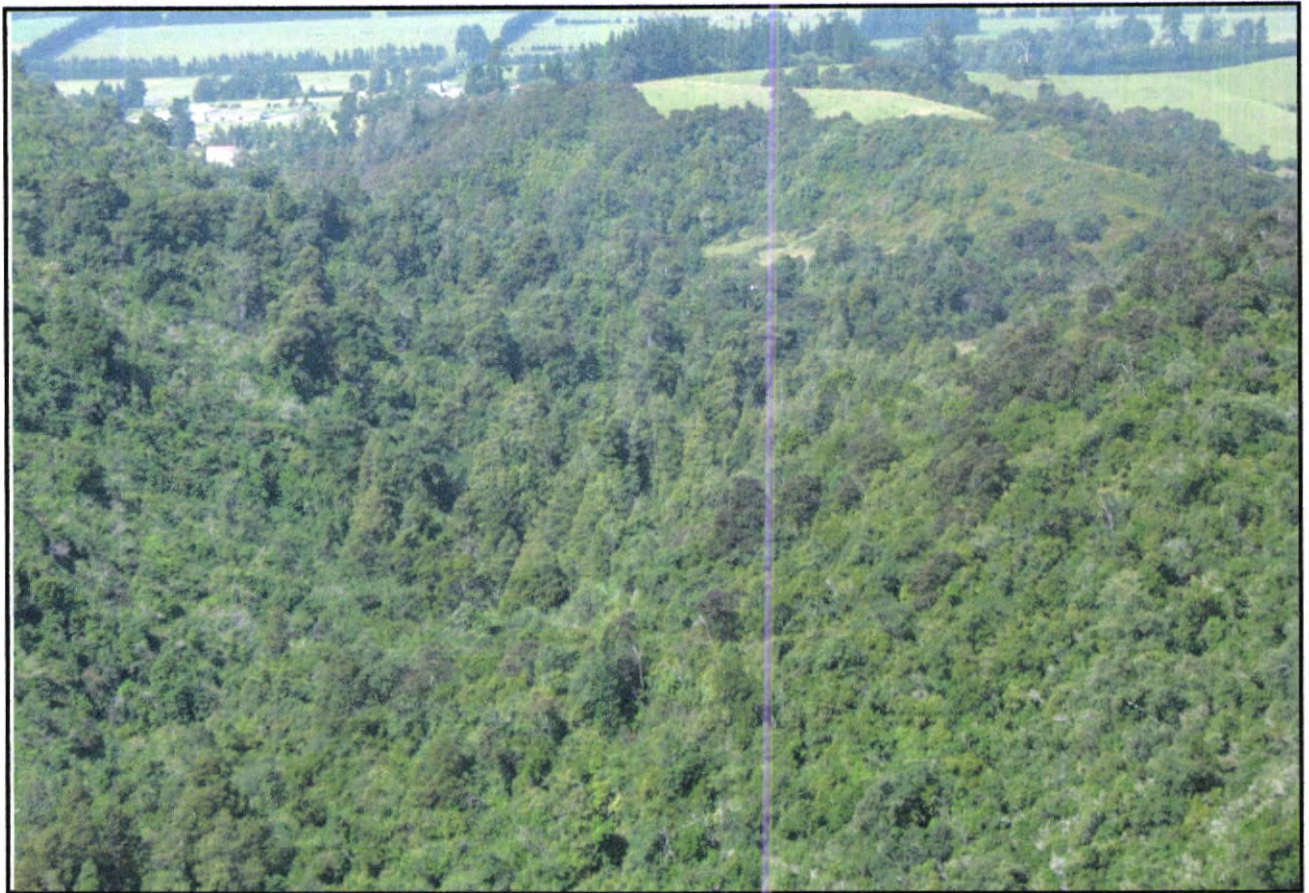
Primary Criteria	Rank	Notes
Representativeness	H	One of the best examples (along with Peel Forest Scenic Reserve) of podocarp-hardwood forest in the ecological district.
Rarity	H	Provides extensive high-quality habitat for at least three chronically-threatened bird species. Supports good populations of 14 plant species that are uncommon in the ecological district. Provides habitat that is suitable for a nationally-endangered species (long-tailed bat).
Diversity and pattern	H	Supports lowland to montane forest communities on a range of substrates and aspects over an altitudinal range of more than 400 m. Supports an exceptionally diverse flora and fauna: 94 indigenous plant species and 12 indigenous bird species.
Distinctiveness/special features	H	The presence of a large number of large old podocarp trees, the extent to which the forest covers (and protects) the Station Stream catchment, and the presence of dense stands of tree-fern and supplejack are special features.
Other Criteria		
Size/shape	H	An extensive area of forest for this ecological district and for Timaru District.
Connectivity	M/H	Adjoins and buffers Orari Gorge Scenic Reserve and makes a very important contribution to the forest bird habitat in the foothills.
Long-term Sustainability	M/H	Some weed and pest control will probably 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 extensive area of forest has been protected by the present landowners and earlier generations of the family since the area was first settled by Europeans. The owners have fenced the forest and undertaken weed and pest control to help protect the forest. The protection efforts of the landowners are commendable and the condition of the SNA is a credit to their vision and hard work.

Discussion:

This area very easily meets the District Plan criteria for a Significant Natural Area. It is one of the most extensive and intact areas of indigenous forest remaining in Timaru District and one of the more important areas of indigenous forest remaining in lowland Canterbury.



Lower part of Station Stream (SNA 78a)



Mid section of Station Stream (SNA 78a)

TIMARU DISTRICT SNA SURVEY

AREA 78b

Area Name: McLeod Stream

Location (central map reference): J37: 627-899

Ecological District: Orari

Surveyors: Mike Harding

Property: Orari Gorge Station

Nearest Locality: Woodbury

Area Size (ha): 111.61 **Altitude (m):** 310-600

Survey Time: 6 hours **Survey Date:** Jan-Feb 09

General Description:

This SNA covers the upper part of the McLeod Stream catchment on the southwest part of the property. It adjoins Orari Gorge Scenic Reserve and SNA 78a (Station Stream) at its eastern boundary. This SNA is similar to SNA 78a, though not as large and a little less diverse. It contains some large old podocarp trees, though appears to have a history of greater modification than the central part of the Station Stream SNA. This SNA includes large patches of indigenous forest on the south-facing slopes of its tributary gullies.

Plant Communities:

The main plant community present is podocarp-hardwood forest. This plant community is described in detail for the different parts of the SNA surveyed below. Naturalized (exotic) species are indicated with an asterisk*.

Valley floor/terrace forest in the lower- to mid- valley:

The lower part of this area is fenced and adjoins the Orari Gorge Scenic Reserve.

The forest canopy is dominated by lowland ribbonwood, pohuehue and emergent kahikatea and matai. Other canopy species present are totara, kowhai, wineberry, fuchsia, narrow-leaved lacebark, lemonwood, horopito, lancewood, five-finger, marbleleaf, *Calystegia tuguriorum*, and beside the stream, crack willow* and grey willow*. Trunk diameters (cm at breast height) of the larger trees are: matai, 100; kahikatea, 50-75; totara, 20-30; lowland ribbonwood, 40-50; kowhai, 40-50; and narrow-leaved lacebark, 40-45. Sycamore* trees and saplings are present at one location in the mid-valley (above the vehicle ford).

Understorey species present are pate, kowhai, mahoe, five-finger, *Coprosma rotundifolia*, *Coprosma rhamnoides*, *Coprosma rigida*, *Coprosma crassifolia*, poataniwha, mapou, weeping mapou, rohutu, kaikomako, marbleleaf, *Lycopodium varium*, bush lawyer, native jasmine, *Clematis foetida*, pohuehue and saplings of kahikatea.

Groundcover species present are prickly shield fern, hound's tongue fern, mountain kiokio, hen and chickens fern, *Blechnum penna-marina*, *Pellaea rotundifolia*, necklace fern, *Leptopteris hymenophylloides*, bush lily, bush rice grass, hookgrass, bidibid, *Clematis marata*, *Carex forsteri*, and seedlings of broadleaf, wineberry, lemonwood, horopito, *Coprosma rotundifolia*, totara and kahikatea. A small population of the uncommon herb, *Australina pusilla*, is present on the valley floor in the mid-valley.

Species present along the stream are koromiko, poroporo, *Blechnum fluviatile*, *Blechnum chambersii*, thousand-leaved fern, male fern*, *Libertia ixioides*, hairy pennywort and bittersweet*. Additional species present on the forest margin are kanuka, matipo, *Coprosma propinqua*, elderberry*, Himalayan honeysuckle*, *Hypolepis ambigua*, foxglove*, Darwin's barberry*, Chilean flame creeper* and blackberry*.

Forest on dry (north-facing) slopes in the lower- to mid-valley:

The forest canopy here is dominated by kowhai, broadleaf, mahoe, mapou, lemonwood, lancewood, bush lawyer and pohuehue. Other canopy species present are cabbage tree, lowland ribbonwood, fuchsia, horopito, narrow-leaved lacebark, native jasmine and scattered emergent kahikatea and totara.

Understorey species present are mapou, mahoe, kowhai, lemonwood, lancewood, *Coprosma rotundifolia*, *Coprosma rhamnoides*, *Coprosma propinqua*, *Coprosma rigida*, *Coprosma crassifolia*, native jasmine, hanging spleenwort and on dry spurs saplings of totara.

Groundcover species present are *Pellaea rotundifolia*, hound's tongue fern, hen and chickens fern, prickly shield fern, necklace fern, *Asplenium hookerianum*, *Asplenium richardii*, bush lily, hookgrass, *Carex forsteri*, black nightshade* and seedlings of lowland ribbonwood, mahoe, broadleaf, kowhai, totara and lancewood.

Species present in forest openings are Himalayan honeysuckle*, bush lawyer, *Calystegia tuguriorum*, pohuehue, elderberry*, prickly shield fern and bittersweet*.

Species commonly present on the forest margin are kanuka, cabbage tree, narrow-leaved mahoe, matipo, weeping mapou, *Coprosma propinqua*, *Coprosma crassifolia*, *Coprosma rigida*, *Coprosma tayloriae*, matagouri, mountain akeake, lawyer, bush lawyer, flax, bracken, hard fern, *Blechnum penna-marina*, blackberry*, scrub pohuehue and pohuehue.

An area of younger open (grazed) forest on north-facing slopes in the lower valley is dominated by kanuka and kowhai. Other species present here are lancewood, mahoe, *Coprosma propinqua*, *Coprosma crassifolia*, *Coprosma rigida*, *Coprosma rotundifolia*, *Coprosma rhamnoides*, bush lawyer, pohuehue, *Calystegia tuguriorum*, mistletoe (on kanuka and *Coprosma rigida*), prickly shield fern, necklace fern, bracken, pennywort, foxglove* and burdock*.

Forest on damp (south-facing) slopes in the lower- to mid-valley and tributary valleys:

The forest canopy is dominated by broadleaf, mahoe, mapou, lemonwood, marbleleaf, fuchsia and lancewood. Other canopy species present are lowland ribbonwood, kowhai, wineberry, narrow-leaved mahoe, pohuehue, *Calystegia tuguriorum*, bush lawyer and scattered emergent kahikatea, matai and totara.

Understorey species present are *Coprosma rhamnoides*, *Coprosma rotundifolia*, lancewood, horopito, marbleleaf, mahoe, pate, leather-leaf fern, pohuehue and bush lawyer.

Groundcover species present are hound's tongue fern, prickly shield fern, hen and chickens fern, *Asplenium richardii*, *Blechnum fluviatile*, *Hypolepis ambigua*, *Blechnum chambersii*, bush lily and seedlings of some canopy species.

Species present in forest openings are *Clematis foetida*, Himalayan honeysuckle*, Chilean flame creeper*, foxglove*, bittersweet*, lawyer, prickly shield fern, thousand-leaved fern, koromiko and black nightshade*. Additional species present on the forest margin are *Coprosma propinqua*, *Coprosma rigida*, *Coprosma tayloriae* and mountain akeake.

Montane forest in upper valley:

Forest is present on damper slopes and gullies to near the headwaters of McLeod Stream. This montane forest is dominated by broadleaf, fuchsia, marbleleaf, matipo, mapou, kowhai, mountain ribbonwood, lancewood, narrow-leaved mahoe, wineberry, lemonwood and pohuehue.

Other important species are mountain akeake, three-finger, horopito, *Coprosma propinqua*, *Coprosma tayloriae*, *Coprosma rigida*, scrambling fuchsia, koromiko, weeping mapou, bush lawyer, *Calystegia tuguriorum*, prickly shield fern, flax, mountain flax, tutu, bracken, mountain kiokio and thousand-leaved fern.

Occasionally present are cabbage tree, Chilean flame creeper*, bush snowberry, *Hypolepis ambigua*, *Blechnum fluviatile*, bidibid, golden speargrass, narrow-leaved snow-tussock and silver tussock.

Birds/Fauna Observed:

Native birds observed during this survey were bellbird, kereru, grey warbler, rifleman, fantail, silvereye, brown creeper, tomtit, shining cuckoo, harrier and black shag.

Notable Flora, Fauna and Habitats:

Important features of this area are the presence of large old podocarps (kahikatea, matai and totara) and regenerating podocarps, the habitat the area provides for at risk bird species (rifleman and black shag), the

potential habitat (especially large trees) for long-tailed bat (nationally endangered), the presence of several locally uncommon plant species (*Australina pusilla*, *Libertia ixioides*, *Lycopodium varium*, bush rice grass, rohutu and hard fern), the extensive area of good-quality forest bird habitat, and a diverse flora (82 indigenous plant species recorded).

Notable Plant and Animal Pests:

The only significant plant pest infestation observed is an area of sycamore in the mid-lower valley. While this infestation is not extensive, it is in thick forest at a relatively inaccessible location. Other notable plant pests are a small infestation of Darwin's barberry at the lower forest boundary, Chilean flame creeper at some forest margins, elderberry at scattered locations in the lower valley and willow trees (crack willow and grey willow) along the lower stream banks. Animal pests were not surveyed, though pig-rooting was observed at several locations.

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

This extensive area of forest is buffered by its location in the valley of McLeod Stream and on the south-facing slopes of the tributary valleys. The presence of large old podocarps indicates that the forest has been protected from widespread clearance and is at least in parts a remnant of the original forest. The boundaries of the forest are fenced, except in the upper catchment. The area adjoins Orari Gorge Scenic Reserve and SNA 78a (Station Stream) at its eastern boundary. This SNA makes a valuable contribution to the forest bird habitat of the foothills.

Condition and Management Issues:

Most parts of the forest are in good condition. Control of invasive plant pests, notably sycamore and Darwin's barberry, and continued animal pest (especially possums and pigs) control are the most important management issues.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	H	A good example of indigenous forest that is representative of the original vegetation of the ecological district.
Rarity	M/H	Provides good quality habitat for two at risk bird species (rifleman and black shag). Contains populations of six locally uncommon plant species. Provides suitable habitat for long-tailed bat.
Diversity and pattern	H	Supports lowland and montane forest communities over an altitudinal range of more than 300 m, including lowland valley-floor forest. Supports a very diverse flora and fauna: 82 indigenous plant species and 11 indigenous bird species.
Distinctiveness/special features	M/H	The presence of large old podocarp trees is a special feature.
Other Criteria		
Size/shape	H	An extensive area of forest for the ecological district.
Connectivity	M/H	Adjoins Orari Gorge Scenic Reserve and makes an important contribution to the network of forest bird habitat in the area.
Long-term Sustainability	M/H	Some weed and pest control 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 extensive area of forest has been protected by the present landowners and earlier generations of the family. The owners have fenced most parts of the forest and undertaken weed and pest control to help protect the forest values. The protection efforts of the landowners are commendable and the condition of the SNA is a credit to their hard work and vision.

Discussion:

This area very easily meets the District Plan criteria for a Significant Natural Area. It is one of the more extensive and intact areas of indigenous forest remaining in the area and one of the more important areas of indigenous forest remaining in Timaru District.



The upper part of SNA 78b

TIMARU DISTRICT SNA SURVEY

AREA 625a

Area Name: One Tree Hill North
Location (central map reference): J37: 649-906
Ecological District: Orari
Surveyors: Mike Harding and Gary Elwood

Property: Orari Gorge Station
Nearest Locality: Woodbury
Area Size (ha): 1.78 **Altitude (m):** 280-320
Survey Time: 2 hours **Survey Date:** 09-01-08

General Description:

This SNA lies on moderately steep south-facing slopes of the small hills south of lower Station Stream, within the farm's One Tree Hill paddock.

Plant Communities:

The plant community present is hardwood forest with a single large podocarp (matai) tree. This plant community is described below. Naturalized (exotic) species are indicated with an asterisk*.

The forest canopy is dominated by kanuka and lemonwood. Trunk diameters (at breast height) of the larger kanuka trees are between 30 and 40 cm. Other canopy species present are cabbage tree, mahoe, narrow-leaved mahoe, lancewood, five-finger, broadleaf, narrow-leaved lacebark, pohuehue and one large old matai tree (with a trunk diameter of 90 cm). One large radiata pine* tree is present at the edge of the forest.

Important understorey species are *Coprosma rotundifolia*, *Coprosma rhamnoides*, mahoe and mapou. Other, less common, understorey species are fuchsia, pate, bush lawyer, wineberry, *Coprosma propinqua*, *Xrobusta*, leather-leaf fern, black nightshade*, Darwin's barberry*, one mature tree and a patch of several young soft tree fern, saplings of kahikatea and a single hazelnut* tree.

