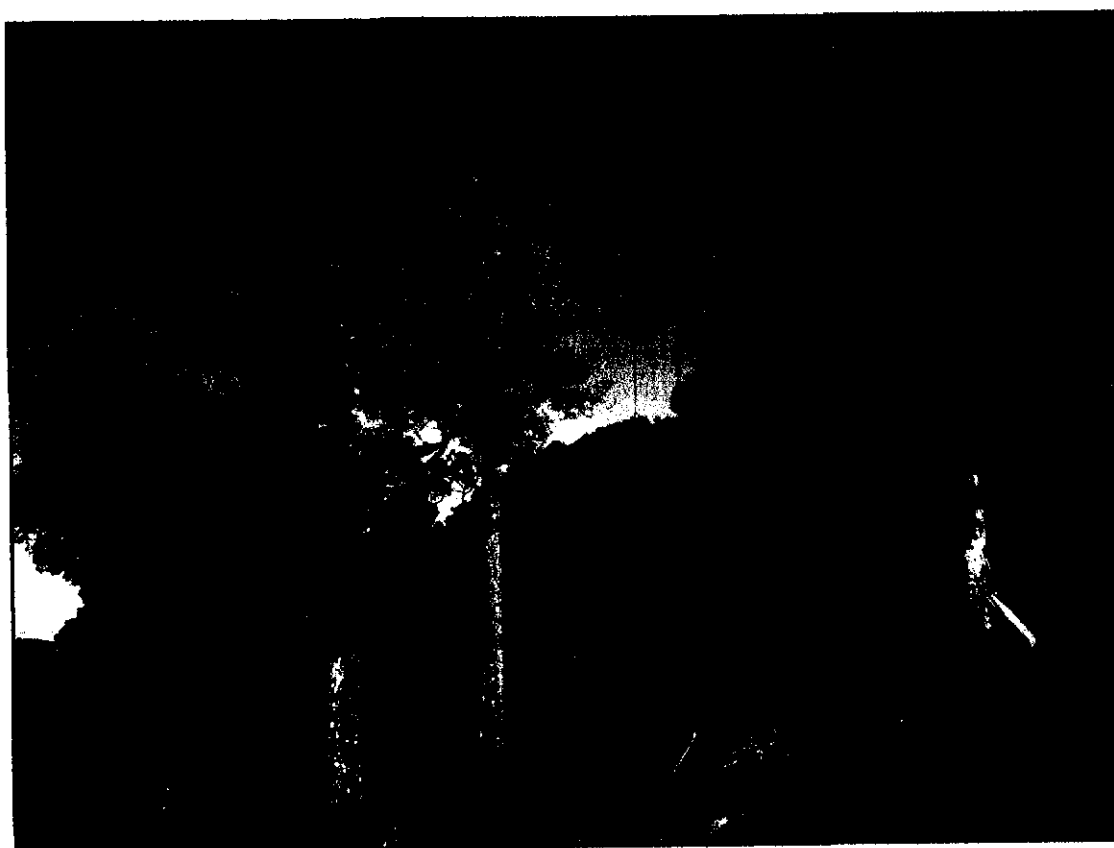




TIMARU DISTRICT

SIGNIFICANT NATURAL AREAS
SURVEY

KAKAHU BUSH
GAMA FOUNDATION
(GRANT AND MARILYN NELSON)



Report prepared for Timaru District Council by Mike Harding
August 2009

TIMARU DISTRICT SIGNIFICANT NATURAL AREAS SURVEY

PROPERTY REPORT

PROPERTY DETAILS:

Owner: Grant and Marilyn Nelson (Gama Foundation)
Valuation References: 24670/217.00 and 24670/233.00
Address: Hall Road, Kakahu Bush
Location: Dissected hill country on the lower southeast slopes of Kakahu Hill, near Kakahu Bush
Ecological District:..... Geraldine Ecological District.
TDC Land Type: Soft Rock Hills and Downs.
Land Environment: N3 (eastern South Island undulating plains and hills).

ECOLOGICAL CONTEXT:

The property covers hill country in the Kakahu Bush area in South Canterbury, comprising loess-covered hills. It includes the catchments of small streams that flow southeast to the Kakahu River. The property lies in the central inland part of Geraldine Ecological District.

It is likely that the original vegetation of this area was predominantly mixed podocarp-hardwood forest with smaller areas of scrub, shrubland, wetland and rock bluff flora. This is the part of the Geraldine Ecological District with the largest remaining areas of indigenous forest. Nevertheless, indigenous forest is still generally confined to small remnants in gullies and around bluffs, with some larger areas of younger regenerating forest.

The indigenous fauna would have originally been significantly more numerous and diverse, with a greater range of birds, lizards and invertebrates than is presently found in the area. The property lies within the known range of the South Canterbury population of long-tailed bat. This species is listed as nationally-endangered.

Indigenous vegetation on the property comprises areas of podocarp-hardwood forest, kanuka forest, shrubland, limestone bluff vegetation and small wetlands. The property lies close to other important indigenous forest remnants on limestone scarps.

SIGNIFICANT AREAS ON THE PROPERTY:

The property was surveyed as part of the District-wide survey of Significant Natural Areas during May and July 2009. Nearly all parts of the property were visited and assessed. Ten mostly inter-connected areas, totalling approximately 87 hectares, are regarded as Significant Natural Areas (SNAs) when assessed against the District Plan criteria. These SNAs are listed in the table below.

Area No.	Area Name	Central grid reference	Aprox. size (ha)	Vegetation/habitat type
8a	Northwest gullies	J38: 552-726	9.27	podocarp-hardwood forest
8b	Pinnacles	J38: 552-722	27.12	podocarp-hardwood forest
8c	Upper Kakahu gorge	J38: 551-715	25.89	podocarp-hardwood forest
9a	Northern gully	J38: 557-729	0.71	podocarp-hardwood forest
9b	Middle gully	J38: 556-728	3.13	podocarp-hardwood forest
9c	Southern gully	J38: 555-726	4.4	podocarp-hardwood forest

170a	Gama Escarpment block	J38: 557-712	5.1	podocarp-hardwood forest
173b	Hall Road wetland	J38: 575-711	2.55	sedgeland; rushland; shrubland
291a		J38: 547-724	1.19	hardwood forest
335a	Lower Kakahu gorge	J38: 569-712	7.79	hardwood forest

These 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 most are considered to be sustainable in the long term, or sustainable with appropriate management (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 of indigenous vegetation or habitat 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. Any questions regarding the protection, management and use of SNAs should be directed to the District Planner. It is expected that SNAs will eventually be listed in the District Plan by way of a notified plan change.