Groundcover species present are prickly shield fern, hen and chickens fern, *Asplenium hookerianum*, *Asplenium richardii*, crown fern, *Blechnum fluviatile*, *Blechnum chambersii*, mountain kiokio, *Blechnum penna-marina*, hound's tongue fern, *Leptopteris hymenophylloides*, *Lastreopsis glabella*, male fern*, white climbing rata, bidibid, bush lily, hookgrass, sedge (*Carex* sp.) and seedlings of marbleleaf, mahoe, narrow-leaved mahoe, five-finger, cabbage tree, yellowwood, pokaka, lancewood, native jasmine, Darwin's barberry*, kahikatea and matai.

Species present in openings in the forest are thousand-leaved fern, *Hypolepis ambigua*, blackberry*, foxglove*, Chilean flame creeper* and rare seedlings of elderberry*. Additional species present on the forest margin are *Coprosma propinqua*, *Coprosma tayloriae*, *Calystegia tuguriorum* and larger Darwin's barberry* bushes.

Birds/Fauna Observed:

Native birds observed during this brief survey were bellbird, grey warbler, rifleman, fantail and kereru.

Notable Flora, Fauna and Habitats:

Important features of this area are the presence of a mature podocarp (matai) tree and podocarp (matai and kahikatea) seedlings, the presence of locally uncommon species (soft tree fern, crown fern and the fern *Lastreopsis glabella*), the diversity of the fern flora, the presence of an at risk bird species (rifleman), the location of the area close to a large (and regionally important) area of indigenous forest in Station Stream, and the contribution the area makes to fauna habitat in the wider area.

Notable Plant and Animal Pests:

The most important plant pest present is Darwin's barberry. There are larger bushes on the forest margin and smaller saplings and seedlings throughout the forest. Chilean flame creeper also poses a threat, though is presently confined to the forest margin and forest openings. Animal pests were not surveyed.

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

The area is buffered by its location in and around a shallow gully on a south-facing slope. It is not fenced from grazing, though grazing impacts are limited to localised browsing and trampling by cattle. The area lies close to the regionally important indigenous forest in Station Stream.

Condition and Management Issues:

The forest is in relatively good condition. The forest canopy is largely intact and there is regeneration of most canopy species, including matai and kahikatea. The forest understorey and groundcover are affected in places by grazing, though the density and diversity of indigenous species in the understorey suggest that grazing is presently having a limited or localized effect on the forest. Plant and animal pest control are probably the most important management issues.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M/H	A good example of indigenous vegetation typical of the ecological district and containing species representative of the original forest canopy, including podocarps (matai and kahikatea).
Rarity	M	Provides habitat for an at risk (declining) bird species: rifleman. Supports three locally uncommon plant species. The large matai tree may provide a roost site for bats.
Diversity and pattern	M	A relatively diverse plant community, though plant diversity is probably reduced from that originally present. It supports an especially diverse fern flora.
Distinctiveness/special features	M	The presence of a large old matai tree is a special feature.
Other Criteria		
Size/shape	M	A relatively small area, but with a good shape and well buffered.
Connectivity	M	Does not adjoin other indigenous vegetation, but lies close to other important areas and is an important part of a network of fauna habitat.
Long-term Sustainability	M	The ecological values of the area are likely to persist in the long term with some conservation management (pest control and grazing management).

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

This area of forest has been informally protected by the landowners. The steepness of the slopes within the area limits its potential for farm development.

Discussion:

This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the presence of a mature podocarp (matai) tree and podocarp (matai and kahikatea) seedlings, the presence of locally uncommon plant species, the diversity of the fern flora, the presence of an at risk bird species (rifleman), the location of the area close to a large (and regionally important) area of indigenous forest in Station Stream, and the contribution the area makes to fauna habitat in the wider area.

TIMARU DISTRICT SNA SURVEY

AREA 625b

Area Name: One Tree Hill South
Location (central map reference): J37: 647-904
Ecological District: Geraldine
Surveyors: Mike Harding

Property: Orari Gorge Station
Nearest Locality: Woodbury
Area Size (ha): 1.16 **Altitude (m):** 280-320
Survey Time: 1 hour **Survey Date:** 09-01-09

General Description:

This SNA lies on moderately steep southeast-facing slopes of the small hills south of lower Station Stream, within the farm's One Tree Hill paddock. The indigenous forest within this SNA extends onto the adjoining property.

Plant Communities:

The plant community present is hardwood forest. This plant community is described below. Naturalized (exotic) species are indicated with an asterisk*.

The forest canopy is dominated by kanuka and lemonwood. Trunk diameters (at breast height) of the larger kanuka trees range between 35 and 55 cm. Other canopy species are mapou, broadleaf, lancewood, marbleleaf, five-finger, mahoe, narrow-leaved mahoe, wineberry, fuchsia, bush lawyer, *Clematis foetida*, *Calystegia tuguriorum* and pohuehue. A large totara tree is present just across the boundary fence on the adjoining property.

Important understorey species are *Coprosma rotundifolia* and *Coprosma rhamnoides*. Other, less common, understorey species are fuchsia, kowhai, bush lawyer, pate, mapou, white-climbing rata, horopito and saplings of kahikatea and totara.

Groundcover species present are prickly shield fern, hound's tongue fern, hen and chickens fern, *Asplenium hookerianum*, *Asplenium richardii*, *Hypolepis ambigua*, crown fern, mountain kiokio, *Blechnum fluviatile*, *Blechnum procerum*, *Blechnum chambersii*, male fern*, *Leptopteris hymenophylloides*, filmy fern (*Hymenophyllum demissum*?), leather-leaf fern, bush lily, *Carex solandri*, white climbing rata, young plants of soft tree fern and seedlings of fuchsia, wineberry, mahoe, five-finger, broadleaf, native jasmine, supplejack, kahikatea, Darwin's barberry* and elderberry*.

Species present or more common in forest openings are black nightshade*, foxglove*, Himalayan honeysuckle*, poroporo and Chilean flame creeper*. Additional species present on the forest margin are matipo, *Coprosma crassifolia*, *Coprosma propinqua*, gorse* and shrubs of Darwin's barberry*.

Birds/Fauna Observed:

Native birds observed during this brief survey were bellbird, kereru, fantail and rifleman.

Notable Flora, Fauna and Habitats:

Important features of this area are the presence of podocarp (kahikatea and totara) saplings, the presence of locally uncommon species (soft tree fern, crown fern and supplejack), the presence of an at risk bird species (rifleman), the location of the area close to a large (and regionally important) area of indigenous forest in Station Stream, and the contribution the area makes to fauna habitat in the wider area.

Notable Plant and Animal Pests:

The most important plant pest present is Darwin's barberry. There are larger bushes on the forest margin and seedlings throughout the forest. Chilean flame creeper also poses a threat, though is presently confined to the forest margin and forest openings. Animal pests were not surveyed.

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

The area is buffered by its location on a southeast-facing slope and by forest on the adjoining property. It is not fenced from grazing, though grazing impacts are limited to localised browsing and trampling by cattle. The area lies close to the regionally important indigenous forest in Station Stream.

Condition and Management Issues:

The forest is in relatively good condition. The forest canopy is largely intact and there is regeneration of most canopy species, including regeneration of podocarp species that were originally present (kahikatea and totara). The forest understorey and groundcover are affected in places by grazing, though the density and diversity of indigenous species in the understorey suggest that grazing is presently having a minor effect on most parts of the forest. Plant and animal pest control are probably the most important management issues.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M/H	A good example of indigenous vegetation typical of the ecological district and containing species representative of the original forest canopy, including podocarps (kahikatea and totara).
Rarity	M	Provides habitat for an at risk (declining) bird species: rifleman. Supports three locally uncommon plant species.
Diversity and pattern	M	A relatively diverse plant community, though plant diversity is probably reduced from that originally present.
Distinctiveness/special features	L/M	The presence of podocarp saplings is a feature.
Other Criteria		
Size/shape	M	A relatively small area, but with a good shape and well buffered.
Connectivity	M	Adjoins other indigenous vegetation on one boundary, lies close to other important areas and is an important part of a network of fauna habitat.
Long-term Sustainability	M	The ecological values of the area are likely to persist in the long term with some conservation management (pest control and grazing management).

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

This area of forest has been informally protected by the landowners. The steepness of the slopes within the area limits its potential for farm development.

Discussion:

This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the presence of podocarp (kahikatea and totara) saplings, the presence of locally uncommon species (soft tree fern, crown fern and supplejack), the presence of an at risk bird species (rifleman), the location of the area close to a large (and regionally important) area of indigenous forest in Station Stream, and the contribution the area makes to fauna habitat in the wider area.

TIMARU DISTRICT SNA SURVEY

AREA 627

Area Name: McAtamneys (Paddock 20)
Location (central map reference): J37: 626-885
Ecological District: Orari (boundary of Geraldine)
Surveyors: Mike Harding

Property: Orari Gorge Station
Nearest Locality: Woodbury
Area Size (ha): 13.89 **Altitude (m):** 320-420
Survey Time: 1½ hours **Survey Date:** 22-01-09

General Description:

This SNA lies on moderately-steep slopes in a southeast-facing gully and on an adjacent gentle terrace at the southeast corner of the property. The forest in this SNA is contiguous with an area of similar forest on the adjoining property (McAtamney's SNA 607d). The area lies on the boundary of the Orari and Geraldine ecological districts.

Plant Communities:

Two main plant communities are present: podocarp-hardwood forest on the slopes and podocarp forest on the lower-altitude stream terrace. These plant communities are described in detail below. Naturalized (exotic) species are indicated with an asterisk*.

Podocarp-hardwood slope forest:

The forest canopy on the hill slopes is dominated by mahoe and mapou. Other canopy species present are broadleaf, kowhai, lemonwood, lancewood, fuchsia, cabbage tree and pohuehue, with scattered emergent kahikatea and totara.

Coprosma rotundifolia is the most common understorey species present. Other understorey species are mapou, lemonwood, horopito, marbleleaf, wineberry, *Coprosma rhamnoides*, bush lawyer, hanging spleenwort and saplings of kahikatea.

Groundcover species present are prickly shield fern, *Polystichum richardii*, *Asplenium hookerianum*, *Asplenium richardii*, hound's tongue fern, *Blechnum fluviatile*, *Pellaea rotundifolia*, *Lastreopsis glabella*, male fern* and seedlings of mahoe, lancewood, kowhai, broadleaf, native jasmine and pohuehue.

Species present at damper sites are pate, wheki-ponga and *Blechnum chambersii*. Species present in forest openings are pennywort, *Hypolepis ambigua* and nettle. An additional species present on the forest margin is *Coprosma pinquua*.

Podocarp terrace forest:

The canopy of the terrace forest is dominated by fuchsia, with emergent kahikatea, matai, totara and pokaka. Other canopy species present are marbleleaf, wineberry, kanuka, lancewood, narrow-leaved lacebark, narrow-leaved mahoe, broadleaf, lemonwood, pohuehue and native jasmine. Trunk diameters (cm at breast height) of the larger trees are: kahikatea, 40 to 50; totara, 30 to 40; matai, 50 to 60; pokaka, 60 to 100.

Important understorey species are rohutu, shrubby mahoe and horopito. Other understorey species present are wheki-ponga, pate, *Coprosma rotundifolia*, *Coprosma rhamnoides*, *Raukahu anomalus*, turepo, kaikomako, poataniwha, weeping mapou, white climbing rata and saplings of kahikatea, matai and totara.

Groundcover species present are prickly shield fern, hen and chickens fern, mountain kiokio, *Blechnum fluviatile*, *Blechnum chambersii*, *Blechnum procerum*, *Blechnum penna-marina*, hound's tongue fern, thousand-leaved fern, *Hypolepis ambigua*, male fern*, *Clematis marata*, clematis, black nightshade*, nettle, bidibid, hookgrass, pennywort and seedlings of kahikatea, totara, weeping mapou, broadleaf, lemonwood, mahoe, narrow-leaved mahoe, *Coprosma rotundifolia*, wheki-ponga and native jasmine.

Additional species present on the forest margin are *Coprosma tayloriae*, bracken, gorse*, blackberry* and Chilean flame creeper*.

Birds/Fauna Observed:

Native birds observed during this brief survey were bellbird, grey warbler, kereru, rifleman, tomtit and fantail.

Notable Flora, Fauna and Habitats:

Important features of this area are the presence of podocarp trees and saplings (kahikatea, matai and totara) including dense stands of young trees on the stream terrace, the habitat the area provides for an at risk bird species (rifleman), the potential of the area to provide habitat for bats, the presence of uncommon plant species (wheki-ponga, shrubby mahoe, rohutū, *Raukawa anomalus* and *Lastreopsis glabella*), the location of the area close to a large and important forest remnant in Stony Stream (SNA 31) and the contribution the area makes to fauna habitat in the wider area.

Notable Plant and Animal Pests:

No invasive plant pests were observed, although the native climber pohuehue (*Muehlenbeckia australis*) may be invasive at the forest margin. Darwin's barberry is present nearby. Animal pests were not surveyed.

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

This area of forest is fenced along its lower boundary. The forest is buffered to some extent by its location on a southeast-facing slope at the corner of the property. It adjoins forest on the adjacent property (SNA 607d) and lies close to a larger, and important, area of forest in Stony Stream (SNA 31).

Condition and Management Issues:

The forest canopy is in good condition. The forest understorey on the hill slope is relatively open. The understorey is denser in most parts of the terrace forest. Continued exclusion of stock, wild animal (possum and pig) control and monitoring for invasive plant pests are probably the most important management actions.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

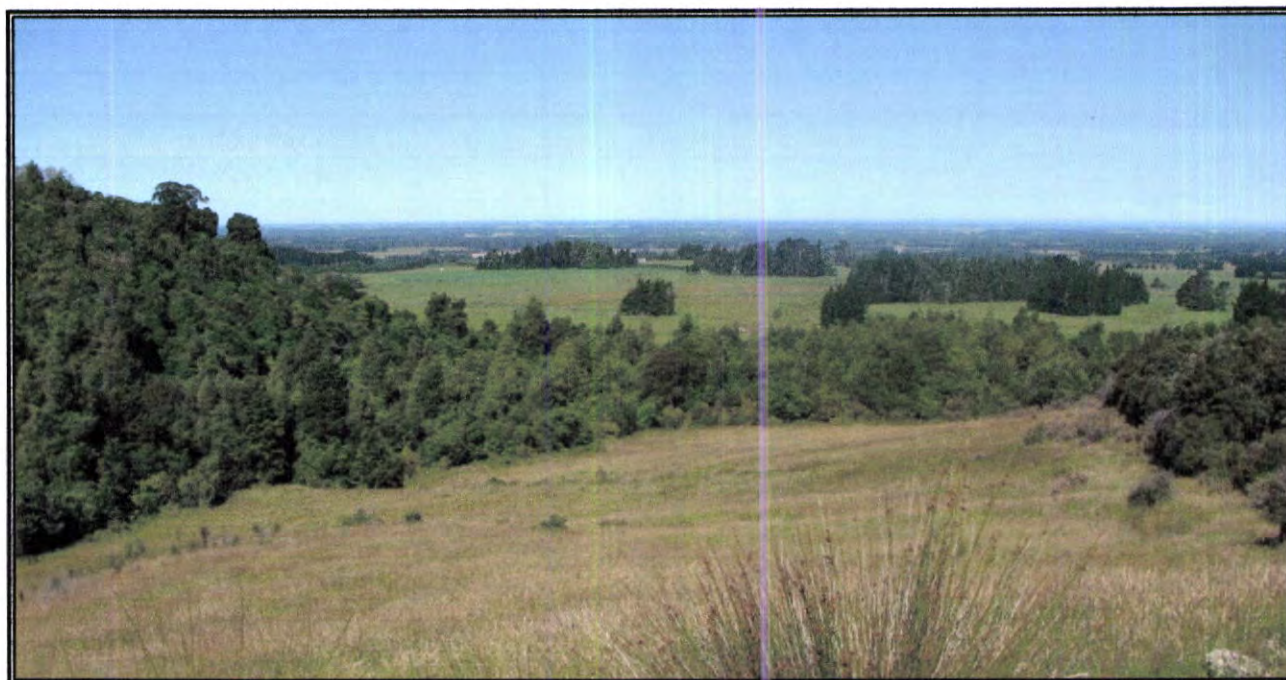
Primary Criteria	Rank	Notes
Representativeness	M/H	A good example of indigenous vegetation typical of the ecological district and containing canopy species representative of the original forest, including podocarps (kahikatea, matai and totara).
Rarity	M/H	Provides good habitat for an at risk (declining) bird species: rifleman. Supports five locally uncommon plant species.
Diversity and pattern	M/H	A relatively diverse forest, though plant diversity is probably reduced from that originally present.
Distinctiveness/special features	M/H	The presence of dense stands of podocarps (notably kahikatea) is a special feature.
Other Criteria		
Size/shape	M/H	A moderate-sized remnant, with a good shape and relatively well buffered.
Connectivity	M/H	Adjoins other forest, lies close to other important indigenous forest remnants and is part of an important network of fauna habitat.
Long-term Sustainability	M/H	Monitoring and control of plant and animal pests will probably be required to maintain the ecological values in the long term.

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

This area of forest has been informally protected by the landowners. The location of the forest on moderately-steep slopes at the corner of the property limits its potential for farm development.

Discussion:

This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the presence of podocarp trees and saplings (kahikatea, matai and totara) including dense stands of young trees on the stream terrace, the habitat the area provides for an at risk bird species (rifleman), the potential of the area to provide habitat for long-tailed bat, the presence of six locally uncommon plant species, the location of the area close to a large and important forest remnant in Stony Stream (SNA 31) and the contribution the area makes to fauna habitat in the wider area.



SNA 627

TIMARU DISTRICT SNA SURVEY

AREA 628a

Area Name: Bottom Tank Forest (Paddock 25)
Location (central map reference): J37: 647-912
Ecological District: Orari
Surveyors: Mike Harding

Property: Orari Gorge Station
Nearest Locality: Woodbury
Area Size (ha): 1.15 **Altitude (m):** 300-350
Survey Time: 1 hour **Survey Date:** 29-01-09

General Description:

This SNA lies in a small gully on moderately-steep east-facing slopes at the base of the foothills near the station homestead. It is near other forest remnants in adjoining gullies and close to the large and very important area of forest in Station Stream (SNA 78a).

Plant Communities:

The main plant community present is podocarp-hardwood forest. This plant community is described in detail below. Naturalized (exotic) species are indicated with an asterisk*.

The forest canopy is dominated by mahoe, lemonwood, broadleaf and pohuehue. Other canopy species present are narrow-leaved lacebark, mapou, five-finger, lancewood, cabbage tree, fuchsia, marbleleaf, bush lawyer, kanuka (at the forest margin) and emergent young kahikatea and totara. Trunk diameters (at breast height) of the larger kanuka trees are between 30 and 40 cm. One totara tree near the upper forest margin has a trunk diameter of 120 cm.

Understorey species present are *Coprosma rotundifolia*, turepo, *Clematis foetida* and saplings of totara.

Groundcover species present are hen and chickens fern, prickly shield fern, *Pellaea rotundifolia*, *Polystichum richardii*, *Blechnum fluviatile*, *Blechnum chambersii*, bidibid, *Asplenium hookerianum*, hairy pennywort and seedlings of pohuehue and Darwin's barberry*.

Species present in forest openings are elderberry*, foxglove*, burdock*, poroporo, Himalayan honeysuckle*, Chilean flame creeper* and pennywort. Additional species present on the forest margin are matipo, *Coprosma propinqua*, *Coprosma tayloriae*, *Coprosma rhamnoides*, mistletoe (on *Coprosma propinqua*), hawthorn* and Darwin's barberry*.

Birds/Fauna Observed:

Native birds observed during this brief survey were bellbird and kereru.

Notable Flora, Fauna and Habitats:

Important features of this area are the presence of podocarp trees (kahikatea and totara) and saplings (totara), the location of the area close to a large (and regionally important) forest remnant in Station Stream, and the contribution the area makes to fauna habitat in the wider area. Larger trees may provide habitat for long-tailed bat.

Notable Plant and Animal Pests:

Darwin's barberry is the most significant plant pest present. Larger bushes are present on the forest margin and seedlings present within the forest. This species is shade-tolerant and has fleshy fruits that are readily dispersed by birds. Other important plant pests present are hawthorn, elderberry and Chilean flame creeper. Animal pests were not surveyed.

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

This area of forest is not fenced, though lies within a larger fenced paddock. The forest is buffered to some extent by its location in a gully. It lies close to a much larger, and very important, area of forest in Station Stream (SNA 78a).

Condition and Management Issues:

The forest canopy is in relatively good condition. The forest understorey is quite open and well-tracked by larger animals, though still supports a sparse population of understorey species including saplings of totara.

The forest understorey would respond well if grazing animals were excluded, though cessation of grazing would probably need to be accompanied by plant pest control.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M/H	A good example of indigenous vegetation typical of the ecological district and containing canopy species representative of the original forest, including podocarps (kahikatea and totara).
Rarity	M	Probably provides habitat for rifleman and may provide habitat for long-tailed bat.
Diversity and pattern	L/M	Plant diversity is less than that of other nearby remnants and is substantially reduced from that originally present.
Distinctiveness/special features	L/M	The presence of podocarp (totara) saplings is a feature.
Other Criteria		
Size/shape	M	A small remnant, though with a good shape and relatively well buffered.
Connectivity	M	Lies close to other indigenous forest remnants and is part of an important network of fauna habitat.
Long-term Sustainability	M	Some conservation management is probably required to maintain the ecological values in the long term.

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

This area of forest has been informally protected by the landowners. The location of the forest on steeper slopes limits its potential for farm development.

Discussion:

This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the presence of podocarp trees (kahikatea and totara) and saplings (totara), the location of the area close to a large (and regionally important) forest remnant in Station Stream, and the contribution the area makes to fauna habitat in the wider area.



SNA 628a

TIMARU DISTRICT SNA SURVEY

AREA 628b

Area Name: Little Hill Forest (Paddock 69)
Location (central map reference): J37: 644-913
Ecological District: Orari
Surveyors: Mike Harding

Property: Orari Gorge Station
Nearest Locality: Woodbury
Area Size (ha): 7.91 **Altitude (m):** 300-460
Survey Time: 1 hour **Survey Date:** 29-01-09

General Description:

This SNA lies in a small gully on moderately-steep east-facing slopes at the base of the foothills near the station homestead. It is near other forest remnants in adjoining gullies and close to a large and very important area of forest in Station Stream (SNA 78a).

Plant Communities:

The main plant community present is podocarp-hardwood forest. This plant community is described in detail below. Naturalized (exotic) species are indicated with an asterisk*.

The forest canopy is dominated by mahoe and pohuehue. Other canopy species present are kowhai, wineberry, fuchsia, lemonwood, mapou, lancewood, marbleleaf, bush lawyer, *Calystegia tuguriorum* and emergent narrow-leaved lacebark, kahikatea and totara. Trunk diameters (at breast height) of the larger totara and kahikatea trees are between 90 and 120 cm.

Understorey species present are *Coprosma crassifolia*, *Coprosma rhamnoides*, *Coprosma rotundifolia*, poataniwha, turepo, native jasmine, bush lawyer, white climbing rata and saplings of kowhai and kahikatea.

Groundcover species present are necklace fern, hen and chickens fern, *Asplenium richardii*, prickly shield fern, *Polystichum richardii*, *Hypolepis ambigua*, hound's tongue fern, bittersweet*, black nightshade*, foxglove*, male fern*, bidibid, pennywort and seedlings of totara, kahikatea, kowhai, mahoe and Darwin's barberry*.

Species present in damper areas are *Blechnum chambersii*, *Blechnum fluviatile* and pate. Additional species present on the forest margin are kanuka and hawthorn*.

Birds/Fauna Observed:

Native birds observed during this brief survey were bellbird, grey warbler and rifleman.

Notable Flora, Fauna and Habitats:

Important features of this area are the presence of podocarp trees (kahikatea and totara) and saplings (kahikatea), the habitat the area provides for an at risk bird species (rifleman), the relative abundance of kowhai in the forest canopy (an important food source for kereru), the location of the area close to a large (and regionally important) forest remnant in Station Stream, and the contribution the area makes to fauna habitat in the wider area. Larger trees may provide habitat for long-tailed bat.

Notable Plant and Animal Pests:

Darwin's barberry is the most significant plant pest present, though only as seedlings within the forest. This species is shade-tolerant and has fleshy fruits that are readily dispersed by birds. Another important plant pest present is hawthorn, on the forest margin. Animal pests were not surveyed.

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

This area of forest is not fenced, though lies within a larger fenced paddock. The forest is buffered to some extent by its location in two small connected gullies. It lies close to a much larger, and very important, area of forest in Station Stream (SNA 78a).

Condition and Management Issues:

The forest canopy is in relatively good condition. The forest understorey is open and well-tracked by larger animals (cattle), though still supports a reasonable range of understorey species including saplings of kahikatea and kowhai. The forest understorey would respond well if grazing animals were excluded, though cessation of grazing would probably need to be accompanied by plant pest control.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M/H	A good example of indigenous vegetation typical of the ecological district and containing canopy species representative of the original forest, including podocarps (kahikatea and totara).
Rarity	M	Provides good habitat for an at risk (declining) bird species: rifleman. May provide habitat for long-tailed bat.
Diversity and pattern	M	Plant diversity is reduced from that originally present.
Distinctiveness/special features	M	The presence of podocarp (kahikatea) saplings and the relative abundance of kowhai are special features.
Other Criteria		
Size/shape	M/H	A moderate-sized remnant, with a good shape and relatively well buffered.
Connectivity	M	Lies close to other indigenous forest remnants and is part of an important network of fauna habitat.
Long-term Sustainability	M	Some conservation management is probably required to maintain the ecological values in the long term.

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

This area of forest has been informally protected by the landowners. The location of the forest on moderately-steep slopes on gully sides limits its potential for farm development.

Discussion:

This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the presence of podocarp trees (kahikatea and totara) and saplings (kahikatea), the habitat the area provides for an at risk bird species (rifleman), the relative abundance of kowhai in the forest canopy (an important food source for kereru), the location of the area close to a large (and regionally important) forest remnant in Station Stream, and the contribution the area makes to fauna habitat in the wider area.



SNA 628b

TIMARU DISTRICT SNA SURVEY

AREA 628c

Area Name: Bottom Station Hill (Paddock 114)
Location (central map reference): J37: 640-916
Ecological District: Orari
Surveyors: Mike Harding

Property: Orari Gorge Station
Nearest Locality: Woodbury
Area Size (ha): 7.66 **Altitude (m):** 380-540
Survey Time: 2 hours **Survey Date:** 29-01-09

General Description:

This SNA lies on a moderately-steep southeast-facing slope in a small gully on the lower hills near the station homestead. It includes a small area of lower-altitude streamside forest at the bottom (east) end of the area, but does not include the patches of vegetation alongside the lower (eastern) reaches of the stream.

Plant Communities:

The main plant community present is podocarp-hardwood forest. This plant community is described in detail below. Naturalized (exotic) species are indicated with an asterisk*.

The forest canopy is dominated by mahoe, lemonwood, fuchsia and marbleleaf. Other canopy species present are broadleaf, kowhai, mapou, lancewood, wineberry and pohuehue, with pate and emergent narrow-leaved lacebark present along the stream. The forest canopy at the lower eastern end of the area is dominated by kowhai and emergent kahikatea. Other canopy species present here are totara, mahoe, broadleaf, lemonwood, five-finger, lancewood, fuchsia, mapou and bush lawyer.

Understorey species present are *Coprosma rotundifolia*, pohuehue, bush lawyer, *Calystegia tuguriorum* and, in the lower forest, kowhai and bittersweet*.

Groundcover species present are prickly shield fern, *Blechnum chambersii*, *Blechnum fluviatile*, *Blechnum penna-marina*, hen and chickens fern, *Asplenium hookerianum*, hound's tongue fern, nettle and seedlings of marbleleaf, mahoe, wineberry, mapou, broadleaf, lancewood, native jasmine, clematis and Darwin's barberry*. Hairy pennywort is present in the lower forest.

Species present in forest openings are *Coprosma propinqua*, thousand-leaved fern, *Hypolepis ambigua*, pennywort, foxglove*, black nightshade* and toatoa. Species present on the drier slopes in the forest are horopito, narrow-leaved mahoe, hen and chickens fern, necklace fern, *Asplenium richardii*, hound's tongue fern, *Blechnum procerum*, mountain kiokio and *Carex forsteri*.

Additional species present on the forest margin are cabbage tree, kanuka, manuka (rare), *Coprosma tayloriae*, gorse* (rare), Himalayan honeysuckle* and one emergent kahikatea tree at the northern margin of the forest. This kahikatea tree has a trunk diameter (at breast height) of 58 cm. Other species present at the margin of the lower forest are Darwin's barberry* and hawthorn*.

Birds/Fauna Observed:

Native birds observed during this brief survey were bellbird, grey warbler, silvereye, rifleman and kereru.

Notable Flora, Fauna and Habitats:

Important features of this area are the presence of podocarp trees (kahikatea and totara), the habitat the area provides for an at risk bird species (rifleman), the relative abundance of kowhai in the forest canopy of the lower forest, the location of the area close to a large (and regionally important) forest remnant in Station Stream and the contribution the area makes to fauna habitat in the wider area. Larger trees may provide habitat for long-tailed bat.

Notable Plant and Animal Pests:

Darwin's barberry and hawthorn are the most significant plant pests present. Darwin's barberry is shade-tolerant. Both species have fleshy fruits that are readily dispersed by birds. Animal pests were not surveyed.

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

This area of forest is not fenced, though lies within a larger fenced paddock. The forest is buffered to some extent by its location on steeper slopes in a small gully. It lies close to a much larger, and very important, area of forest in Station Stream (SNA 78a).

Condition and Management Issues:

The forest canopy is in relatively good condition. The forest understorey is quite open, especially on drier slopes. The forest understorey would respond well if grazing animals were excluded, though cessation of grazing would probably need to be accompanied by plant pest control.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M/H	A good example of indigenous vegetation typical of the ecological district and containing canopy species representative of the original forest, including podocarps (kahikatea and totara).
Rarity	M	Provides good habitat for an at risk (declining) bird species: rifleman. May provide habitat for long-tailed bat.
Diversity and pattern	M	Plant diversity is reduced from that originally present.
Distinctiveness/special features	L/M	The relative abundance of kowhai is a special feature.
<hr/> Other Criteria <hr/>		
Size/shape	M/H	A moderate-sized remnant, with a good shape and relatively well buffered.
Connectivity	M	Lies close to other indigenous forest remnants and is part of an important network of fauna habitat.
Long-term Sustainability	M	Some conservation management is probably required to maintain the ecological values in the long term.

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

This area of forest has been informally protected by the landowners. The location of the forest on moderately-steep slopes on gully sides limits its potential for farm development.

Discussion:

This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the presence of podocarp trees (kahikatea and totara), the habitat the area provides for an at risk bird species (rifleman), the relative abundance of kowhai in the forest canopy of the lower forest, the location of the area close to a large (and regionally important) forest remnant in Station Stream, and the contribution the area makes to fauna habitat in the wider area.

TIMARU DISTRICT SNA SURVEY

AREA 629

Area Name: Slip Panel Stream	Property: Orari Gorge Station	
Ecological District: Orari	Nearest Locality: Woodbury	
AREA 629a: Location (central map ref.): J37: 651-932	Area Size (ha): 10.51	Altitude (m): 260-340
AREA 629b: Location (central map ref.): J37: 645-930	Area Size (ha): 5.27	Altitude (m): 300-350
AREA 629c: Location (central map ref.): J37: 638-927	Area Size (ha): 12.96	Altitude (m): 340-520
AREA 629d: Location (central map ref.): J37: 630-922	Area Size (ha): 4.06	Altitude (m): 520-660
Surveyor: Mike Harding	Survey Time: 3 hours	Survey Date: 17-02-09

General Description:

This SNA is a long narrow corridor of indigenous forest and scrub on the south-facing scarp of lower Slip Panel Stream and in the incised headwaters of upper Slip Panel Stream, north of the homestead. It is divided into four parts by three farm roads.

Plant Communities:

The main plant community present is podocarp-hardwood forest. This plant community is described for the four separate parts of the SNA below. Naturalized (exotic) species are indicated with an asterisk*.

SNA 629a, Lower Slip Panel Stream Scarp:

The forest canopy here is dominated by broadleaf, kowhai, kanuka, narrow-leaved lacebark, lancewood, fuchsia and pohuehue. Other canopy species present are matai, totara, cabbage tree, five-finger, mahoe, narrow-leaved mahoe, marbleleaf, mapou, matipo, bush lawyer and sycamore*. Trunk diameters (at breast height) of the larger kanuka trees range between 30 and 40 cm.

Understorey species present are *Coprosma rhamnoides*, *Coprosma rotundifolia*, *Coprosma propinqua*, *Coprosma rigida*, yellowwood, kowhai, broadleaf, mahoe, mapou, matipo, narrow-leaved lacebark, pate, native jasmine, hanging spleenwort, clematis and sycamore*.

Groundcover species present are mountain kiokio, prickly shield fern, hound's tongue fern, *Blechnum penna-marina*, *Blechnum minus*, bush lily, *Carex forsteri*, bidibid, hairy pennywort and seedlings of kowhai, mahoe, narrow-leaved mahoe, lancewood and *Coprosma* species.

Species commonly present along the stream are wineberry, pate, narrow-leaved mahoe, elderberry*, grey willow*, *Blechnum chambersii*, *Blechnum fluviatile* and male fern*.

Species commonly present on the forest margin or in forest openings are horopito, *Coprosma rhamnoides*, *Coprosma propinqua*, *Coprosma rigida*, *Coprosma rotundifolia*, mountain akeake, manuka, koromiko, lawyer, scrub pohuehue, pohuehue, native jasmine, *Calystegia tuguriorum*, *Clematis foetida*, tutu, Himalayan honeysuckle*, broom*, hard fern, bracken, *Hypolepis ambigua*, thousand-leaved fern, foxglove*, black nightshade*, burdock* and blackberry*.

SNA 629b, Mid Slip Panel Stream Scarp:

This part of the SNA was not traversed; it was only viewed from the outside. It appears to support vegetation similar to that in the lower part of the valley (629a). It includes stands of emergent kahikatea and lowland ribbonwood on the valley floor.

SNA 629c, Mid Slip Panel Stream Valley:

The forest canopy here is dominated by kowhai, fuchsia, broadleaf, marbleleaf, lemonwood, lancewood and pohuehue, with occasional emergent kahikatea, totara, matai and lowland ribbonwood. Other canopy species present are narrow-leaved lacebark, mapou, mahoe, cabbage tree, lemonwood, five-finger, bush lawyer and native jasmine. Trunk diameters (at breast height) of the larger kowhai trees on the valley floor are between 45 and 60 cm.