Kakahu Bush-Gama
24670/233.00



291a

8a

9a

9b

9c

8b1

8c

8b2

Meters
0 75 150 300

1:7,500



Kakahu Bush-Gama
24670/217.00

Merceditt Road

335a

170a

173b

Winchester Hanging Rock Road



1:7,500

TIMARU DISTRICT SNA SURVEY

AREA 8a

Area Name: Northwest Gullies
Location (central map reference): J38: 552-726
Ecological District: Geraldine
Surveyors: Mike Harding

Property: Gama Foundation (Nelson)
Nearest Locality: Kakahu Bush
Area Size (ha): 9.27 **Altitude (m):** 280-320
Survey Time: 2½ hours **Survey Date:** 20-07-09

General Description:

This SNA lies in the small gullies northwest of the Pinnacles Lookout at the northwest corner of the property, in the Forest Block. Forest and scrub on the adjacent Pinnacles is described separately as SNA 8b.

Plant Communities:

Two main plant communities are present: kanuka forest and podocarp-hardwood forest. These plant communities are described separately for each of the three gullies below. Naturalized (exotic) species are indicated with an asterisk*.

Northern Gully:

The forest canopy here is dominated by kanuka. Other canopy species present are totara, matipo, broadleaf, mahoe, cabbage tree, bush lawyer, pohuehue, native jasmine and, near the forest margin, emergent radiata pine*. Large crack willow* trees are present along the stream.

The dominant understorey species is *Coprosma rhamnoides*. Other understorey species present are *Coprosma crassifolia*, *Coprosma rotundifolia*, lancewood, matipo, mahoe, marbleleaf, wineberry, *Calystegia tuguriorum*, bush lawyer, blackberry*, elderberry*, Himalayan honeysuckle* and hound's tongue fern.

Groundcover species are necklace fern, *Hypolepis ambigua*, prickly shield fern, common shield fern, *Blechnum fluviatile*, male fern*, foxglove*, pennywort and seedlings of matipo, mapou, lancewood, broadleaf, mahoe and native jasmine.

Additional species present at the forest margins are *Coprosma tayloriae* and gorse*. Species commonly present alongside the small stream are fuchsia, wineberry, marbleleaf, pate, bracken, *Blechnum penna-marina*, *Hypolepis ambigua* and bidibid.

Central Gully:

The forest canopy here is also dominated by kanuka. Trunk diameters (at breast height) of the larger kanuka trees are between 25 and 35 cm. Other canopy species present are lemonwood, lancewood, matipo, mapou, wineberry, broadleaf, cabbage tree, fuchsia, yellowwood, bush lawyer, native jasmine, pohuehue and emergent young totara.

Important understorey species are *Coprosma rhamnoides*, *Coprosma rotundifolia* and mahoe. Other understorey species present are five-finger, lancewood, pate, wineberry, mapou, marbleleaf, yellowwood, totara, *Coprosma crassifolia*, mistletoe (on *Coprosma rotundifolia*), Himalayan honeysuckle*, bush lawyer, *Clematis paniculata*, Chilean flame creeper* and native jasmine.

Groundcover species are *Libertia ixioides*, hen and chickens fern, *Asplenium hookerianum*, common shield fern, prickly shield fern, *Pellaea rotundifolia*, *Blechnum fluviatile*, necklace fern, wall lettuce*, foxglove*, bidibid and seedlings of broadleaf, mahoe, matipo, five-finger, totara and *Coprosma* species.

Gorse* scrub is present at the forest margin. Other species present here are broom*, bracken and, at the western end, young self-sown Douglas fir* trees. Large crack willow* trees are present along the stream. Other species present here are *Blechnum chambersii* and *Carex* sp.

Southern Gully:

The forest canopy here is dominated in most places by kanuka. Other canopy species present are lemonwood, broadleaf, marbleleaf, five-finger, totara, lancewood, matipo, cabbage tree, wineberry, fuchsia, yellowwood, pohuehue and emergent old matai and kahikatea trees. Trunk diameters (cm at breast height) of the larger trees are: kanuka, 30-40; matai, 80 to 98; and kahikatea, 115.

The dominant understorey species in most places is *Coprosma rhamnoides*. Other understorey species present are *Coprosma rotundifolia*, *Coprosma crassifolia*, *Calystegia tuguriorum*, broadleaf, mahoe, shrubby mahoe, horopito, five-finger, mapou, lemonwood, turepo, *Helichrysum lanceolatum*, mingimingi, pate and saplings of matai.

Groundcover species are necklace fern, hen and chickens fern, hanging spleenwort, *Asplenium richardii*, *Asplenium hookerianum*, common shield fern, prickly shield fern, *Hypolepis ambigua*, *Pellaea rotundifolia*, bidibid, *Carex* sp. and seedlings of five-finger, broadleaf, mahoe, lancewood, mapou, totara, matai, native jasmine and *Coprosma* species.

Species present at the forest margins are gorse*, blackberry*, mapou, mahoe, *Coprosma rotundifolia* and *Coprosma rhamnoides*. Additional species alongside the stream are kowhai, narrow-leaved lacebark (hybrid with lowland ribbonwood?), poroporo, *Blechnum fluviatile*, pennywort and nettle.

Birds/Fauna Observed:

Native birds observed during this survey were bellbird, rifleman, silvereye, fantail, brown creeper, grey warbler, harrier and paradise duck.

Notable Flora, Fauna and Habitats:

Important features of this area are the presence of old (original) podocarps (kahikatea and matai), podocarp regeneration (including totara), one at-risk bird species (rifleman), the habitat the area provides for forest birds and the contribution the area makes to the network of habitat in the wider area.

Notable Plant and Animal Pests:

Crack willow and gorse are the most prominent plant pests present, though neither species poses a significant threat to existing areas of forest. Removal of crack willow may enable establishment of indigenous species along the stream margins in the upper gullies. Retention of the gorse scrub will facilitate regeneration of indigenous woody species. Animal pests were not surveyed.

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

These areas of forest are well protected and buffered by their locations in gullies. Most boundaries are fenced, though not all fences are stock-proof. Grazing effects are more apparent in the northern gully. Indigenous vegetation in these gullies is contiguous with a much larger area of indigenous forest down-valley in SNA 8b and on the adjoining property (SNA 8d).

Condition and Management Issues:

The forest canopy and understorey are in good condition, except for the more open understorey in the northern gully. The main management issues are maintenance of boundary fences, continued animal pest control and containment or removal of crack willow.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M/H	A very good example of indigenous forest typical of the ecological district and including original canopy and emergent species (notably old kahikatea and matai trees).
Rarity	M	Provides good habitat for an 'at risk' species (rifleman) and may provide habitat for a 'nationally-endangered' species (long-tailed bat).
Diversity and pattern	M/H	A diverse range of plant species is present: 54 species.
Distinctiveness/special features	M	The presence of tall old podocarp (kahikatea and matai) trees is a special feature.
Other Criteria		
Size/shape	M/H	A moderate-sized area that is well buffered.
Connectivity	M/H	Adjoins other protected indigenous forest.
Long-term Sustainability	M/H	Some plant and animal pest control is probably required to maintain ecological values in the long term.

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

This area is protected by a QEII Open Space Covenant.

Discussion:

This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the presence of old (original) podocarps (kahikatea and matai), podocarp regeneration (including totara), one at-risk bird species (rifleman), the habitat the area provides for forest birds and the contribution the area makes to the network of habitat in the wider area.



SNA 8a (foreground) and SNA 8b (rear)

TIMARU DISTRICT SNA SURVEY

AREA 8b

Area Name: Pinnacles

Location (central map reference): J38: 552-722

Ecological District: Geraldine

Surveyors: Mike Harding

Property: Gama Foundation (Nelson)

Nearest Locality: Kakahu Bush

Area Size (ha): 27.12

Altitude (m): 260-325

Survey Time: 2 hours

Survey Date: 20-07-09

General Description:

This SNA lies on the moderately-steep slopes and summits of the Pinnacles and the main summit to the south. It adjoins SNA 8a, which covers the upper part of the main valley, SNA 8c, which covers two gullies to the south, and SNA 8d on the adjacent property. SNA 8b also includes a rectangular parcel of land to the southeast (SNA 8b2).

Plant Communities:

Two main plant communities are present: podocarp-hardwood forest and kanuka forest. These plant communities are described separately below. Naturalized (exotic) species are indicated with an asterisk*.

Podocarp-hardwood forest:

This plant community is present on the southeast slopes of the Pinnacles. It comprises old tall trees of kahikatea, matai, totara and pokaka emergent over a hardwood forest canopy. It covers a relatively small area and grades to tall kanuka forest on lower slopes and low-stature scrub (including gorse*) on the Pinnacles summit.

Dominant canopy species are mahoe, kanuka and pohuehue. Other important species are lemonwood, native jasmine and *Coprosma rotundifolia*. Canopy species present on the steep lower slopes are totara, broadleaf, lancewood, kanuka, lemonwood, matipo, mapou, cabbage tree, five-finger, pohuehue, native jasmine and bush lawyer.

The forest understorey on these rocky slopes is sparse and depleted at present, largely due to the recent effects of feral goats. Species present are *Coprosma rotundifolia*, *Coprosma crassifolia* and *Coprosma rhamnoides*. Ground-cover species are necklace fern, hen and chickens fern, hanging spleenwort, *Asplenium hookerianum*, common shield fern, *Pellaea rotundifolia*, white-climbing rata and (mostly-browsed) seedlings of native jasmine, mapou and mahoe.

Pinnacles kanuka forest:

Kanuka forest in the vicinity of the Pinnacles is dominated by tall kanuka trees. Other canopy species are totara, with trunk diameters (at breast height) of 45 to 55 cm, fuchsia, mahoe, broadleaf, wineberry, native jasmine, bush lawyer and pohuehue.

The forest understorey is dominated by mahoe and/or *Coprosma rotundifolia*. Other understorey species are *Coprosma crassifolia*, *Coprosma rhamnoides*, *Coprosma areolata*, poataniwha, marbleleaf, mapou, lemonwood, five-finger, native jasmine, bush lawyer and saplings of totara.

Ground-cover species present are prickly shield fern, hen and chickens fern, necklace fern, hanging spleenwort, *Libertia ixioides*, bidibid, hookgrass, pennywort and *Carex* sp.

Species present on the forest margin or in forest openings are *Coprosma crassifolia*, *Coprosma rhamnoides*, *Coprosma rigida*, poroporo, gorse*, elderberry*, pomaderris*, Himalayan honeysuckle*, *Hypolepis ambigua*, horehound*, bush lawyer, *Calystegia tuguriorum* and blackberry*.

Other kanuka forest:

Tall kanuka forest in the vicinity of the southern summit and in the rectangular block (SNA 8b2) is dominated by kanuka, with trunk diameters (at breast height) between 20 and 25 cm. Other canopy species are lancewood, mahoe, lemonwood, bush lawyer and native jasmine.

The forest understorey is dominated by mahoe, *Coprosma rotundifolia* and *Coprosma rhamnoides*. Other understorey species present are *Coprosma crassifolia*, *Coprosma tayloriae*, mapou, matipo, lemonwood,

marbleleaf, wineberry, lancewood, gorse*, poroporo, Himalayan honeysuckle*, bush lawyer, lawyer and saplings of totara.

Ground-cover species are *Hypolepis ambigua*, male fern*, hen and chickens fern, hairy pennywort, bidibid, *Carex* sp., foxglove* and seedlings of broadleaf, mapou, matipo, five-finger, totara and *Coprosma* species.

Species present at the forest margin and in forest openings are yellowwood, *Coprosma propinqua*, mingimingi, *Helichrysum lanceolatum*, bracken, blackberry*, fuchsia, scrub pohuehue, necklace fern, *Pellaea rotundifolia*, hard fern, *Hypolepis ambigua* and, in places, pomaderris*.

Additional species present at damper sites are pate, *Blechnum fluviatile*, kiokio, mountain kiokio, crown fern, *Blechnum penna-marina* and prickly shield fern.