Other species observed (mostly from the forest margin) were pate, Himalayan honeysuckle*, manuka, *Coprosma tayloriae*, *Coprosma rotundifolia*, koromiko, bracken, *Blechnum fluviatile*, mountain kiokio, hard fern, hen and chickens fern, pennywort, bush lily, foxglove* and elderberry*. Stands of plantation forest are present at the forest margins.

SNA 629d, Upper Slip Panel Stream Valley:

The forest canopy here is dominated by kowhai, broadleaf, lemonwood, fuchsia, lancewood, narrow-leaved mahoe, mountain ribbonwood, marbleleaf, wineberry, cabbage tree, bush lawyer, pohuehue and *Calystegia tuguriorum*.

Other species observed (mostly from the forest margin) are horopito, mountain akeake, *Coprosma propinqua*, bush lily, toetoe, flax, bracken, prickly shield fern and thousand-leaved fern.

Birds/Fauna Observed:

Native birds observed during this brief survey were bellbird, kereru, silvereye, fantail, rifleman and harrier.

Notable Flora, Fauna and Habitats:

Important features of this area are the presence of podocarps (kahikatea, matai and totara) including large old trees, the habitat the area provides for an at risk bird species (rifleman), the extent and altitudinal range of the area, and the contribution the area makes to forest bird habitat in the wider area.

Notable Plant and Animal Pests:

Sycamore is the most important plant pest present, though this appears to be confined to the lower valley. The upper part of the SNA appears to be largely free of invasive weeds. Animal pests were not surveyed.

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

The lower part of this area of forest is buffered by its location on south-facing slopes and the upper part buffered by its location in a steep-sided gully and by stands of plantation forest. Lower parts of the area are fenced from grazing. The area lies close to other remnants of indigenous forest in nearby valleys, notably SNA 631.

Condition and Management Issues:

Only parts of this area were traversed. It generally appears to be in good condition. An important management issue is the control or removal of sycamore from the lower valley.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M/H	A good example of indigenous forest typical of the ecological district and containing a good range of species representative of the original forest, notably podocarps (kahikatea, matai and totara).
Rarity	M	Provides habitat for an at risk bird species (rifleman).
Diversity and pattern	M	The SNA covers a wide altitudinal range and supports forest on a range of aspects.
Distinctiveness/special features	M	The presence of large old podocarps is a special feature.
Other Criteria		
Size/shape	H	A large area for the ecological district, well buffered, but with a long narrow shape.
Connectivity	M	Is not directly linked to other areas of indigenous forest, but makes an important contribution to the network of forest habitat in the area.
Long-term Sustainability	M	Some plant and animal pest control will probably 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):

These areas have been informally protected, fenced and excluded from grazing by the landowners. They cover terrain that offers very limited potential for further development due to the steepness of the slopes.

Discussion:

These areas meet the District Plan criteria for Significant Natural Areas. Important features of the areas are the presence of podocarps (kahikatea, matai and totara) including large old trees, the habitat the area provides for an at risk bird species (rifleman), the extent and altitudinal range of the area, and the contribution the area makes to forest bird habitat in the wider area.



Looking up to SNA 629c (middle) and SNA 629d (distance)

TIMARU DISTRICT SNA SURVEY

AREA 631a and 631f

Area Name: Southern Smiths Gully

Ecological District: Orari

AREA 631a: Location (central map ref.): J37: 642-934

AREA 631f: Location (central map ref.): J37: 647-934

Surveyor: Mike Harding

Property: Orari Gorge Station

Nearest Locality: Woodbury

Area Size (ha): 2.15

Altitude (m): 340-380

Area Size (ha): 4.89

Altitude (m): 300-380

Survey Time: 1 hour

Survey Date: 17-02-09

General Description:

These SNAs lie in small incised tributary gullies of Smiths Gully. Vegetation in both gullies was not surveyed in detail; instead it was inspected from the forest exterior.

Plant Communities:

The main plant community present in these gullies is podocarp-hardwood forest. This plant community is described briefly for each area below. Naturalized (exotic) species are indicated with an asterisk*.

SNA 631a:

Forest canopy species in this small gully are lancewood, marbleleaf, broadleaf, five-finger, kanuka, mapou, matipo, kahikatea, totara, narrow-leaved lacebark, fuchsia, narrow-leaved mahoe, cabbage tree, bush lawyer and pohuehue.

Other species present are manuka, mountain akeake, *Coprosma propinqua*, yellowwood and necklace fern.

SNA 631f:

The forest canopy here is dominated by kanuka and fuchsia. Other canopy species present are five-finger, lancewood, narrow-leaved mahoe, wineberry, matipo, broadleaf, narrow-leaved lacebark, kahikatea, mapou, cabbage tree, marbleleaf, bush lawyer, native jasmine and pohuehue.

Species present on the forest margin or in forest openings are kanuka, manuka, *Coprosma propinqua*, Himalayan honeysuckle*, elderberry*, prickly shield fern, black nightshade*, bittersweet*, hard fern, pennywort, foxglove* and burdock*.

Birds/Fauna Observed:

Native birds observed during this brief survey were kereru, bellbird, fantail, grey warbler, silvereye and rifleman.

Notable Flora, Fauna and Habitats:

Important features of these areas are the presence of podocarp trees, the habitat the areas provide for forest birds, including an at risk species (rifleman), and the location of the areas adjacent to other areas of indigenous forest.

Notable Plant and Animal Pests:

The main plant pests present are Himalayan honeysuckle and elderberry. These do not pose a significant threat to the forest. Animal pests were not surveyed.

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

These areas are buffered and protected by their locations on steeper slopes in small incised gullies. Both adjoin other areas of indigenous forest at their lower ends.

Condition and Management Issues:

The forest canopy in these areas is a relatively good condition. The forest understorey was not surveyed.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M/H	Good examples of indigenous forest typical of the ecological district and containing podocarps (kahikatea and totara).
Rarity	M	Provides good habitat for an at risk bird species (rifleman).
Diversity and pattern	M	These areas of forest appear reasonably diverse, though species diversity is probably reduced from that originally present.
Distinctiveness/special features	M	The presence of podocarps is a feature.
Other Criteria		
Size/shape	M	These areas are both small to moderate sized but well buffered by their locations.
Connectivity	M	Both areas adjoin other areas of indigenous vegetation and contribute to the network of fauna habitat in the area.
Long-term Sustainability	M/H	Ecological values should persist with some plant and animal pest control.

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

The location of these areas on steeper slopes limits their potential for further development.

Discussion:

These areas meet the District Plan criteria for Significant Natural Areas. Important features of the areas are the presence of podocarp trees and the habitat the areas provide for forest birds, including an at risk species (rifleman).



A view of the central part of SNA 631f

TIMARU DISTRICT SNA SURVEY

AREA 631b

Area Name: Smiths Gully
Location (central map reference): J37: 645-938
Ecological District: Orari
Surveyors: Mike Harding

Property: Orari Gorge Station
Nearest Locality: Woodbury
Area Size (ha): 12.23 **Altitude (m):** 280-400
Survey Time: 3 hours **Survey Date:** 18-02-09

General Description:

This SNA lies in the deeply incised lower reaches of Smiths Gully, north of Slip Panel Stream, and on south-facing slopes in the upper part of the gully. Small forested side gullies (SNA 631a and SNA 631f) and the vegetated slopes at the bottom of the gully (SNA 631c) are described elsewhere.

Plant Communities:

The main plant communities present are podocarp-hardwood forest and beech forest. These plant communities are described in detail below for each part of the area surveyed. Naturalized (exotic) species are indicated with an asterisk*.

Podocarp-hardwood forest on south-facing slopes in the mid-upper gully:

The forest canopy here is dominated by narrow-leaved lacebark, kowhai, lancewood, fuchsia and pohuehue. Other canopy species present are marbleleaf, narrow-leaved mahoe, matipo, wineberry, broadleaf, kanuka, cabbage tree and scattered emergent kahikatea trees. One large totara tree is present in the mid-valley.

The forest understorey was not surveyed at this location.

Species present in the valley bottom nearer the stream are five-finger, weeping mapou, manuka, mountain akeake, *Coprosma propinqua*, *Coprosma rotundifolia*, pate, Himalayan honeysuckle*, elderberry*, bush lawyer, prickly shield fern, hound's tongue fern, *Blechnum fluviatile*, *Blechnum chambersii*, mountain kiokio and hen and chickens fern.

Plantations of Douglas fir adjoin this forest in the upper and mid valley.

Podocarp-hardwood forest in the lower gully:

This forest is located in bottom of a steeply incised gully. Beech forest (described below) is present above these steep scarps on the valley sides. Species present in forest canopy here are kowhai, kanuka, fuchsia, kahikatea, wineberry, narrow-leaved mahoe, mahoe, marbleleaf, lemonwood, broadleaf and pohuehue.

Important understorey species are mahoe and *Coprosma rhamnoides*. Other understorey species present are *Coprosma rotundifolia*, mapou, lancewood, five-finger, pate, matipo, yellowwood, *Clematis foetida*, *Calystegia tuguriorum*, hanging spleenwort, black nightshade* and, in places, saplings of kahikatea.

Groundcover species present are bush lily, hookgrass, hen and chickens fern, prickly shield fern, hound's tongue fern, necklace fern, *Blechnum fluviatile*, *Blechnum chambersii*, *Blechnum procerum*, *Blechnum penna-marina*, mountain kiokio, *Leptopteris hymenophylloides*, *Grammitis* sp., hairy pennywort and seedlings of kowhai, wineberry, mahoe, narrow-leaved lacebark, marbleleaf, cabbage tree, native jasmine and occasionally kahikatea.

Additional species present on the stream margin or on steeper banks are Himalayan honeysuckle* and mountain akeake.

Beech forest in lower gully:

Beech forest is present in narrow patches between the fenced paddocks and the steep scarp of the lower valley. The forest canopy is dominated by mountain beech (probably an intermediate form between black beech and mountain beech). Other canopy or sub-canopy species present are narrow-leaved lacebark and lancewood. Trunk diameters (at breast height) of the beech trees range from 11 to 106 cm.

Other canopy or sub-canopy species present in the beech forest adjacent to the terrace are five-finger, fuchsia, marbleleaf, mapou, narrow-leaved lacebark, narrow-leaved mahoe, mahoe and kanuka.

The dominant understorey species on the scarp crest is *Coprosma rhamnoides*. Other understorey species are mapou, *Coprosma crassifolia*, *Coprosma propinqua*, yellowwood, korokio, lancewood, matipo, pokaka, shrubby mahoe, native jasmine, bush lawyer and saplings of matai and kahikatea. At least three beech saplings (between 2 and 6 m tall) are present. Other understorey species in adjacent beech forest are pate, poataniwha, *Clematis foetida*, *Coprosma rotundifolia*, horopito, soft tree fern and hanging spleenwort.

Groundcover species present are hound's tongue fern, *Blechnum procerum*, bracken, mouse-ear hawkweed* and seedlings of clematis, five-finger, mapou, matipo and lancewood. Species less commonly present are prickly shield fern, hen and chickens fern, crown fern, *Blechnum chambersii*, *Blechnum fluviatile*, bush lily, bush rice grass, hookgrass and pennywort.

Additional species present on the forest margin are kanuka, manuka, gorse*, hard fern and thousand-leaved fern. One small tree of holly* near the scarp edge was cut and the trunk treated with herbicide.

Birds/Fauna Observed:

Native birds observed during this survey were grey warbler, bellbird, silvereye, rifleman, fantail and kereru.

Notable Flora, Fauna and Habitats:

Important features of this area are the diversity of plant communities present, the presence of mature and sapling/seedling podocarps, the presence of beech forest and especially regenerating (sapling) beech trees, the habitat the area provides for forest birds including an at risk species (rifleman), the presence of locally uncommon plant species (crown fern, soft tree fern, shrubby mahoe, bush rice grass, hard fern and mountain/black beech) and the extent of the area.

Notable Plant and Animal Pests:

Holly was the only significant plant pest observed in this area, and this was removed. Douglas fir planted adjacent to forest at the upper parts of the site may pose a threat, as its seedlings are shade-tolerant and can invade indigenous forest. Animal pests were not surveyed.

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

Most parts of this area are very well buffered by the steepness of the scarp in the lower valley and the slopes in the upper valley. Most boundaries in the lower valley are fenced. The area adjoins other indigenous forest (SNA 631c) at its lower end and lies relatively close to other important areas of indigenous forest in Black Birch Stream (SNA 633) and Slip Panel Stream (SNA 629). A vehicle track bisects the site in the mid-valley.

Condition and Management Issues:

Most parts of this area appear in good condition. Plant pest control at the forest margins and monitoring for any Douglas fir or pine spread appear to be the most important management issues.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	H	A very good example of indigenous forest typical of the ecological district and containing canopy species (kahikatea, totara and beech) highly representative of the original vegetation.
Rarity	M/H	Provides habitat for an at risk bird species (rifleman). Beech forest is an uncommon plant community. Supports six locally uncommon plant species. Potential habitat for long-tailed bat.
Diversity and pattern	M/H	A diverse range of plant communities and species are present. Plant diversity in some parts may be similar to that originally present.
Distinctiveness/special features	M/H	The presence of healthy beech regeneration and some large podocarp trees are notable features.
Other Criteria		
Size/shape	M/H	A moderate-sized area that is very well buffered.
Connectivity	M/H	Adjoins other areas of indigenous vegetation and makes an important contribution to the network of fauna habitat in the area.
Long-term Sustainability	M/H	Some plant and animal pest control may be required to maintain the ecological values in the long term.

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

The lower part of this area is very well protected (and largely inaccessible) due to the deeply incised stream and very steep scarps. Upper parts are also well buffered by their location on steeper slopes. The area is mostly fenced and/or buffered by planted trees. The area has very limited potential for further development.

Discussion:

This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the diversity of plant communities present, the presence of mature and sapling/seedling podocarps, the presence of beech forest and especially regenerating (sapling) beech trees, the habitat the area provides for forest birds including an at risk species (rifleman), the presence of six locally uncommon plant species and the extent of the area.



A view down SNA 631b, with the areas of beech forest visible in the lower valley.



The beech forest margin, with a young beech sapling at centre (SNA 631b).

TIMARU DISTRICT SNA SURVEY

AREA 631c

Area Name: Ashbys Bush Face

Location (central map reference): J37: 648-940

Ecological District: Orari

Surveyors: Mike Harding

Property: Orari Gorge Station

Nearest Locality: Woodbury

Area Size (ha): 9.35

Altitude (m): 260-340

Survey Time: 1 hour

Survey Date: 18-02-09

General Description:

This SNA covers the moderately-steep to steep slopes on the face adjacent to lower Smiths Gully. It is bisected by the farm road between Ashbys Bush and the Oat Paddock. It adjoins SNA 631d on the river flat below, SNA 631b in Smiths Gully and SNA 633a in the small gully adjacent to Black Birch Stream.

Plant Communities:

The main plant community present is podocarp-hardwood forest. This plant community is described in detail below. Naturalized (exotic) species are indicated with an asterisk*.

The forest canopy is dominated by kowhai and broadleaf. Other canopy species present are narrow-leaved lacebark, marbleleaf, lancewood, kanuka, yellowwood, mapou, five-finger, lemonwood, wineberry, matipo, fuchsia, bush lawyer, pohuehue, native jasmine, *Calystegia tuguriorum* and emergent kahikatea, matai and totara.

Important understorey species are *Coprosma rotundifolia* and mahoe. Other understorey species present are poataniwha, mapou, broadleaf, bush lawyer and *Calystegia tuguriorum*.

Dominant groundcover species present are hen and chickens fern and prickly shield fern. Other species present are hound's tongue fern, hookgrass, *Carex forsteri* and seedlings of five-finger, lancewood, kowhai and native jasmine.

Species present on the forest margin are mountain akeake, manuka, narrow-leaved mahoe, bush snowberry, koromiko, *Coprosma rotundifolia*, *Coprosma propinqua*, *Coprosma rhamnoides*, *Coprosma tayloriae*, yellowwood, matagouri, lawyer, bittersweet*, tutu, thousand-leaved fern, bracken and male fern*. Young sycamore* is present on the lower boundary of the area. Other species present in forest openings are Himalayan honeysuckle* and elderberry*.

Birds/Fauna Observed:

Native birds observed during this brief survey were grey warbler, bellbird, kereru, fantail, rifleman and harrier.

Notable Flora, Fauna and Habitats:

Important features of this area are the presence of podocarp trees (kahikatea, matai and totara), the habitat the area provides for forest birds including an at risk species (rifleman) and the density and diversity of the vegetation.

Notable Plant and Animal Pests:

The area is largely free of weeds. A small infestation of young sycamore is present in one area near the lower boundary. Animal pests were not surveyed.

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

This SNA is securely fenced along its upper and lower boundaries. It adjoins other areas of indigenous vegetation on other boundaries (SNA 633a and SNA 631b). An open grassed track (and fence) separates it from SNA 631d at the base of the slope. A well-formed farm road bisects the SNA.

Condition and Management Issues:

The forest in this SNA is for the most part in good condition. The main management issue is removal of the small infestation of sycamore.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M/H	A good example of indigenous forest typical of the ecological district and containing representative canopy species including podocarps (kahikatea, matai and totara).
Rarity	M	Provides good habitat for forest birds, including an at risk species (rifleman). Provides potential habitat for long-tailed bat.
Diversity and pattern	M	A relatively diverse range of plant species present.
Distinctiveness/special features	M	The presence of mature podocarp trees is a special feature.
Other Criteria		
Size/shape	M/H	A moderate-sized area with a good shape and well buffered/fenced.
Connectivity	M/H	Adjoins and links other areas of indigenous vegetation.
Long-term Sustainability	M/H	Some plant and animal pest control may be required to maintain its ecological values in the long term.

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

This area has been securely fenced and protected by the landowners. The steepness of parts of the site limit its potential for further development, though there are areas on gentler slopes near the road.

Discussion:

This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the presence of podocarp trees (kahikatea, matai and totara), the habitat the area provides for forest birds including an at risk species (rifleman), the density and diversity of the vegetation and the extent to which the area links other areas of indigenous vegetation.



A view south to SNA 631e (centre-left, distance); SNA 631d (centre); SNA 631c (centre-right) and SNAs 633a and 633b (foreground)

TIMARU DISTRICT SNA SURVEY

AREA 631d

Area Name: Top Ashbys Bush

Location (central map reference): J37: 651-941

Ecological District: Orari

Surveyors: Mike Harding

Property: Orari Gorge Station

Nearest Locality: Woodbury

Area Size (ha): 3.97

Altitude (m): 250

Survey Time: 1 hour

Survey Date: 18-02-09

General Description:

This SNA comprises a patch of tall open forest on a recent terrace/alluvial flat of the Orari River, alongside the gravel road.

Plant Communities:

The main plant community present is hardwood forest. This plant community is described in detail below. Naturalized (exotic) species are indicated with an asterisk*.

The forest canopy is dominated by kowhai, narrow-leaved lacebark and pohuehue. Other canopy species present are cabbage tree, fuchsia, marbleleaf, wineberry, broadleaf, *Calystegia tuguriorum*, native jasmine, bush lawyer, lawyer and a single kahikatea at the southeast corner of the area near the road. Trunk diameters (cm at breast height) of the larger trees are: narrow-leaved lacebark, 44 to 60; cabbage tree, 78; marbleleaf, 50; and lancewood, 30.

The dominant understorey species is *Coprosma rotundifolia*. Other understorey species present are kowhai, narrow-leaved lacebark, leather-leaf fern and black nightshade*.

Groundcover species present are prickly shield fern, *Blechnum penna-marina*, *Blechnum fluviatile*, necklace fern, thousand-leaved fern, pennywort, *Schizeilema trifoliolatum*, bidibid, selfheal* and seedlings of elderberry*, kowhai, mahoe, native jasmine, wineberry and matipo.

Species present in forest openings are *Coprosma rotundifolia*, *Hypolepis ambigua*, prickly shield fern, pohuehue, sweet brier*, pasture grasses*, Californian thistle*, nodding thistle*, burdock* and bittersweet*.

Birds/Fauna Observed:

Native birds observed during this brief survey were bellbird, fantail, rifleman and kereru.

Notable Flora, Fauna and Habitats:

Important features of this area are the number and size of the canopy trees, the presence of kahikatea, the habitat the area provides for forest birds including an at risk species (rifleman) and the rarity of this type of forest in the ecological district. The larger trees provide good potential habitat for long-tailed bats.

Notable Plant and Animal Pests:

The most important plant pest present is the native climber pohuehue (*Muehlenbeckia australis*). This aggressive climber is smothering many of the canopy trees and will, if unchecked, eventually lead to canopy collapse. Other naturalized plants do not pose a significant threat to the forest.

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

This area is unfenced, but adjoins relatively extensive areas of forest on the adjacent hill slope and gullies (notably SNA 631c). It makes an important contribution to fauna habitat in the area.

Condition and Management Issues:

Control of pohuehue is the main management issue. Cattle grazing is affecting the forest understorey and groundcover.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M	A good example of alluvial forest typical of the ecological district, though lacking the podocarps that would have almost certainly been originally dominant.
Rarity	M/H	A rare occurrence of tall indigenous forest on a recent alluvial site. Provides good habitat for an at risk bird species (rifleman) and possibly habitat for long-tailed bat (a 'nationally endangered' species).
Diversity and pattern	L/M	A relatively uniform forest community that is substantially less diverse than the forest originally present at the site.
Distinctiveness/special features	M	The size of the hardwood trees is a special feature.
Other Criteria		
Size/shape	M	A moderate to small site, with a good shape.
Connectivity	M/H	Adjoins indigenous forest (SNA 631c) on its eastern (upslope) boundary and makes an important contribution to the network of fauna habitat in the area.
Long-term Sustainability	L/M	Control of pohuehue and perhaps other plant and animal pests will be required to maintain the ecological values of the site in the long term.

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

The forest at this site has presumably been logged in the past, resulting in the loss of podocarps (especially kahikatea). The site has potential for development but has been informally protected by the landowners.

Discussion:

This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the number and size of the canopy trees, the presence of kahikatea, the habitat the area provides for an at risk bird species (rifleman) and possibly bats and the rarity of this type of forest in the ecological district.



SNA 631d viewed from the farm track through SNA 631c

TIMARU DISTRICT SNA SURVEY

AREA 631e

Area Name: Bottom Ashbys Bush
Location (central map reference): J37: 654-934
Ecological District: Orari
Surveyors: Mike Harding

Property: Orari Gorge Station
Nearest Locality: Woodbury
Area Size (ha): 4.81 **Altitude (m):** 260-300
Survey Time: 1 hour **Survey Date:** 18-02-09

General Description:

This SNA lies on moderately steep slopes of a scarp/terrace edge just north of Slip Panel Stream and alongside the gravel road up the Orari River valley.

Plant Communities:

The main plant community present is scattered to dense patches of kanuka forest. This plant community is described in detail below. Naturalized (exotic) species are indicated with an asterisk*.

The forest canopy is dominated by tall kanuka. Trunk diameters (at breast height) of the larger kanuka trees are between 30 and 40 cm. Other common canopy species present are kowhai, cabbage tree, matipo and pohuehue. Less common canopy species are broadleaf, five-finger, lancewood, narrow-leaved lacebark, marbleleaf, wineberry, native jasmine and bush lawyer.

Understorey species present are *Coprosma rhamnoides*, *Coprosma rotundifolia*, *Coprosma crassifolia*, matipo, kanuka, narrow-leaved lacebark, mahoe, black nightshade* and rare totara saplings.

Groundcover species present are prickly shield fern, *Hypolepis ambigua*, male fern*, hound's tongue fern, hen and chickens fern, necklace fern, *Blechnum fluviatile*, *Pellaea rotundifolia*, toatoa, *Schizeilema trifoliolatum*, pennywort, selfheal*, foxglove* and seedlings of native jasmine and *Coprosma propinqua*.

Species commonly present on the forest margin or in forest openings are *Coprosma rotundifolia*, *Coprosma propinqua*, *Coprosma rigida*, *Coprosma tayloriae*, matagouri, fuchsia, Khasia berry*, Himalayan honeysuckle*, sweet brier*, broom*, gorse*, elderberry*, hawthorn*, lawyer, leafless lawyer, scrub pohuehue, mistletoe (on kanuka and *Coprosma propinqua*), toatoa, bracken, blackberry* and thistles*. Uncommon species present are gooseberry*, tutsan* and burdock*.

Birds/Fauna Observed:

Native birds observed during this brief survey were bellbird, kereru, grey warbler, silvereye and rifleman.

Notable Flora, Fauna and Habitats:

Important features of this area are the habitat it provides for forest birds including an at risk species (rifleman), the presence of a locally uncommon plant species (leafless lawyer) and the contribution the area makes to the network of fauna habitat in the area.

Notable Plant and Animal Pests:

A number of invasive woody weeds are present at this site, including Khasia berry, hawthorn, elderberry, sweet brier, gooseberry, broom and gorse. Of these, Khasia berry and hawthorn pose the greatest threat. Both species have fleshy fruits that are easily dispersed by birds, thereby threatening other areas of indigenous forest nearby. Animal pests were not surveyed.

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

The stands of kanuka within this area are unfenced, except for a fence that traverses the site. The forest is buffered to some extent by the steepness of the slopes. The SNA adjoins indigenous forest (SNA 631c and SNA 631f) at its northern end and lies close to indigenous forest in Slip Panel Stream (SNA 629a) at its southern end, providing a link between these two areas. It adjoins a stand of tall pine trees along part of its western (upslope) boundary and the road on its lower boundary.

Condition and Management Issues:

This relatively narrow strip of kanuka forest is a good example of regenerating indigenous forest. Over time, the dominant kanuka trees will be replaced by indigenous hardwood species (notably kowhai) and eventually

podocarps (especially totara). Important management issues are removal of the more invasive plant pests (Khasia berry and hawthorn) and avoiding intensive grazing.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M	A good example of regenerating indigenous forest typical of the ecological district and containing original canopy species (especially kowhai) and saplings of totara.
Rarity	M	Provides useful habitat for an at risk bird species (rifleman). Supports one locally uncommon plant species (leafless lawyer).
Diversity and pattern	L/M	A relatively uniform plant community with species diversity substantially reduced from that originally present.
Distinctiveness/special features	L/M	The presence of totara saplings is a feature.
Other Criteria		
Size/shape	L/M	A small to moderate sized area with a poor shape and limited buffering.
Connectivity	M/H	Adjoins and links other areas of indigenous vegetation. A useful part of the network of fauna habitat in the area.
Long-term Sustainability	M	Plant pest control will probably be necessary to maintain the ecological values of this area in the long term.

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

This SNA is an area of young regenerating indigenous vegetation. Its values will continue to increase with sympathetic management. It occupies a moderately-steep slope that has limited protection for development.

Discussion:

This area just meets the District Plan criteria for a Significant Natural Area. Important features of the area are the habitat it provides for forest birds including an at risk species (rifleman), the presence of a locally uncommon plant species (leafless lawyer) and the contribution the area makes to the network of fauna habitat in the area.



Looking south to SNA 631e

TIMARU DISTRICT SNA SURVEY

AREA 633a

Area Name: Oat Paddock Gully

Location (central map reference): J37: 648-944

Ecological District: Orari

Surveyors: Mike Harding

Property: Orari Gorge Station

Nearest Locality: Woodbury

Area Size (ha): 13.17

Altitude (m): 260-360

Survey Time: 3 hours

Survey Date: 18-02-09
and 05-03-09

General Description:

This SNA covers a small but deeply incised gully just south of lower Black Birch Stream between the Oat Paddock and the Top and Bottom Orari paddocks. It includes forest on the steep south-facing slopes of the upper gully and forest on the steep sharp spurs that define the mouth of the gully. A farm track crosses the upper part of the gully.

Plant Communities:

The main plant communities present are regenerating podocarp-hardwood forest on south-facing slopes of the upper gully, scrub and scattered hardwood forest on the north-facing slopes of the mid-part of the gully, and beech forest on the sharp spurs above the gully mouth. These plant communities are described in detail below. Naturalized (exotic) species are indicated with an asterisk*.

Regenerating podocarp-hardwood forest on south-facing slopes of the upper gully:

The forest canopy here is dominated by broadleaf, lancewood and pohuehue. Other canopy species present are fuchsia, wineberry, marbleleaf, matipo, five-finger, mapou, mahoe, narrow-leaved mahoe, kowhai, lemonwood, marbleleaf, yellowwood, pate, bush lawyer and native jasmine. There is a single emergent young kahikatea tree near the road in the upper part of the area and two emergent large matai in the lower gully.

The forest understorey here was not surveyed. Species visible from the forest exterior are yellowwood, weeping mapou, *Coprosma rhamnoides*, bush lily, hound's tongue fern and hen and chickens fern. Species present in forest openings and along the stream are Himalayan honeysuckle*, tutu, mountain akeake, koromiko and grey willow*.

Additional species present on the upper forest margin are kanuka, manuka, cabbage tree, mingimingi, korokio, native broom, flax, a single mountain beech tree (trunk diameter 26 cm) and a single *Laburnum** bush.

Scrub and scattered hardwood forest on the north-facing slopes of the mid-part of the gully:

The vegetation here is dominated by cabbage tree, five-finger, matipo and *Coprosma propinqua*. Other species present are Himalayan honeysuckle*, koromiko, narrow-leaved mahoe, manuka, lancewood, mountain akeake, mapou, native broom, pohuehue, scrub pohuehue, tutu, bracken, mistletoe (on *Coprosma propinqua*) and occasional broom* and gorse*.

Kanuka forest on the sharp spurs above the gully mouth:

The forest canopy on the south side of the gully mouth is dominated by kanuka. Other canopy species present are five-finger and marbleleaf.

Important understorey species are *Coprosma rhamnoides* and mingimingi. Other less common understorey species present are lancewood, koromiko, five-finger, mapou, yellowwood, *Helichrysum lanceolatum*, lemonwood, matipo, mountain akeake, kowhai, korokio and leather-leaf fern.

Groundcover species present are hound's tongue fern, mountain kiokio, bracken, bush lily, hookgrass and seedlings of lancewood, mapou and broadleaf.

Beech Forest:

The forest canopy on the steep spur on the southern side of the stream mouth is dominated by mountain beech¹. Trunk diameters (at breast height) of the beech trees range between 21 and 74 cm. One beech sapling, approximately 3.5 m tall, was observed. Other canopy species are lancewood and broadleaf.

Understorey species in the beech forest are *Helichrysum lanceolatum*, *Coprosma rhamnoides*, *Coprosma crassifolia*, yellowwood, broadleaf, bush snowberry, mapou, five-finger and lancewood. Groundcover species are hound's tongue fern, hanging spleenwort and a single plant of turutu (*Dianella nigra*).

A smaller patch of beech forest on the northern side of the gully, at the top of the spur leading down into lower Black Birch Stream has beech trees with trunk diameters between 27 and 65 cm. The forest understorey is similar to that described above. Additional species here are mingimingi, poataniwha, *Clematis marata*, *Clematis foetida*, seedlings of kowhai, mahoe and totara. A small group of pine* trees is present at the scarp crest.

Birds/Fauna Observed:

Native birds observed during this survey were bellbird, kereru, rifleman, silvereye, grey warbler and fantail.

Notable Flora, Fauna and Habitats:

Important features of this area are the presence of podocarps (including large old matai trees), the presence of two patches of beech forest (including a beech sapling), the habitat the area provides for forest birds including an at risk species (rifleman), the presence of three locally uncommon plant species (mingimingi, turutu and *Helichrysum lanceolatum*) and the contribution the area makes to forest bird habitat in the wider area.

Notable Plant and Animal Pests:

This SNA is largely weed-free except for the presence of Himalayan honeysuckle on forest margins and grey willow along the stream. Isolated plants of broom and gorse are present on steep open north-facing slopes, but these species do not pose a significant threat to the forest. Animal pests were not surveyed.

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

This SNA is very well buffered by its location in a steeply-incised gully and by high scarps at the down-valley end. Some boundaries are fenced and stock incursion appears minimal. The area adjoins other areas of indigenous forest to the north (SNA 633b), south (SNA 631c) and west (SNA 633f).

Condition and Management Issues:

This area of forest is in relatively good condition. The presence of at least one young (sapling) beech tree is notable, as many patches of beech forest in the District lack beech regeneration. Continued animal pest control is probably the most important management action.

¹ The beech appears to be an intermediate form between black beech and mountain beech.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	H	A very good example of beech forest and a modified example of podocarp hardwood forest typical of the ecological district.
Rarity	M/H	Beech forest is an uncommon plant community. The area provides habitat for an at risk bird species (rifleman) and supports three locally uncommon plant species (mingimingi, turutu and <i>Helichrysum lanceolatum</i>).
Diversity and pattern	M/H	A diverse range of plant communities, though species diversity is probably reduced from that originally present.
Distinctiveness/special features	M	The presence of large old matai trees and beech regeneration are special features.
Other Criteria		
Size/shape	M/H	A moderate-sized area that is very well buffered.
Connectivity	M/H	Adjoins and links two other areas of indigenous forest and adjoins an area of wetland vegetation. Makes an important contribution to the fauna habitat of the wider area.
Long-term Sustainability	M/H	Some animal pest control will probably be necessary to maintain the ecological values in the long term.

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

The steep and deeply-incised topography limits the potential of this area for further development.

Discussion:

This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the presence of podocarps (including large old matai trees), the presence of two patches of beech forest (including a beech sapling), the habitat the area provides for forest birds including an at risk species (rifleman), the presence of three locally uncommon plant species and the contribution the area makes to forest bird habitat in the wider area.



Looking east down SNA 633a. An area of beech forest is visible in the distance.

TIMARU DISTRICT SNA SURVEY

AREA 633b

Area Name: Lower Black Birch Stream
Location (central map reference): J37: 645-948
Ecological District: Orari
Surveyors: Mike Harding

Property: Orari Gorge Station
Nearest Locality: Woodbury
Area Size (ha): 44.47 **Altitude (m):** 260-440
Survey Time: 4 hours **Survey Date:** 04-03-09
and 05-03-09

General Description:

This SNA covers the steep slopes on either side of the lower section of Black Birch Stream. The most extensive area of forest in this SNA is regenerating podocarp-hardwood forest on steep slopes on the south-facing side of the valley.

Plant Communities:

The main plant community present is podocarp-hardwood forest. This plant community is described in detail for the different parts of the SNA surveyed. Naturalized (exotic) species are indicated with an asterisk*.

Forest on the valley floor and lower terraces in the lower valley:

The forest beside the gravel road (adjacent to the SNA) is dominated by flood-protection plantings of willow and poplar. Additional species within this planted forest are blackberry*, bittersweet* and seedlings of kowhai, broadleaf, five-finger, *Coprosma* species and sycamore*.

This forest grades up-valley to remnant lowland forest dominated by kowhai, lowland ribbonwood, narrow-leaved lacebark, lemonwood, fuchsia and broadleaf. Other canopy species present are totara (one with a trunk diameter of 106 cm), kanuka, pohuehue and native jasmine.