Birds/Fauna Observed:

Native birds observed during this survey were bellbird, kereru, fantail, grey warbler, rifleman, brown creeper and silvereye. A karearea/NZ falcon was heard calling from this area. Several black shags were observed in the canopy of a tall pine tree at the southern edge of this area, above the Kakahu River gorge.

Notable Flora, Fauna and Habitats:

Important features of this area are the diversity of indigenous species present (57 species), the presence of tall old podocarp trees and podocarp (totara) regeneration, locally uncommon plant species (kiokio, mountain kiokio and crown fern), threatened bird species: falcon (nationally vulnerable), two 'at risk' bird species (rifleman and black shag), the habitat the area provides for forest birds including kereru and the contribution the area makes to fauna habitat in the wider area. The area also includes a spectacular outcrop of jaspillite.

Notable Plant and Animal Pests:

No significant plant pests are present. Animal pests were not surveyed. However, a group of feral goats was present on the steep slopes of the Pinnacles at the time of survey.

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

The area is reasonably well buffered by its location on steep slopes. Most boundaries are securely fenced. The area adjoins other areas of protected indigenous forest.

Condition and Management Issues:

The main current management issue is removal of feral goats.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M/H	A good example of indigenous forest typical of the ecological district, including areas with original podocarp trees.
Rarity	M/H	Provides habitat for one threatened and two 'at risk' bird species. May provide habitat for long-tailed bat (nationally endangered). Supports several locally-uncommon plant species.
Diversity and pattern	M/H	A high diversity of plant species (57 species) and habitats are present.
Distinctiveness/special features	M/H	The rock outcrops are a distinctive and spectacular feature.
Other Criteria		
Size/shape	H	A moderate-sized area that is well buffered and has a good shape.
Connectivity	H	Adjoins other areas of protected indigenous forest on most boundaries.
Long-term Sustainability	M/H	Some plant and animal pest control will be required to maintain ecological values in the long term.

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

This area is protected by a QEII Open Space Covenant.

Discussion:

This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are diversity of indigenous species present (57 species), the presence of tall old podocarp trees and podocarp (totara) regeneration, locally uncommon plant species (kiokio, mountain kiokio and crown fern), threatened bird species: falcon (nationally vulnerable), two 'at risk' bird species (rifleman and black shag), the habitat the area provides for forest birds including kereru and the contribution the area makes to fauna habitat in the wider area.



The Pinnacles (SNA 8b)

TIMARU DISTRICT SNA SURVEY

AREA 8c

Area Name: Upper Kakahu Gorge
Location (central map reference): J38: 551-715
Ecological District: Geraldine
Surveyors: Mike Harding

Property: Gama Foundation (Nelson)
Nearest Locality: Kakahu Bush
Area Size (ha): 25.89 **Altitude (m):** 150-280
Survey Time: 3 hours **Survey Date:** 28-07-09

General Description:

This SNA lies in two gullies and on the steep slopes of the upper Kakahu River gorge at the southwest corner of the property. It adjoins SNA 8b at its northeast boundary and SNA 8d on the eastern property boundary.

Plant Communities:

Two main plant communities are present: podocarp-hardwood forest and tall kanuka forest. These plant communities are described together below, because they merge with one another throughout the site. Naturalized (exotic) species are indicated with an asterisk*.

The forest canopy is, in areas of younger forest, dominated by tall kanuka. Trunk diameters (at breast height) of the larger kanuka trees mostly range between 25 and 35 cm. At other locations podocarps are emergent over a forest canopy of hardwood trees and kanuka, notably in the main western gully and adjacent to Kakahu River. Trunk diameters of the emergent kahikatea trees range between 100 and 110 cm. Totara trees near the Kakahu River were not measured. Younger kahikatea and totara trees on the spur at the western edge of the site have trunk diameters between 20 and 30 cm.

Other canopy species present are broadleaf, lancewood, mahoe, lemonwood, cabbage tree, marbleleaf, kowhai, wineberry, fuchsia, narrow-leaved lacebark, bush lawyer, pohuehue and native jasmine. Emergent pine trees are present at the eastern edge of the site.

Understorey species commonly present at the site are *Coprosma rotundifolia*, *Coprosma rhamnoides*, *Coprosma crassifolia* and mahoe. Other understorey species present are yellowwood, lancewood, matipo, marbleleaf, lemonwood, mapou, weeping mapou, shrubby mahoe, rohutu, *Neomyrtus pedunculatus*, *Helichrysum lanceolatum*, poataniwha, mingimingi, *Coprosma rigida*, wineberry, fuchsia, blackberry*, native jasmine, lawyer, bush lawyer, *Calystegia tuguriorum*, pohuehue, scrub pohuehue, *Clematis paniculata*, *Clematis foetida*, *Clematis marata*, mistletoe (on *Coprosma crassifolia*) and saplings of totara, kahikatea and matai.

Ground-cover species present are prickly shield fern, common shield fern, *Blechnum fluviatile*, *Blechnum minus*, *Blechnum penna-marina*, *Blechnum chambersii*, hen and chickens fern, necklace fern, hanging spleenwort, *Asplenium hookerianum*, *Asplenium richardii*, *Pellaea rotundifolia*, hound's tongue fern, male fern*, *Libertia ixioides*, bidibid, pennywort, *Haloragis erecta*, foxglove*, *Carex* sp. and seedlings of lancewood, mahoe, mapou, lemonwood, wineberry, pate, five-finger, kowhai, kahikatea, totara, native jasmine and *Coprosma* species.

The margins of the forest are, in most places, dominated by gorse* and blackberry*. Other species present at the forest margins and in forest openings are *Coprosma tayloriae*, *Coprosma propinqua*, *Coprosma rigida*, *Hypolepis ambigua*, broom*, Himalayan honeysuckle*, pomaderris*, bracken, hard fern, pohuehue, scrub pohuehue, lawyer and bush lawyer. Periwinkle* is present at one location on the forest edge above the Kakahu Gorge (near the Bullocky Jones house site).

Birds/Fauna Observed:

Native birds observed during this survey were bellbird, grey warbler, rifleman, kereru, brown creeper and fantail. Black shags were observed in the crowns of emergent pine trees overlooking Kakahu River. Artificial bat-roost boxes are present in the young podocarp forest on the western spur.