Understorey species present are *Coprosma rotundifolia*, *Coprosma rigida*, *Coprosma crassifolia*, *Coprosma rhamnoides*, poataniwha, pate, lowland ribbonwood, mahoe, matipo, lemonwood, lancewood, mapou, weeping mapou, wineberry, bush lawyer, *Calystegia tuguriorum* and gooseberry*.

Groundcover species present are prickly shield fern, *Polystichum richardii*, hound's tongue fern, hen and chickens fern, *Pellaea rotundifolia*, *Hypolepis ambigua*, hookgrass, *Carex forsteri*, bush lily, hairy pennywort, black nightshade* and seedlings of lancewood, kowhai and native jasmine.

Additional species present adjacent to the stream are grey willow*, Himalayan honeysuckle* and Chilean flame creeper*.

Forest on steep south-facing slopes:

The forest canopy here is mostly dominated by broadleaf, fuchsia, mahoe and pohuehue. Other canopy species present are lemonwood, kowhai, wineberry, five-finger, matipo and, at mid-slope, several large emergent old totara trees.

Mahoe is the dominant understorey species. Other understorey species present are poataniwha, lemonwood, matipo, mapou, weeping mapou, marbleleaf, *Coprosma crassifolia*, *Coprosma rotundifolia*, pate, poroporo, bush lawyer, leafless lawyer and bittersweet*.

Groundcover species present are hound's tongue fern, prickly shield fern, hen and chickens fern, *Polystichum richardii*, *Pellaea rotundifolia*, *Asplenium richardii*, black nightshade*, *Calystegia tuguriorum*, pohuehue, bush lily and seedlings of wineberry, broadleaf, kowhai and native jasmine.

Additional species present on the forest margin are Himalayan honeysuckle*, mountain akeake, koromiko, *Hebe traversii*, *Coprosma propinqua*, tutu, bracken, mountain kiokio and blackberry*.

Forest on a high terrace in the lower valley:

This is an unusual example of terrace forest. It is located on the south (true-right) side of the lower valley at the lower (eastern) end of the Bottom Orari Paddock.

The forest canopy is dominated by totara, lemonwood and lancewood. Other canopy species present are kahikatea, matai, broadleaf, kowhai, narrow-leaved lacebark, native jasmine, pohuehue and occasional mahoe. Trunk diameters (cm at breast height) of the larger trees are: totara, 40 to 70; kahikatea, 40-60; matai, 50; kowhai, 45-55 and lancewood, 20-30.

The dominant understorey species is *Coprosma rotundifolia*. Other understorey species present are turepo, weeping mapou, kaikomako, poataniwha, horopito, *Coprosma rhamnoides*, leather-leaf fern, bush lawyer and saplings of totara, matai and kahikatea.

The (grazed) forest floor is open. Groundcover species present are prickly shield fern, hen and chickens fern, *Blechnum penna-marina*, *Hypolepis ambigua*, *Hydrocotyle heteromeria*, black nightshade* and seedlings of mahoe, pohuehue, kowhai and kahikatea.

Additional species present on the forest margin are kanuka, marbleleaf, *Coprosma crassifolia*, *Coprosma propinqua*, *Coprosma rigida*, *Coprosma tayloriae*, yellowwood, *Helichrysum lanceolatum*, mapou, korokio, lawyer and Himalayan honeysuckle*.

Forest on gentle north-facing slopes in the lower valley:

This area lies on gentle slopes just above the terrace forest described above. The forest canopy is dominated by lemonwood, lancewood and kanuka. Other canopy species present are broadleaf, mapou, five-finger, yellowwood and mahoe. This forest grades upslope to the kanuka and beech forest described for SNA 633a.

The dominant understorey species is *Coprosma rhamnoides*. Other understorey species present are *Coprosma crassifolia*, *Coprosma rotundifolia*, yellowwood, weeping mapou, *Helichrysum lanceolatum* and bush lawyer.

Groundcover species present are hen and chickens fern, *Asplenium hookerianum*, necklace fern, prickly shield fern, hairy pennywort, *Carex forsteri*, hookgrass, black nightshade* and seedlings of mahoe, mapou and lancewood.

Forest on the valley floor and alongside the main stream:

The forest canopy is variously dominated by kowhai, broadleaf, lemonwood, lancewood and fuchsia. Other canopy species present are narrow-leaved lacebark, lowland ribbonwood, matipo, mapou, five-finger, marbleleaf, wineberry, cabbage tree, kanuka, narrow-leaved mahoe, pohuehue and native jasmine. Scattered emergent trees of totara, kahikatea and matai are present. Trunk diameters (at breast height) of the larger trees are: kahikatea, 45-75; kowhai, 40-45; totara, 40-80 and broadleaf, 62. This forest extends up the small incised tributary gully on the south side of the valley (towards SNA 633e).

Understorey species present are *Coprosma rotundifolia*, *Coprosma crassifolia*, weeping mapou, matipo, poataniwha, lowland ribbonwood, pohuehue, bush lawyer and *Clematis marata*.

Groundcover species present are prickly shield fern, hen and chickens fern, *Blechnum penna-marina*, necklace fern, hanging spleenwort, male fern*, hairy pennywort, *Schizaelema trifoliolatum*, bidibid, hookgrass, black nightshade* and seedlings of kowhai, broadleaf, matipo, mahoe, narrow-leaved mahoe, five-finger, wineberry, narrow-leaved lacebark, native jasmine and elderberry*.

Species present on the forest margin are Himalayan honeysuckle*, *Coprosma propinqua*, *Coprosma rigida*, *Coprosma tayloriae*, weeping mapou, mountain akeake, yellowwood, *Melicytus* aff. *alpinus* ('Blondin'), manuka, lawyer, bracken, elderberry*, *Calystegia tuguriorum*, *Clematis foetida*, *Clematis marata*, leafless lawyer, thousand-leaved fern and rarely broom*.

A small patch of wattle* is present beside the farm track just above the confluence of the small southern side-valley.

Additional species present nearer the stream are *Hebe traversii*, koromiko, *Carex forsteri*, bush lily, *Blechnum fluviatile*, *Blechnum chambersii*, mountain kiokio, thousand-leaved fern, toatoa and grey willow*.

Birds/Fauna Observed:

Native birds observed during this survey were fantail, bellbird, kereru, rifleman, silvereye and grey warbler.

Notable Flora, Fauna and Habitats:

Important features of this area are the presence of large old podocarps and younger podocarps (kahikatea, totara and matai), the habitat the area provides for an at risk bird species (rifleman), the diversity of plant communities and species, the presence of a locally uncommon plant species, *Hebe traversii*, and the contribution it makes to forest habitat in the wider area.

Notable Plant and Animal Pests:

Grey willow and wattle are the most important plant pests present. Other species, such as Himalayan honeysuckle, elderberry, broom and gorse, do not appear to pose a significant threat to the forest. Animal pests were not surveyed.

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

Most parts of this area are well buffered by their locations on steep slopes and in incised gullies. Most of the forest boundaries are fenced. The area adjoins indigenous forest to the south (SNA 633a) and almost connects with indigenous forest further up the main valley (SNA 633c) and up the southern tributary valley (SNA 633e).

Condition and Management Issues:

The forest in this SNA is mostly in good condition. Removal of the small patch of wattle and exclusion of domestic stock from the terrace forest are the most important management issues.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	H	A good example of indigenous forest typical of the ecological district and containing species (notably podocarps) that are representative of the original vegetation.
Rarity	M	Provides good habitat for an at risk bird species (rifleman) and contains a locally uncommon plant species.
Diversity and pattern	H	A very diverse area, with a number of distinct plant communities and high plant species diversity (74 indigenous species).
Distinctiveness/special features	M/H	The podocarp forest on the high terrace is notable. The presence of large old podocarps is also notable.
Other Criteria		
Size/shape	M/H	A moderate to large area, with a good shape and well buffered.
Connectivity	M/H	Adjoins other areas of indigenous vegetation and makes an important contribution to forest bird habitat in the wider area.
Long-term Sustainability	M/H	The ecological values should persist with minimal conservation management.

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

The steep and incised nature of the area limits its potential for further development. The property owners have informally protected most of the area by fences.

Discussion:

This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the presence of large old podocarps and younger podocarps (kahikatea, totara and matai), the habitat the area provides for an at risk bird species, the diversity of plant communities and species, the presence of locally uncommon plant species and the contribution it makes to forest habitat in the wider area.



Looking east down lower Black Birch Stream, SNA 633b.

TIMARU DISTRICT SNA SURVEY

AREA 633c and 633d

Area Name: Upper Black Birch Stream	Property: Orari Gorge Station
Ecological District: Orari	Nearest Locality: Woodbury
AREA 633c: Location (central map ref.): J37: 630-951	Area Size (ha): 20.24 Altitude (m): 340-500
AREA 633d: Location (central map ref.): J37: 616-946	Area Size (ha): 36.30 Altitude (m): 400-600
Surveyor: Mike Harding	Survey Time: 4 hours Survey Date: 04-03-09

General Description:

These two SNAs cover moderately-steep south facing slopes in the mid- and upper-reaches of Black Birch Stream.

Plant Communities:

The main plant community present is podocarp-hardwood forest. This plant community is described in detail for each area below. Naturalized (exotic) species are indicated with an asterisk*.

Mid Black Birch Stream (SNA 633c):

The forest canopy here is dominated by broadleaf, kowhai and fuchsia. Other canopy species present are pohuehue, matipo, lemonwood, mountain ribbonwood, mapou, lancewood, marbleleaf, five-finger, yellowwood, cabbage tree, mountain akeake, mountain totara and a single young kahikatea tree.

Dominant understorey species are *Coprosma rotundifolia* and poataniwha. Other understorey species present are kowhai, *Coprosma rigida*, *Coprosma rhamnoides*, korokio, mahoe, bush lawyer, native jasmine and *Calystegia tuguriorum*.

Common groundcover species present are prickly shield fern and seedlings of *Coprosma* species. Other species present are *Blechnum penna-marina*, necklace fern, hen and chickens fern, hound's tongue fern, *Pellaea rotundifolia*, male fern*, bush lily, bidibid, hairy pennywort, *Oxalis* sp., foxglove*, burdock* and seedlings of kowhai, lancewood, mahoe, narrow-leaved mahoe, lemonwood and pate.

Species present near the stream are koromiko, mountain akeake, *Olearia bullata*, *Blechnum chambersii*, *Blechnum fluviatile*, mountain kiokio, *Hypolepis ambigua*, *Carex forsteri*, pennywort and a single small (3 m tall) wheki-ponga (*Dicksonia fibrosa*).

Species present on the forest margin are mountain akeake, manuka, weeping mapou, *Coprosma crassifolia*, *Coprosma rigida*, *Coprosma propinqua*, matagouri, *Melicytus* aff. *alpinus* ('Blondin'), porcupine shrub, scrub pohuehue, elderberry*, Himalayan honeysuckle* and thousand-leaved fern.

Upper Black Birch Stream (SNA 633d):

The forest canopy here is dominated by broadleaf and kowhai. Other canopy species present are fuchsia, matipo, marbleleaf, five-finger, cabbage tree, lemonwood, mahoe, lancewood, mountain ribbonwood, wineberry, mountain akeake, pohuehue and occasional mountain totara. Mountain ribbonwood is more common, and three-finger is present as a canopy species, at the upper end of this SNA.

Species present at the forest edge or along the stream margin and on rocky banks are kanuka, koromiko, korokio, *Coprosma crassifolia*, *Coprosma propinqua*, *Coprosma rigida*, matagouri, *Helichrysum intermedium*, bush snowberry, *Melicytus* aff. *alpinus* ('Blondin'), porcupine shrub, toatoa, scrambling fuchsia, lawyer, bush lawyer, *Calystegia tuguriorum*, scrub pohuehue, tutu, *Carex* sp., Himalayan honeysuckle*, black nightshade*, elderberry*, bush lily, prickly shield fern, *Polystichum richardii*, hound's tongue fern, bracken, *Hypolepis ambigua*, mountain kiokio, *Asplenium appendiculatum* and occasional trees of grey willow* beside the stream.

Broom* and gorse* plants are present at one location on the edge of the area between the vehicle track and the stream. A single bush of the tree daisy *Olearia odorata* is present on an open river flat adjacent to the area.

Birds/Fauna Observed:

Native birds observed during this survey were bellbird, rifleman, tomtit, fantail, kereru, silvereye, welcome swallow and harrier.

Notable Flora, Fauna and Habitats:

Important features of this area are the presence of podocarps (mountain totara and one young kahikatea tree), the habitat the area provides for birds including an at risk species (rifleman), the presence of locally uncommon plant species (*Olearia odorata* and *wheki-ponga*), the buffering the vegetation provides to upper Black Birch Stream and the contribution the area makes to fauna habitat in the wider area.

Notable Plant and Animal Pests:

Himalayan honeysuckle is the most widespread plant pest present. Broom and gorse are present at one location adjacent to the area. The agricultural weed, burdock, is abundant in the forest understorey at one location in Area 633c. Animal pests were not surveyed.

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

These two SNAs are not fenced. However, grazing pressure over most parts of the areas is light, as they lie within large paddocks. The vegetation is buffered by its location on moderately-steep south-facing slopes. These SNAs do not adjoin other areas of indigenous vegetation but lie reasonably close to areas in lower Black Birch Stream (SNA 633b and SNA 633e).

Condition and Management Issues:

The forest canopy is in relatively good condition and the forest understorey also appears in good condition except at gentler sites along the stream where it is affected by domestic stock. Vegetation on the adjacent north-facing slopes of the valley appears to have been affected by herbicide spray.

Property Owner Comment:

Owner would like to maintain open routes on the main spurs to provide access for stock.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M/H	Good examples of indigenous vegetation typical of higher altitude forest in this part of the ecological district, including the presence of mountain totara (<i>Podocarpus hallii</i>).
Rarity	M	Provides good habitat for an at risk bird species (rifleman). Supports two locally-uncommon plant species, <i>Olearia odorata</i> and <i>wheki-ponga</i> .
Diversity and pattern	M	A relatively diverse range of species is present, though species diversity is probably reduced from that originally present.
Distinctiveness/special features	M	The presence of mountain totara is a notable feature.
Other Criteria		
Size/shape	M/H	Moderate-sized areas that have a good shape and are well buffered.
Connectivity	M	Not connected to other areas but part of a network of fauna habitat in the area.
Long-term Sustainability	M/H	Some plant and animal pest control will probably be necessary to maintain the ecological values of the areas in the long term.

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

These areas have been informally protected by their location on moderately-steep south-facing slopes. They have very limited potential for development.

Discussion:

These areas meet the District Plan criteria for Significant Natural Areas. Important features of the areas are the presence of podocarps (mountain totara and one young kahikatea tree), the habitat they provide for birds including an at risk species (rifleman), the presence of locally uncommon plant species (*Olearia odorata* and wheki-ponga), the buffering the vegetation provides to upper Black Birch Stream and the contribution the areas make to fauna habitat in the wider area.



Upper Black Birch Stream: SNA 633c at centre-right; SNA 633d at centre-distance.

TIMARU DISTRICT SNA SURVEY

AREA 633e

Area Name: Pinckneys (Paddock 65)

Location (central map reference): J37: 636-943

Ecological District: Orari

Surveyors: Mike Harding

Property: Orari Gorge Station

Nearest Locality: Woodbury

Area Size (ha): 11.78 **Altitude (m):** 340-480

Survey Time: 1½ hours **Survey Date:** 05-03-09

General Description:

This SNA lies on moderately steep south-facing slopes of a lower tributary of Black Birch Stream.

Plant Communities:

The main plant community present is regenerating podocarp-hardwood forest. This plant community is described in detail below. Naturalized (exotic) species are indicated with an asterisk*.

The forest canopy is dominated by kowhai, broadleaf, lancewood and other hardwood trees on spurs and steeper slopes, and lower-stature fuchsia and pohuehue on other slopes. Other canopy species present are five-finger, matipo, lemonwood, marbleleaf, cabbage tree, mahoe, narrow-leaved mahoe, yellowwood, mountain akeake and one young kahikatea tree. One small barberry* tree (with a trunk diameter of 15 cm) was observed on the lower central spur. This tree was felled, the cut-stump treated with Vigilant herbicide and several seedlings and saplings pulled.

Important understorey species are *Coprosma rhamnoides* and yellowwood. Other understorey species present are *Coprosma rigida*, weeping mapou, kowhai, matipo, lancewood, *Melicytus* aff. *alpinus* ('Blondin'), poataniwha, scrambling broom (*Carmichaelia kirkii*), bush lawyer and pohuehue.

Groundcover species commonly present are hound's tongue fern, prickly shield fern and the *Asplenium* ferns listed below. Other groundcover species are bush lily, *Libertia ixioides*, hookgrass, *Clematis marata*, wall lettuce*, foxglove* and seedlings of kowhai, mahoe, five-finger and native jasmine. The dry central spur is notable for the dominance of species of *Asplenium* ferns (including *A. flaccidum*, *A. gracillum*, *A. hookerianum*, *A. richardii*, *A. appendiculatum* and *A. flabellifolium*) and a bewildering array of hybrids.

Species present in forest openings are scrambling broom (in patches on the central spur), koromiko, *Coprosma tayloriae*, *Coprosma propinqua*, *Calystegia tuguriorum*, Himalayan honeysuckle*, pohuehue and bidibid.

Additional species present on the river terrace at the lower forest margin are lowland ribbonwood, mountain ribbonwood, *Coprosma rotundifolia*, pennywort, *Blechnum fluviatile*, thousand-leaved fern, burdock*, *Clematis forsteri* and two young totara trees (partly smothered by pohuehue).