Notable Flora, Fauna and Habitats:

Important features of this area are the diversity of indigenous species present (63 species), the presence of tall old podocarp trees and podocarp regeneration, locally uncommon plant species (*Blechnum minus* and *Haloragis erecta*), two 'at risk' bird species (rifleman and black shag), the habitat the area provides for forest

birds including kereru, the likely habitat the area provides for long-tailed bat (a nationally-endangered species) and the contribution the area makes to fauna habitat in the wider area.

Notable Plant and Animal Pests:

Plant pests that are present do not pose a significant threat to the indigenous forest. Animal pests were not surveyed, though a group of feral goats was observed nearby in SNA 8b.

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

The area is well buffered by its location in small gullies and on the steeper slopes of the Kakahu Gorge. It adjoins other areas of indigenous forest on this and other properties and makes an important contribution to the network of fauna habitat in the area.

Condition and Management Issues:

The forest is mostly in good condition with good regeneration of canopy species including podocarps. The main management issue is continued control of animal pests.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M/H	A good example of indigenous forest typical of the ecological district, including areas with original podocarp trees and podocarp regeneration. Provides habitat for two 'at risk' bird species. May provide habitat for long-tailed bat (nationally endangered). Supports two locally-uncommon plant species.
Rarity	M/H	
Diversity and pattern	M/H	A high diversity of plant species (63 species) and habitats are present.
Distinctiveness/special features	M/H	The forest in the gorge (not inspected closely) appears intact and interesting.
Other Criteria		
Size/shape	H	A moderate-sized area that is well buffered and has a good shape.
Connectivity	H	Adjoins other areas of protected indigenous forest on most boundaries.
Long-term Sustainability	M/H	Some plant and animal pest control will be required to maintain ecological values in the long term.

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

This area is protected by a QEII Open Space Covenant.

Discussion:

This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the diversity of indigenous species present (63 species), the presence of tall old podocarp trees and podocarp regeneration, locally uncommon plant species (*Blechnum minus* and *Haloragis erecta*), two 'at risk' bird species (rifleman and black shag), the habitat the area provides for forest birds including kereru, the likely habitat the area provides for long-tailed bat (a nationally-endangered species) and the contribution the area makes to fauna habitat in the wider area.

TIMARU DISTRICT SNA SURVEY

AREA 9a

Area Name: Northern Gully

Location (central map reference): J38: 557-729

Ecological District: Geraldine

Surveyors: Mike Harding

Property: Gama Foundation (Nelson)

Nearest Locality: Kakahu Bush

Area Size (ha): 0.71

Altitude (m): 260-300

Survey Time: ½ hour

Survey Date: 20-07-09

General Description:

This SNA lies in the head of a small gully on the eastern slopes of Kakahu Hill, at the northeast corner of the property. It adjoins a more extensive area of indigenous forest on an adjoining property (SNA 9d). This area is protected by a QEII Open Space covenant.

Plant Communities:

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

The forest canopy is dominated by tall kanuka. Other canopy species present are totara, mahoe, lemonwood, cabbage tree, broadleaf, fuchsia and pohuehue. One old emergent kahikatea tree is present in the gully. The trunk diameter (at breast height) of this tree is 76 cm.

The understorey is dominated by mahoe and *Coprosma rotundifolia*. Other understorey species are, *Coprosma areolata*, *Coprosma crassifolia*, *Coprosma rhamnoides*, marbleleaf, fuchsia, pate, five-finger, wineberry, white climbing rata, turepo, mapou, rohutu, lemonwood, bush lawyer and saplings of totara.

Groundcover species present are white climbing rata, common shield fern, hen and chickens fern, necklace fern, *Asplenium hookerianum*, *Asplenium richardii*, *Pellaea rotundifolia*, foxglove*, black nightshade*, blackberry*, *Carex solandri*, hairy pennywort and seedlings of mahoe, matipo, wineberry and native jasmine.

Species generally restricted to the gully bottom, near the small stream, are *Blechnum fluviatile*, poroporo, prickly shield fern, *Hypolepis ambigua*, male fern*, hookgrass and pennywort.

Species commonly present on the forest margin are *Coprosma propinqua*, gorse*, pomaderris*, *Calystegia tuguriorum*, bush lawyer and pohuehue.

Birds/Fauna Observed:

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

Notable Flora, Fauna and Habitats:

Important features of this area are the presence of a remnant kahikatea tree and young totara trees, the health and diversity of the forest notably the forest understorey, the habitat the area provides for forest birds and its location adjacent to a larger area of indigenous forest. The taller trees may also provide roost sites for long-tailed bat (a 'nationally-endangered' species that is present in the area).

Notable Plant and Animal Pests:

Pomaderris is the most obvious plant pest present. However, this species appears to be largely confined to the tall kanuka at the forest margin and its presence does not appear to be hindering regeneration of indigenous species. Other naturalised species present do not pose a significant threat to the forest. Animal pests were not surveyed.

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

This area of forest is well buffered by its location in a gully. The boundaries are fenced and the forest does not appear to have been grazed for some years. This area of forest is an extension of a larger area of forest on the adjoining property.

Condition and Management Issues:

The forest in this SNA is in very good condition. Fence maintenance, regular animal pest (especially possum) control and monitoring of the pomaderris infestation are the main management priorities.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M/H	A good example of indigenous forest typical of the ecological district containing species representative of the forest originally present at such sites.
Rarity	M	Provides good habitat for an 'at risk' species (rifleman), may provide habitat for a 'nationally-endangered' species (long-tailed bat).
Diversity and pattern	M	Supports a relatively diverse range of plant species.
Distinctiveness/special features	M	The presence of podocarps (an old kahikatea trees and young totara trees) is a special feature.
Other Criteria		
Size/shape	M	A small area that is very well buffered and protected.
Connectivity	M/H	Adjoins other protected indigenous forest.
Long-term Sustainability	M/H	Continued animal pest control will probably be necessary to maintain the ecological values of the area in the long term.

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

This area has been well maintained by the landowner and is protected by a QEII Open Space covenant. It has limited 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 remnant kahikatea tree and young totara trees, the health and diversity of the forest notably the forest understorey, the habitat the area provides for forest birds and its location adjacent to a larger area of indigenous forest. The taller trees may also provide roost sites for long-tailed bat (a 'nationally-endangered' species that is present in the area).

TIMARU DISTRICT SNA SURVEY

AREA 9b

Area Name: Middle Gully
Location (central map reference): J38: 556-728
Ecological District: Geraldine
Surveyors: Mike Harding

Property: Gama Foundation (Nelson)
Nearest Locality: Kakahu Bush
Area Size (ha): 3.13 **Altitude (m):** 260-320
Survey Time: 1 hour **Survey Date:** 04-05-09

General Description:

This SNA lies in the head of a small gully on the eastern slopes of Kakahu Hill, at the northeast corner of the property. It adjoins a more extensive area of indigenous forest on an adjoining property (SNA 9d). This area is protected by a QEII Open Space Covenant.

Plant Communities:

Two main plant communities are present: tall kanuka forest on the spurs at the gully sides; and mixed podocarp-hardwood forest in the gully. These plant communities are described separately below. Naturalized (exotic) species are indicated with an asterisk*.

The forest canopy at the upper margins of the area is dominated by tall kanuka. Elsewhere, the forest canopy comprises kanuka, totara, kahikatea, lemonwood, five-finger, broadleaf and pohuehue. Three tall old kahikatea trees are present in the gully. Trunk diameters (at breast height) of these trees range between 100 and 120 cm.

The understorey near the forest margin is dominated by mahoe and patches of pomaderris*. Elsewhere understorey species are *Coprosma rotundifolia*, *Coprosma areolata*, *Coprosma rhamnoides*, mahoe, mapou, matipo, broadleaf, pate, rohutu, lemonwood, turepo, poataniwha, marbleleaf, cabbage tree, white climbing rata, hanging spleenwort, *Calystegia tuguriorum*, bush lawyer and saplings of totara and matai.

Groundcover species present are white climbing rata, common shield fern, hen and chickens fern, hound's tongue fern, *Hypolepis ambigua*, *Asplenium hookerianum*, *Carex forsteri*, and seedlings of mahoe, lancewood, *Coprosma* spp. and native jasmine.

Species generally restricted to the gully bottom, near the small stream, are fuchsia, wineberry, *Pellaea rotundifolia*, crown fern, *Blechnum fluviatile*, *Blechnum chambersii*, *Leptopteris hymenophylloides*, young plants of silver fern and *Dicksonia* sp. (probably wheki ponga) and seedlings of kahikatea.

Species commonly present on the forest margin and/or in forest openings are *Coprosma crassifolia*, *Coprosma tayloriae*, *Coprosma rotundifolia*, *Coprosma rhamnoides*, lawyer, bush lawyer, *Clematis marata*, foxglove*, black nightshade*, Himalayan honeysuckle*, blackberry*, gorse* and pohuehue.

Birds/Fauna Observed:

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

Notable Flora, Fauna and Habitats:

Important features of this area are the presence of remnant podocarp trees (kahikatea), the health and diversity of the forest notably the forest understorey, the presence of locally uncommon species (tree ferns and *Leptopteris hymenophylloides*), the habitat the area provides for forest birds and its location adjacent to a larger area of indigenous forest. The taller trees may also provide roost sites for long-tailed bat (a 'nationally-endangered' species that is present in the area).

Notable Plant and Animal Pests:

Pomaderris is the most obvious plant pest present. However, this species appears to be largely confined to the tall kanuka at the forest margin and its presence does not appear to be hindering regeneration of indigenous species. Other naturalised species present do not pose a significant threat to the forest. Animal pests were not surveyed.

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

This area of forest is well buffered by its location in a gully. The boundaries are fenced and the forest does not appear to have been grazed for some years. This area of forest is an extension of a larger area of forest on the adjoining property.

Condition and Management Issues:

The forest in this SNA is in very good condition. At the time of survey, the boundary fence was not stock-proof at one location on the northern boundary. Fence maintenance, regular animal pest (especially possum) control and monitoring of the pomaderris infestation are the main management priorities.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	H	A very good example of indigenous forest typical of the ecological district and quite representative of the forest originally present at such sites.
Rarity	M	Provides very good habitat for an 'at risk' species (rifleman) and may provide habitat for a 'nationally-endangered' species (long-tailed bat). Supports at least two locally uncommon plant species.
Diversity and pattern	M/H	Supports a diverse range of plant species in two main habitats: gully-bottom and spur-crest.
Distinctiveness/special features	M	The presence of tall old kahikatea trees and podocarp (totara, matai and kahikatea) regeneration are special features.
Other Criteria		
Size/shape	M/H	A moderate-sized area that is very well buffered and protected.
Connectivity	M/H	Adjoins other protected indigenous forest.
Long-term Sustainability	M/H	Continued animal pest control will probably be necessary to maintain the ecological values of the area in the long term.

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

This area has been well protected and maintained by the landowner. It has limited potential for farm development. The area is protected by a QEII Open Space Covenant.

Discussion:

This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the presence of remnant podocarp trees (kahikatea), the health and diversity of the forest notably the forest understorey, the presence of locally uncommon species (tree ferns and *Leptopteris hymenophylloides*), the habitat the area provides for forest birds and its location adjacent to a larger area of indigenous forest. The taller trees may also provide roost sites for long-tailed bat (a 'nationally-endangered' species present in the area).

TIMARU DISTRICT SNA SURVEY

AREA 9c

Area Name: Southern Gully

Location (central map reference): J38: 555-726

Ecological District: Geraldine

Surveyors: Mike Harding

Property: Gama Foundation (Nelson)

Nearest Locality: Kakahu Bush

Area Size (ha): 4.4

Altitude (m): 260-300

Survey Time: 1 hour

Survey Date: 04-05-09

General Description:

This SNA lies in the head of a small gully on the eastern slopes of Kakahu Hill, at the northeast corner of the property. It adjoins a more extensive area of indigenous forest on an adjoining property (SNA 9d). This area is protected by a QEII Open Space Covenant.

Plant Communities:

Two main plant communities are present: mixed kanuka-podocarp-hardwood forest over most of the area; and dense low-stature pomaderris forest on some north-facing slopes. These plant communities are described separately below. Naturalized (exotic) species are indicated with an asterisk*.