Additional species present on the upper forest margin are kanuka, manuka, flax, matagouri, bush snowberry, tauhinu, scrambling fuchsia, lawyer, scrub pohuehue, bracken, tutu, golden speargrass, cotton daisy, silver tussock and narrow-leaved snow-tussock.

Birds/Fauna Observed:

Native birds observed during this survey were bellbird, fantail (including black-morph individuals), grey warbler, kereru and rifleman. A karearea/falcon was observed flying over this area on the previous day.

Notable Flora, Fauna and Habitats:

Important features of this area are the presence of young podocarps (kahikatea and totara), the habitat the area provides for an at risk bird species (rifleman) and maybe karearea/falcon, the presence of a good population of scrambling broom (*Carmichaelia kirkii*) (threat status: nationally endangered), the presence of other locally-uncommon plant species (*Libertia ixioides* and *Clematis forsteri*), the size of the area and the contribution the area makes to forest bird habitat in the wider area.

Notable Plant and Animal Pests:

The forest is free of invasive plant pests except for Himalayan honeysuckle in forest openings and on forest margins and the presence of a single barberry tree (now removed). The native climber, pohuehue, is

dominant in places and is smothering young totara trees on the river terrace. Burdock and thistles are present on forest margins. Animal pests were not surveyed.

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

This SNA is well buffered by its location on steeper south-facing slopes. It is unfenced, though access for stock is difficult in places. The SNA is separated from another area of podocarp hardwood forest downstream (part of SNA 633b) by a farm track. It is an important part of a network of fauna habitat in the area.

Condition and Management Issues:

The forest canopy over most parts of the SNA is in relatively good condition. The canopy is dominated in places by low-growing fuchsia and pohuehue and the forest understorey affected in places by stock. Monitoring of the lower central spur to detect any re-infestation of barberry would be worthwhile. A fuller survey of the *Carmichaelia kirkii* population and protection of this population from stock are desirable.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M/H	A good example of indigenous forest typical of the ecological district and containing species representative of the original vegetation.
Rarity	H	Contains a good population of a nationally-endangered plant species: scrambling broom (<i>Carmichaelia kirkii</i>). Provides good habitat for an at risk bird species (rifleman) and possibly a threatened species (falcon).
Diversity and pattern	M	Moderate species diversity, though species diversity is probably reduced from that originally present.
Distinctiveness/special features	L/M	The presence of young podocarps is a feature.
Other Criteria		
Size/shape	M/H	A moderate-sized area with a good shape and reasonably well buffered.
Connectivity	M	Adjoins SNA 633b at its lower boundary, lies close to other areas of indigenous vegetation and is an important part of a network of fauna habitat.
Long-term Sustainability	M/H	The ecological values of the area are likely to persist with minimal active management.

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

This SNA lies on steeper slopes that have limited potential for further development. The presence of a good population of a nationally-endangered plant species is an important feature. This is the only known population of this species on the property.

Discussion:

This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the presence of young podocarps (kahikatea and totara), the habitat the area provides for an at risk bird species (rifleman) and maybe falcon, the presence of a good population of scrambling broom (*Carmichaelia kirkii*) (threat status: nationally endangered), the presence of two locally-uncommon plant species, the size of the area and the contribution the area makes to forest bird habitat in the wider area.

TIMARU DISTRICT SNA SURVEY

AREA 633f

Area Name: Bottom Spurs Paddock Wetland
Location (central map reference): J37: 640-941
Ecological District: Orari
Surveyors: Mike Harding

Property: Orari Gorge Station
Nearest Locality: Woodbury
Area Size (ha): 0.56 **Altitude (m):** 350-370
Survey Time: 1 hour **Survey Date:** 05-03-09

General Description:

This SNA lies on the shallow valley-floor of a small gully upstream from SNA 633a and beside the main vehicle track into lower Black Birch Stream. It comprises a narrow wetland.

Plant Communities:

The main plant community present is sedgeland, with smaller areas of rushland and shrubland. This plant community is described in detail below. Naturalized (exotic) species are indicated with an asterisk*.

Most parts of the wetland are dominated by dense rautahi (*Carex coriacea*). Other species present in more open parts of this sedgeland community, especially on the margins, are pasture grasses (notably Yorkshire fog*), bog rush (*Schoenus pauciflorus*), *Juncus gregiflorus*, *Juncus pallidus*, pukio (*Carex secta*), Californian thistle*, white clover*, dock*, *Lotus pedunculatus**, *Ranunculus glabrifolius* and *Ranunculus repens**,

The upper end of the wetland supports two large patches of toetoe within a wetter area dominated by *Juncus acutiflorus**, grasses* and bog rush, with rautahi and pukio.

Species present at the wetland margins are *Coprosma propinqua*, manuka, native broom, *Olearia bullata* (two clumps), prickly shield fern and, at the top end, two large (planted) poplar trees. Scattered rautahi extends into pasture on damp ground on the adjacent lower slopes.

Birds/Fauna Observed:

No native birds were observed at the wetland, though bellbird and grey warbler were heard calling from nearby forest and a small group of paradise shelduck was present nearby.

Notable Flora, Fauna and Habitats:

Important features of this area are the presence of wetland habitat which is otherwise uncommon in the area, and the presence of locally uncommon plants: toetoe, native broom and *Carex secta*.

Notable Plant and Animal Pests:

Pasture grasses and Californian thistle are probably the most important plant pests present. However, the main (wettest) part of the wetland, dominated by rautahi and toetoe, should be resilient to the spread of these species. Animal pests were not surveyed.

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

The wetland is unfenced and is part of a larger paddock. It is not well buffered and quite narrow. However, it extends in a more scattered form up-valley above the road culvert at the head of the SNA and adjoins the forested SNA 633a down-valley. It is otherwise surrounded by pasture.

Condition and Management Issues:

The wetland is in reasonable condition. The main management issues are prevention of the establishment of woody weeds, such as willow and gorse, and protection of the plant community from trampling by cattle and intensive grazing. Herbicide use may threaten shrub species at the margins of the wetland, especially native broom and *Olearia bullata*.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M	A modified example of wetland vegetation typical of the ecological district.
Rarity	M/H	A rare community for this part of the ecological district. Supports three locally-uncommon plant species: <i>Carex secta</i> , native broom and toetoe.
Diversity and pattern	M	A relatively diverse range of wetland plants are present, though species diversity is probably reduced from that originally present.
Distinctiveness/special features	L	
Other Criteria		
Size/shape	M	Moderate size for a wetland community, though with a poor shape and not well buffered.
Connectivity	M	Adjoins other (modified) wetland habitat upstream and adjoins the forested SNA 633a downstream.
Long-term Sustainability	M	Some conservation management will probably be required to maintain the ecological values in the long term, notably weed control and stock management.

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

Wetland vegetation has probably persisted in this area due to the continually wet substrate. The narrowness and wetness of the site limits its potential for development.

Discussion:

This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the presence of wetland habitat which is otherwise uncommon in the area, and the presence of locally uncommon plants.



SNA 633f: dense *Carex coriacea* (centre-left); toetoe (right)

TIMARU DISTRICT SNA SURVEY

Wetland Record Form

Wetland 633f

Wetland name: Bottom Spurs Paddock Wetland	Date: 5 th March 2009
Property: Orari Gorge Station	GPS/Grid Ref: J37: 640-941
Altitude: 350 to 370 m	No. of plots sampled:
Location: Small gully south of lower Black Birch Stream	Approximate size (ha):

Classification: I System	IA Subsystem	II Wetland Class	IIA Wetland Form
Palustrine	Permanent	Seepage	Riparian

Surveyors: Mike Harding

Indicator	Indicator components	Specify and Comment	Score 0-5 ¹	Mean score
Change in hydrological integrity	Impact of manmade structures	Road and culvert at top end	4	4.33
	Water table depth	Appears unchanged	5	
	Dryland plant invasion	Only grasses	4	
Change in physico-chemical parameters	Fire damage	No evidence of recent fires	5	4.67
	Degree of sedimentation/erosion	Not evident	5	
	Nutrient levels	Animal dung?	4	
	von Post index			
Change in ecosystem intactness	Loss in area of original wetland	No apparent loss	5	4.5
	Connectivity barriers	Restricted upstream by culvert	4	
Change in browsing, predation and harvesting regimes	Damage by domestic or feral animals	Browsing/trampling over >75% of wetland	1	3
	Introduced predator impacts on wildlife	Presumably moderate	3	
	Harvesting levels	None?	5	
Change in dominance of native plants	Introduced plant canopy cover	<25%	4	3.5
	Introduced plant understorey cover	Pasture grasses in places	3	
Total wetland condition index /25				20

Main vegetation types: *Carex coriacea* sedgeland, scattered *Juncus* spp and *Schoenus pauciflorus*, clumps of *Cortaderia richardii*; riparian shrubs: manuka, native broom, *Olearia bullata* and *Coprosma propinqua*.

Native fauna: bellbird, grey warbler and paradise shelduck nearby.

Other comments: Wetlands are uncommon in this part of Orari Ecological District

Pressure	Rating ²	Specify and Comment
Modifications to catchment hydrology	0	None apparent
Water quality within the catchment	2	Possible mild pollution from domestic stock and wild animals
Animal access	3	No impediment; some pest species control
Key undesirable species	1	Some undesirable wild animal species in catchment
% catchment in introduced vegetation	3	High proportion in introduced vegetation
Other pressures	2	Fertiliser and herbicide drift?
Total wetland pressure index /30	11	

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

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

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

TIMARU DISTRICT SNA SURVEY

AREA 635a

Area Name: West Bank Orari River Gorge
Location (central map reference): J37: 650-958
Ecological District: Orari
Surveyors: Mike Harding

Property: Crown-owned Marginal Strip?
Nearest Locality: Woodbury
Area Size (ha): 5.24 **Altitude (m):** 270-300
Survey Time: 1½ hours **Survey Date:** 10-03-09

General Description:

This SNA covers the steep bank on the west side of the Orari River Gorge, between Black Birch Stream and Andrews Stream. It appears to lie entirely within Crown Land, presumably marginal strip, but is included in this Property Report as it adjoins Orari Gorge Station.

Plant Communities:

The main plant community present is hardwood forest. This plant community is described in detail below. Naturalized (exotic) species are indicated with an asterisk*.

The forest canopy over most parts of this area is dominated by broadleaf, kowhai, five-finger and matipo. Other canopy species present are lancewood, yellowwood, mapou, cabbage tree, mountain ribbonwood, wineberry, koromiko, pohuehue, native jasmine and occasional emergent totara and pine* trees.

Understorey species present are lancewood, mapou, weeping mapou, *Coprosma rhamnoides*, *Coprosma crassifolia*, yellowwood, fuchsia, mahoe, kowhai, five-finger, *Hebe traversii*, korokio, bush lawyer, lawyer, *Calystegia tuguriorum*, clematis, black nightshade*, gooseberry* and spindle tree*.

Groundcover species present are hound's tongue fern, necklace fern, *Asplenium appendiculatum*, hanging spleenwort, hen and chickens fern, prickly shield fern, *Blechnum montanum*, *Blechnum fluviatile*, *Blechnum chambersii*, thousand-leaved fern, *Hypolepis ambigua*, leather-leaf fern, toatoa, flax, bush lily, hookgrass, bidibid, bracken and seedlings of *Coprosma* species, native jasmine, broadleaf, kowhai, cabbage tree, mapou, matipo, lancewood and wineberry.

Species present in forest openings and rocky banks are *Hebe traversii*, *Helichrysum lanceolatum*, mountain akeake, koromiko, leather-leaf fern, Himalayan honeysuckle* and *Helichrysum intermedium*.

Species present on the forest margin at the edge of the terrace and alongside the road are weeping mapou, korokio, *Coprosma propinqua*, *Coprosma rhamnoides*, *Coprosma crassifolia*, *Coprosma tayloriae*, lowland ribbonwood, manuka, mountain akeake, gorse*, broom*, gooseberry*, blackberry*, bittersweet*, Himalayan honeysuckle*, bracken, pohuehue and scrub pohuehue.

Trees of crack willow* and alder* are present in places at the river's edge.

Additional species present at the upstream end of this area are tauhinu, *Olearia bullata*, kanuka, *Coprosma rigida*, matagouri and at least one mountain beech sapling.

Birds/Fauna Observed:

Native birds observed during this brief survey were bellbird, rifleman, fantail and silvereye. Kereru have been observed in this area previously.

Notable Flora, Fauna and Habitats:

Important features of this area are the habitat the vegetation provides for forest birds including an at risk species (rifleman), the extent to which it buffers the Orari River and the density and diversity of the vegetation including the presence of a young beech tree.

Notable Plant and Animal Pests:

Wilding pines are probably the most important plant pest present. Other important woody weeds are spindle tree, gorse, broom and gooseberry, though these species do not pose a significant threat. Animal pests were not surveyed.

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

The vegetation of this area is extremely well buffered by its location on very steep slopes between the terrace (and road) and river. Parts of the upper boundary of the area are fenced. The area adjoins other indigenous vegetation (across the road) on adjacent slopes (SNA 637a and SNA 637b) and similar vegetation on the opposite banks of the river.

Condition and Management Issues:

The vegetation in this SNA is for the most part in very good condition. The main management issue is the removal of wilding pines and continued animal pest control.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M/H	A good representative example of riparian forest on steep river banks in the ecological district.
Rarity	M	Provides habitat for an at risk bird species (rifleman).
Diversity and pattern	M	Species diversity is high, though may be reduced from that originally present.
Distinctiveness/special features	M	The presence of a beech sapling is a notable feature.
Other Criteria		
Size/shape	M	A small to moderate sized area with a very long and narrow shape, but very well buffered.
Connectivity	M/H	Adjoins and lies close to other areas of indigenous vegetation.
Long-term Sustainability	M/H	The ecological values of this area should persist with limited conservation management.

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

This area is very well protected by its location on very steep banks. It has no obvious development potential and is, in effect, protected by its status as Crown-owned land. It lies adjacent to Orari Gorge Station.

Discussion:

This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the habitat the vegetation provides for forest birds including an at risk species (rifleman), the extent to which it buffers the Orari River and the density and diversity of the vegetation including the presence of a young beech tree.

TIMARU DISTRICT SNA SURVEY

AREA 637a

Area Name: Orari River Terrace
Location (central map reference): J37: 650-954
Ecological District: Orari
Surveyors: Mike Harding

Property: Orari Gorge Station
Nearest Locality: Woodbury
Area Size (ha): 7.43 **Altitude (m):** 300-360
Survey Time: 1½ hours **Survey Date:** 10-03-09

General Description:

This SNA lies on a small terrace and the adjacent lower hill slopes, beside the gravel road just north (up-valley) of lower Black Birch Stream.

Plant Communities:

The main plant community present is podocarp-hardwood forest, grading upslope to regenerating hardwood forest and scrub. A small wetland is present in and adjacent to the terrace forest. These plant communities are described in detail below. Naturalized (exotic) species are indicated with an asterisk*.

Podocarp-dominated terrace forest:

The forest canopy here is dominated by broadleaf, marbleleaf and kowhai, with emergent kahikatea and totara. Other canopy species present are narrow-leaved lacebark, lancewood, yellowwood, fuchsia and pohuehue.

Trunk diameters (cm at breast height) of the kahikatea trees range from 12 to 53. One totara tree has a trunk diameter of 50 cm.

The forest understorey is dominated by *Coprosma rotundifolia*. Other understorey species present are korokio, weeping mapou, fuchsia, lancewood, *Coprosma rigida* and bush lawyer.

Groundcover species present are prickly shield fern, *Polystichum richardii*, *Hypolepis ambigua*, necklace fern, *Carex forsteri*, *Ranunculus* sp., pennywort, bidibid, wall lettuce*, moss and seedlings of kahikatea, kowhai, yellowwood and native jasmine.

Additional species adjacent to the small stream are *Blechnum minus*, *Blechnum penna-marina* and *Juncus distegus*.

Additional species present on the forest margin are *Coprosma propinqua*, poataniwha, clematis, scrub pohuehue, elderberry*, bittersweet* and blackberry*.

A small wetland adjacent to the forest is dominated by pasture grasses, rautahi (*Carex coriacea*) and soft rush*. Other species present in or adjacent to the wetland are pukio (*Carex secta*), lotus*, weeping mapou, *Coprosma propinqua*, *Coprosma rigida* and *Blechnum penna-marina*.

Kowhai-dominated terrace and alluvial fan forest:

The forest canopy here is dominated by kowhai, narrow-leaved lacebark and lowland ribbonwood. Other canopy species present are fuchsia, cabbage tree, lancewood, yellowwood, marbleleaf, pohuehue, clematis, native jasmine and occasional kahikatea and totara. Trunk diameters (cm at breast height) of the larger trees are: kowhai, 50-60; narrow-leaved lacebark, 40-50, kahikatea, 57; and totara, 72.

The forest understorey is dominated by *Coprosma rotundifolia*. Other understorey species present are weeping mapou, narrow-leaved lacebark, marbleleaf, *Helichrysum lanceolatum*, bush lawyer, *Calystegia tuguriorum* and gooseberry*.

Groundcover species present are prickly shield fern, hound's tongue fern, hen and chickens fern, *Asplenium richardii*, necklace fern, *Pellaea rotundifolia*, mountain kiokio, *Clematis marata*, bidibid, hookgrass, wall lettuce* and seedlings of kowhai, broadleaf, mahoe, matipo and pate.