Mixed kanuka-podocarp-hardwood forest:

The forest canopy at the upper margins of the area is dominated by tall kanuka and totara. Other canopy or sub-canopy species present are mahoe, marbleleaf, fuchsia, five-finger, kowhai and pohuehue. Trunk diameters (at breast height) of the upper-slope totara trees are between 50 and 60 cm. The trunk diameter of one large gully-bottom totara is 100 cm. Large emergent trees of matai and pokaka are present further down the gully (viewed from a distance).

The understorey on upper slopes is dominated by *Coprosma rhamnoides* and *Coprosma rotundifolia*. Other understorey species present are *Coprosma crassifolia*, pate, mahoe, five-finger, lemonwood, rohutu, turepo, shrubby mahoe, koromiko, *Helichrysum lanceolatum*, pomaderris*, tutsan* and saplings of totara.

Groundcover species present are hen and chickens fern, common shield fern, hound's tongue fern, necklace fern, hairy pennywort, bidibid, *Carex forsteri*, *Carex solandri*, hookgrass, *Libertia ixioides*, white climbing rata, black nightshade* and seedlings of mahoe, broadleaf, mapou, totara, lancewood, pohuehue and native jasmine.

Dominant species at the gully bottom, near the small stream, are fuchsia, pate, and hen and chickens fern. Other species present here are prickly shield fern, *Blechnum chambersii*, *Pellaea rotundifolia* and the forest-floor herb, *Australina pusilla*.

Additional species present on the forest margin are gorse* and bush lawyer.

Low-stature pomaderris forest:

This community is present in patches, mostly on north-facing slopes. It is dominated by dense pomaderris*, much of which appears to have been flattened by recent snowfalls. Occasional kanuka trees are emergent through the pomaderris canopy. Understorey species present are *Coprosma rhamnoides*, *Coprosma crassifolia*, *Coprosma robusta* x *propinqua*, mahoe, matipo, gorse*, broom*, blackberry*, hen and chickens fern and seedlings of mahoe, lemonwood and totara.

Birds/Fauna Observed:

Native birds observed during this brief survey were bellbird, fantail and rifleman. Kereru and brown creeper were observed in a nearby gully (SNA 9b).

Notable Flora, Fauna and Habitats:

Important features of this area are the presence of remnant podocarp trees (totara and matai), the health and diversity of the forest understorey, the presence of a locally uncommon species (*Australina pusilla*), the habitat the area provides for forest birds and its location adjacent to a larger area of indigenous forest. The

taller trees may also provide roost sites for long-tailed bat (a 'nationally-endangered' species that is present in the area).

Notable Plant and Animal Pests:

Pomaderris is the most obvious plant pest present. However, this species does not appear to be hindering regeneration of indigenous species over most parts of the area. The future of the denser stands of pomaderris is less clear, though indigenous species are present in the understorey. Other naturalised species present do not pose a significant threat to the forest. Animal pests were not surveyed.

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

This area of forest is well buffered by its location in a gully. The boundaries are fenced and the forest does not appear to have been grazed for some years. This area of forest is an extension of a larger area of forest on the adjoining property.

Condition and Management Issues:

The forest in this SNA is in good condition. Fence maintenance, regular animal pest (especially possum) control and monitoring of the pomaderris infestation are the main management priorities.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	H	A very good example of indigenous forest typical of the ecological district and quite representative of the forest originally present at such sites.
Rarity	M	Provides good habitat for an 'at risk' species (rifleman) and may provide habitat for a 'nationally-endangered' species (long-tailed bat). Supports a locally uncommon plant species.
Diversity and pattern	M/H	Supports a diverse range of plant species in two main habitats: gully-bottom and spur-crest.
Distinctiveness/special features	M	The presence of tall old totara, matai and pokaka trees and podocarp (totara) regeneration are special features.
Other Criteria		
Size/shape	M/H	A moderate-sized area that is very well buffered and protected.
Connectivity	M/H	Adjoins other protected indigenous forest.
Long-term Sustainability	M/H	Continued animal pest control will probably be necessary to maintain the ecological values of the area in the long term.

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

This area has been well protected and maintained by the landowner. It has limited potential for farm development. The area is protected by a QEII Open Space Covenant.

Discussion:

This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the presence of remnant podocarp trees (totara and matai), the health and diversity of the forest understorey, the presence of a locally uncommon species (*Australina pusilla*), the habitat the area provides for forest birds and its location adjacent to a larger area of indigenous forest. The taller trees may also provide roost sites for long-tailed bat (a 'nationally-endangered' species present in the area).

TIMARU DISTRICT SNA SURVEY

AREA 170a

Area Name: Gama Escarpment Block
Location (central map reference): J38: 577-712
Ecological District: Geraldine
Surveyors: Mike Harding

Property: Gama Foundation (Nelson)
Nearest Locality: Kakahu Bush
Area Size (ha): 5.1 **Altitude (m):** 110 to 220
Survey Time: 2 hours **Survey Date:** 15-05-09

General Description:

This SNA lies on the west-facing slopes of a prominent limestone scarp in lower Hall Road valley at Kakahu Bush. Upper slopes are steep and precipitous; lower slopes are gentler. Areas of wetland (SNA 173b) are present on the adjacent valley floor.

Plant Communities:

Two main plant communities are present: podocarp-hardwood forest on the slopes; and a stand of kanuka forest at the base of the slope. Shrubland adjoins and links these communities. These plant communities are described separately below. Naturalized (exotic) species are indicated with an asterisk*.

Podocarp-hardwood forest:

This forest occupies the steeper upper slopes on and at the base of the exposed limestone scarp. The forest canopy is dominated by broadleaf, mahoe and pohuehue. Other canopy species present are five-finger, cabbage tree, kowhai, matipo, mapou, totara and near the Kakahu River lowland ribbonwood and crack willow*.

Understorey species present are *Coprosma propinqua*, weeping mapou, elderberry* and hawthorn*.

Species present in open areas within or adjacent to the forest, mostly on exposed limestone rock, are koromiko, blue tussock, *Asplenium lyallii*, maidenhair fern, hound's tongue fern, common shield fern, *Blechnum chambersii*, male fern*, *Clematis marata*, bidibid, bittersweet*, stonecrop*, *Epilobium nummularifolium*, *Schizeilema trifoliolatum* and leafless lawyer.