Species present in forest openings are *Coprosma propinqua*, *Hypolepis ambigua*, lawyer, male fern*, foxglove* and horehound*. Additional species present on rocky ground are *Coprosma crassifolia*, *Coprosma rhamnoides*, *Melicytus* aff. *alpinus* ('Blondin'), toatoa, black nightshade*, bittersweet*, elderberry* and *Asplenium appendiculatum*.

Species commonly present on the forest margin are weeping mapou, *Coprosma crassifolia*, *Coprosma rotundifolia*, *Coprosma rigida*, horopito, bush lawyer, *Calystegia tuguriorum*, *Melicytus* aff. *alpinus* ('Blondin'), Himalayan honeysuckle* and gooseberry*.

Regenerating hardwood forest and scrub on lower hill slopes:

This low-stature forest is present on the lower hill slopes and in the small gullies above the terrace forest. It is dominated by broadleaf. Other canopy species present are kowhai, matipo, five-finger, lancewood, fuchsia, mountain akeake and occasionally kanuka and narrow-leaved lacebark.

This forest community grades upslope to shrubland and scrub on steep rocky ground dominated by *Coprosma propinqua*, *Coprosma rhamnoides*, *Coprosma crassifolia*, korokio, manuka, *Helichrysum lanceolatum*, weeping mapou, low-growing fuchsia, matagouri, bracken, Himalayan honeysuckle* (including some dense patches), sweet brier*, gorse*, prickly shield fern and scattered emergent young broadleaf and kowhai trees.

Birds/Fauna Observed:

Native birds observed during this brief survey were fantail, bellbird, rifleman, welcome swallow and silvereye. Kereru/NZ pigeon have been observed previously at this site.

Notable Flora, Fauna and Habitats:

Important features of this area are the presence of terrace podocarp-hardwood forest including a small wetland, the abundance of mature kowhai trees, the habitat the area provides for birds including an at risk species (rifleman) and the diversity of plant communities present.

Notable Plant and Animal Pests:

Himalayan honeysuckle is the most prominent plant pest present, though this infestation lies on the upper margin of the area. Other invasive weeds present are elderberry, gooseberry and gorse, though these species do not pose a significant threat. Animal pests were not surveyed.

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

This area is unfenced, though is buffered by its location on or adjacent to moderately-steep hill slopes on one side and a steep bank to the Orari River on the other side. The gravel road traverses the bottom of the site. This SNA adjoins other indigenous vegetation up-valley (SNA 637b) and a narrow strip of indigenous vegetation along the bank of the Orari River (SNA 635a). It also lies close to other areas of indigenous vegetation, notably that in lower Black Birch Stream (SNA 633b).

Condition and Management Issues:

The most important management issue is plant and animal pest control. Encouragement of regeneration in the terrace forest is also important.

Property Owner Comment:

Owner concerned at presence of infestations of gorse and broom on the rocky slopes above the SNA. These areas have been excluded from the SNA to permit weed control on these slopes.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M/H	A good example of terrace and associated indigenous forest that is typical of the ecological district and contains species representative of the original vegetation.
Rarity	M	Provides good habitat for an at risk bird species (rifleman) and a good seasonal food resource (kowhai) for kereru.
Diversity and pattern	M/H	A diverse range of plant communities and relatively high plant species diversity.
Distinctiveness/special features	M	The presence of young podocarps (especially kahikatea) and a small wetland are features.
Other Criteria		
Size/shape	M/H	A moderate-sized area that is relatively well buffered.
Connectivity	M/H	Adjoins other areas of indigenous vegetation and contributes to an important corridor of vegetation along the Orari River.
Long-term Sustainability	M/H	Some plant and animal pest control will probably be required to maintain the ecological values in the long term.

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

Most parts of the area offer very limited potential for further development. The part of the area on the river terrace could be developed, though has been informally protected by the landowners. This forest lies adjacent to the publicly-accessible road up the Orari River and has high scenic value.

Discussion:

This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the presence of terrace podocarp-hardwood forest including a small wetland, the abundance of mature kowhai trees, the habitat the area provides for birds including kereru and an at risk species (rifleman) and the diversity of plant communities present.



The terrace forest of SNA 637a (foreground), including emergent kahikatea and the small wetland.

TIMARU DISTRICT SNA SURVEY

Wetland Record Form

Wetland 637a

Wetland name: Orari River Terrace	Date: 10 th March 2009
Property: Orari Gorge Station	GPS/Grid Ref: J37: 651-953
Altitude: 300 m	No. of plots sampled:
Location: On a terrace beside the gravel road.	Approximate size (ha): < 1

Classification: I System	IA Subsystem	II Wetland Class	IIA Wetland Form
Palustrine	Permanent	Seepage	Riparian

Surveyors: Mike Harding

Indicator	Indicator components	Specify and Comment	Score 0-5 ¹	Mean score
Change in hydrological integrity	Impact of manmade structures	None evident	5	4.67
	Water table depth	No detectable change	5	
	Dryland plant invasion	Grasses in part of wetland	4	
Change in physico-chemical parameters	Fire damage	No evidence of recent fire	5	4.67
	Degree of sedimentation/erosion	None apparent	5	
	Nutrient levels	Animal dung?	4	
	von Post index	n/a		
Change in ecosystem intactness	Loss in area of original wetland	No apparent loss	5	4.5
	Connectivity barriers	Some modification downstream	4	
Change in browsing, predation and harvesting regimes	Damage by domestic or feral animals	Light damage to parts of wetland	4	4
	Introduced predator impacts on wildlife	Presumably moderate	3	
	Harvesting levels	None?	5	
Change in dominance of native plants	Introduced plant canopy cover	Pasture grasses at lower end	4	4.5
	Introduced plant understorey cover	Very little	5	
Total wetland condition index /25				22.3

Main vegetation types: *Carex coriacea* sedgeland and podocarp-hardwood forest

Native fauna: Forest birds present.

Other comments: An uncommon partly-forested river terrace wetland; rare in Orari Ecological District

Pressure	Rating ²	Specify and Comment
Modifications to catchment hydrology	0	None apparent
Water quality within the catchment	1	Largely forested catchment
Animal access	1	Dense woody indigenous vegetation in wetland catchment
Key undesirable species	1	Some wild animals in catchment
% catchment in introduced vegetation	1	Less than 25%
Other pressures	1	Possibly fertiliser and herbicide drift
Total wetland pressure index /30	5	

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

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

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

TIMARU DISTRICT SNA SURVEY

AREA 637b

Area Name: Orari River Face

Location (central map reference): J37: 647-959

Ecological District: Orari

Surveyors: Mike Harding

Property: Orari Gorge Station

Nearest Locality: Woodbury

Area Size (ha): 2.12

Altitude (m): 300-360

Survey Time: 1 hour

Survey Date: 10-03-09

General Description:

This SNA covers the steep rocky slopes above the gravel road up-valley (north) of Black Birch Stream. It adjoins SNA 637a to the south and SNA 635a across the road to the east.

Plant Communities:

The main plant community present is hardwood forest, grading upslope to scrub and rockland. This plant community is described below. Naturalized (exotic) species are indicated with an asterisk*.

The forest canopy is dominated by broadleaf, kowhai and matipo. Other canopy species present are five-finger, cabbage tree, mountain akeake, mapou, pohuehue, *Calystegia tuguriorum* and scattered emergent pine* trees.

Species present at open rocky sites are *Coprosma propinqua*, *Coprosma crassifolia*, korokio, *Helichrysum lanceolatum*, mistletoe (on *Coprosma propinqua*), *Hebe traversii*, matagouri, *Melictyus* aff. *alpinus* ('Blondin'), hound's tongue fern, *Pellaea rotundifolia*, *Asplenium appendiculatum*, tutu, toatoa, male fern*, sweet brier*, broom*, wild marjoram* and blackberry*.

The forest grades upslope to a scrub/shrubland community dominated by *Coprosma propinqua*, *Coprosma crassifolia*, *Helichrysum lanceolatum*, korokio, manuka, matagouri, weeping mapou, fuchsia and bracken.

Birds/Fauna Observed:

Native birds observed during this brief survey were bellbird, silvereye and rifleman. Kereru have been observed here previously. Conditions were unfavourable for lizard surveys, though it appears to provide good lizard habitat.

Notable Flora, Fauna and Habitats:

Important features of this area are the habitat it provides for forest birds and probably lizards, the buffering it provides to the Orari River and the contribution it makes to fauna habitat in the wider area.

Notable Plant and Animal Pests:

Wilding pine trees are probably the most important plant pest present. Other weed species are unlikely to pose a significant threat. Animal pests were not surveyed.

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

This area is unfenced but is well protected by its location on steep rocky slopes. It adjoins other indigenous vegetation down-valley (SNA 637a) and down-slope towards the river (SNA 635a).

Condition and Management Issues:

Scrub on steep slopes above the SNA appears to have been affected by herbicide spray. Removal or containment of wilding pines and wild animal control are probably the most important management issues.

Property Owner Comment:

Wishes to continue weed control on upper slopes; these areas have been excluded from the SNA.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M	A good example of indigenous vegetation typical of these steep slopes.
Rarity	M	Provides good habitat for forest birds and supports an at risk bird species (rifleman). Probably provides good habitat for lizards.
Diversity and pattern	L/M	Species diversity is typical, though probably reduced from that originally present.
Distinctiveness/special features	M	Provides some protection for the Orari River. The area is clearly visible from the road.
Other Criteria		
Size/shape	M	A moderate-sized area that is well buffered by its position on steep slopes.
Connectivity	M	Adjoins indigenous vegetation to the south (SNA 637a) and to the east (SNA 635a).
Long-term Sustainability	M/H	Some pest control may be required to maintain ecological values in the long term.

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

The steep rocky nature of this area makes it generally unsuitable for development. The vegetation provides a scenic backdrop for travellers on the publicly-accessible Orari River road.

Discussion:

This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the habitat it provides for forest birds and probably lizards, the buffering it provides to the Orari River and the contribution it makes to fauna habitat in the wider area.



Looking north (up-valley) along the lower slopes of SNA 637b

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)

alder*	<i>Alnus glutinosa</i>
barberry*	<i>Berberis glaucocarpa</i>
bidibid	<i>Acaena</i> sp.
bittersweet*	<i>Solanum dulcamara</i>
blackberry*	<i>Rubus fruticosus</i>
black nightshade*	<i>Solanum nigrum</i>
bog rush	<i>Schoenus pauciflorus</i>
bracken	<i>Pteridium esculentum</i>
broadleaf	<i>Griselinia littoralis</i>
broom*	<i>Cytisus scoparius</i>
burdock*	<i>Arctium minus</i>
bush lawyer	<i>Rubus cissoides</i>
bush lily	<i>Astelia</i> sp.
bush rice grass	<i>Microlaena</i> sp.
bush snowberry	<i>Gaultheria antipoda</i>
cabbage tree/ti rakau	<i>Cordyline australis</i>
cherry laurel*	<i>Prunus laurocerasus</i>
Chilean flame creeper*	<i>Tropaeolum speciosum</i>
clematis	<i>Clematis paniculata</i>
cotton daisy	<i>Celmisia spectabilis</i> var. <i>magnifica</i>
crack willow*	<i>Salix fragilis</i>
creeping pohuehue	<i>Muehlenbeckia axillaris</i>
crown fern	<i>Blechnum discolor</i>
Darwin's barberry*	<i>Berberis darwinii</i>
Douglas fir/oregon*	<i>Pseudotsuga menziesii</i>
dwarf mistletoe	<i>Korthalsella lindsayi</i>
elderberry*	<i>Sambucus nigra</i>
fescue tussock	<i>Festuca novae-zelandiae</i>
five-finger	<i>Pseudopanax arboreus</i>
flax	<i>Phormium tenax</i>
foxglove*	<i>Digitalis purpurea</i>
fuchsia	<i>Fuchsia excorticata</i>
golden speargrass	<i>Aciphylla aurea</i>
gooseberry*	<i>Ribes uva-crispa</i>
gorse*	<i>Ulex europaeus</i>
grey willow*	<i>Salix cinerea</i>
hairy pennywort	<i>Hydrocotyle moschata</i>
hanging spleenwort	<i>Asplenium flaccidum</i>
hard fern	<i>Paesia scaberula</i>
hawthorn*	<i>Crataegus monogyna</i>
hazelnut*	<i>Corylus</i> sp.
hen and chickens fern	<i>Asplenium bulbiferum</i>
Himalayan honeysuckle*	<i>Leycesteria formosa</i>
holly*	<i>Ilex aquifolium</i>
hookgrass	<i>Uncinia uncinata</i>
horehound*	<i>Marrubium vulgare</i>
horopito/pepperwood	<i>Pseudowintera colorata</i>
hound's tongue fern	<i>Microsorium pustulatum</i>
kahikatea/white pine	<i>Dacrycarpus dacrydioides</i>
kaikomako	<i>Pennantia corymbosa</i>
kanuka	<i>Kunzea ericoides</i>
Khasia berry*	<i>Cotoneaster simonsii</i>
korokio	<i>Corokia cotoneaster</i>

koromiko	<i>Hebe salicifolia</i>
kowhai	<i>Sophora microphylla</i>
lancewood	<i>Pseudopanax crassifolius</i>
lawyer	<i>Rubus schmidelioides</i>
leafless lawyer	<i>Rubus squarrosus</i>
leather-leaf fern	<i>Pyrrosia eleagnifolia</i>
lemonwood	<i>Pittosporum eugenioides</i>
lowland ribbonwood	<i>Plagianthus regius</i>
mahoe/whiteywood	<i>Melicytus ramiflorus</i>
male fern*	<i>Dryopteris filix-mas</i>
manuka	<i>Leptospermum scoparium</i>
Maori onion	<i>Bulbinella angustifolia</i>
mapou	<i>Myrsine australis</i>
marbleleaf/putaputaweta	<i>Carpodetus serratus</i>
matagouri	<i>Discaria toumatou</i>
matai/black pine	<i>Prumnopitys taxifolia</i>
matipo/kohuhu	<i>Pittosporum tenuifolium</i>
mingimingi	<i>Cyathodes juniperina</i>
mistletoe	<i>Ileostylis micranthus</i>
mountain akeake	<i>Olearia avicenniifolia</i>
mountain beech	<i>Nothofagus solandri</i> var. <i>cliffortioides</i>
mountain kiokio	<i>Blechnum montanum</i>
mountain ribbonwood	<i>Hoheria lyallii</i>
mountain totara/Hall's totara	<i>Podocarpus hallii</i>
mountain wineberry	<i>Aristotelia fruticosa</i>
mouse-ear hawkweed*	<i>Hieracium pilosella</i>
narrow-leaved lacebark	<i>Hoheria angustifolia</i>
narrow-leaved mahoe	<i>Melicytus lanceolatus</i>
narrow-leaved snow-tussock	<i>Chionochloa rigida</i>
native broom	<i>Carmichaelia australis</i>
native jasmine	<i>Parsonsia</i> sp.
necklace fern	<i>Asplenium flabellifolium</i>
nettle*	<i>Urtica</i> sp.
nodding thistle*	<i>Carduus nutans</i>
pate	<i>Schefflera digitata</i>
patotara	<i>Leucopogon fraseri</i>
pennywort	<i>Hydrocotyle novae-zeelandiae</i>
poataniwha	<i>Melicope simplex</i>
pohuehue	<i>Muehlenbeckia australis</i>
pokaka	<i>Elaeocarpus hookerianus</i>
poplar*	<i>Populus</i> sp.
porcupine shrub	<i>Melicytus alpinus</i>
poroporo	<i>Solanum laciniatum</i>
prickly shield fern	<i>Polystichum vestitum</i>
pukio	<i>Carex secta</i>
radiata pine*	<i>Pinus radiata</i>
rautahi	<i>Carex coriacea</i>
rohutu	<i>Neomyrtus pedunculatus</i>
Scotch thistle*	<i>Cirsium vulgare</i>
scrambling broom	<i>Carmichaelia kirkii</i>
scrambling fuchsia	<i>Fuchsia perscandens</i>
scrub pohuehue	<i>Muehlenbeckia complexa</i>
sedge	<i>Carex</i> sp.
shrubby mahoe	<i>Melicytus micranthus</i>
silver fern/ponga	<i>Cyathea dealbata</i>
silver tussock	<i>Poa cita</i>
soft rush*	<i>Juncus effusus</i>
soft tree fern	<i>Cyathea smithii</i>
spindle tree*	<i>Euonymus europaeus</i>
supplejack	<i>Ripogonum scandens</i>

swamp kiokio	<i>Blechnum minus</i>
sweet brier*	<i>Rosa rubiginosa</i>
sycamore*	<i>Acer pseudoplatanus</i>
tauhinu.....	<i>Ozothamnus leptophyllus</i>
thousand-leaved fern	<i>Hypolepis millefolium</i>
three-finger.....	<i>Pseudopanax colensoi</i>
toatoa.....	<i>Haloragis erecta</i>
toetoe.....	<i>Cortaderia richardii</i>
totara	<i>Podocarpus totara</i>
turepo	<i>Streblus heterophyllus</i>
tutsan*	<i>Hypericum androsaemum</i>
tutu	<i>Coriaria sarmentosa</i>
wall lettuce*	<i>Mycelis muralis</i>
water fern	<i>Hystiopteris incisa</i>
wattle*	<i>Acacia</i> sp.
weeping mapou	<i>Myrsine divaricata</i>
wheki-ponga.....	<i>Dicksonia fibrosa</i>
white climbing rata.....	<i>Metrosideros diffusa</i>
wineberry	<i>Aristotelia serrata</i>
yellowwood.....	<i>Coprosma linariifolia</i>
Yorkshire fog*	<i>Holcus lanatus</i>