The lower forest margin supports dense shrubland dominated by *Coprosma propinqua* and matagouri. Other species present in the shrubland are flax, native broom, elderberry*, gooseberry*, broom*, sweet brier*, pohuehue, scrub pohuehue, *Calystegia tuguriorum*, *Clematis forsteri*, *Parsonsia capsularis*, mistletoe (on *Coprosma propinqua*), blackberry*, horehound* and emergent broadleaf, cabbage tree, kowhai, spindle tree* and kanuka. Ivy* is present on limestone near the Kakahu River.

Kanuka Forest:

This small stand of trees comprises a canopy of kanuka trees and a very open understorey with pasture in places. Other species present are pohuehue, cabbage tree, *Coprosma propinqua*, matagouri, scrub pohuehue, blackberry*, nettle* and foxglove*.

Birds/Fauna Observed:

Native birds observed during this survey were silvereye, bellbird, rifleman, grey warbler, fantail, harrier and spur-winged plover. Kereru/NZ pigeon have been observed nearby. The scarp provides good potential roost sites for long-tailed bat.

Notable Flora, Fauna and Habitats:

Important features of this area are the occurrence of indigenous forest on limestone, the extent and diversity of the forest bird habitat including habitat for an 'at risk' species (rifleman), the potential habitat for long tailed bat (a 'nationally-endangered' species) (the SNA is within the range of the South Canterbury population of long-tailed bat), the presence of podocarps (totara), the spectacular limestone landform and the contribution the area makes to fauna habitat in the wider area.

Notable Plant and Animal Pests:

Ivy, hawthorn, crack willow, plum and spindle tree are the main plant pest present, though these species are mostly confined to the forest margin. Old man's beard is present in the area. Animal pests were not surveyed.

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

This SNA is very well buffered by its location on a steep limestone scarp. It lies very close to other areas of indigenous vegetation on the property (SNA 173b), is contiguous with forest on the adjoining property to the north (SNA 170b) and is approximately one kilometre from a very extensive area of indigenous forest at Kakahu Bush.

Condition and Management Issues:

The forest canopy is in good condition. The forest understorey is relatively open. Encouragement of understorey regeneration and removal of invasive plant pests are 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 canopy species (including totara) that are representative of the original vegetation.
Rarity	M/H	Provides habitat for rifleman (at risk) and good potential habitat for long-tailed bat (nationally endangered). Indigenous vegetation on limestone is a nationally-rare ecosystem.
Diversity and pattern	M/H	A diversity of forest, shrubland and rockland species are present.
Distinctiveness/special features	M/H	The limestone scarp is a spectacular landform.
Other Criteria		
Size/shape	M/H	A moderate-sized area that is well buffered.
Connectivity	M/H	Adjoins other indigenous vegetation and makes an important contribution to the network of fauna habitat in the area.
Long-term Sustainability	M	The lack of understorey regeneration and presence of some plant pests may threaten the long-term ecological viability of the area.

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

This area has been formally protected by the landowners by way of a QEII Open Space Covenant.

Discussion:

This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the occurrence of indigenous forest on limestone, the extent and diversity of the forest bird habitat including habitat for an 'at risk' species (rifleman), the potential habitat for long tailed bat (a 'nationally-endangered' species), the presence of podocarps (totara), the spectacular limestone landform and the contribution the area makes to fauna habitat in the wider area.

TIMARU DISTRICT SNA SURVEY

AREA 173b

Area Name: Hall Road Wetland

Location (central map reference): J38: 575-711

Ecological District: Geraldine

Surveyors: Mike Harding

Property: Gama Foundation (Nelson)

Nearest Locality: Kakahu Bush

Area Size (ha): 2.55

Altitude (m): 110

Survey Time: 1 hour

Survey Date: 29-05-09

General Description:

This SNA lies on the valley floor alongside Hall Road, just above the confluence of the Hall Valley stream and the Kakahu River. It comprises a series of hydrologically-connected wetlands and lies adjacent to areas of indigenous forest and shrubland (SNA 170a).

Plant Communities:

Three main wetland areas are present. These are described separately below. Naturalized (exotic) species are indicated with an asterisk*.

The main wetland area on the lower terrace is variously dominated by pukio (*Carex secta*), raupo (*Typha orientalis*), *Carex vigata*?, rautahi (*Carex coriacea*) and Yorkshire fog*. Other important wetland species present are *Juncus gregiflorus*, *Juncus pallidus*?, *Juncus microcephalus*?, toetoe, water cress* (*Rorippa* sp.) and *Azolla filiculoides*. Species present at the wetland margins are bracken, crack willow*, broom* (mostly dead), pohuehue, *Coprosma propinqua*, Californian thistle*, gorse* (mostly dead), kanuka and cocksfoot*.

The second wetland area on a slightly higher (up-valley) terrace is dominated by pukio, rautahi, *Juncus gregiflorus* and pasture grasses. Additional species present are toetoe, gorse* (dead) and kanuka.

A diverse riparian plant community is present on the stream bank close to this wetland. Canopy species present are kanuka, kowhai, matipo, broadleaf and crack willow*. Species present beneath this canopy are koromiko, *Coprosma propinqua*, *Coprosma crassifolia*, *Blechnum chambersii*, *Blechnum fluviatile*, *Blechnum minus*, prickly shield fern, common shield fern, necklace fern and scrub pohuehue.

A third area of wetland vegetation is present on a larger higher terrace. Species present here are pukio, rautahi, bog rush (*Schoenus pauciflorus*), *Juncus gregiflorus*, lotus*, an unidentified sedge and pasture grasses. Present at drier sites are pasture grasses*, kanuka, silver tussock, *Hypolepis ambigua* and pohuehue.

Birds/Fauna Observed:

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

Notable Flora, Fauna and Habitats:

Important features of this area are the extent and health of the wetland vegetation, the contribution the wetlands make to the series of wetlands present in the valley and the proximity of the wetlands to other areas of indigenous vegetation (notably SNA 170a). Lowland wetlands are a nationally-rare ecosystem.

Notable Plant and Animal Pests:

Crack willow, gorse, broom and pasture grasses are the most prominent plant pests present. Most of the gorse and broom is dead, presumably as a result of recent herbicide spray. Animal pests were not surveyed.

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

The wetlands are buffered largely by the extent of the standing water or permanently wet ground. They are part of a larger paddock and grazed lightly, presumably only by sheep. The wetland communities lie close to the stream and adjacent to areas of indigenous shrubland, treeland and forest, notably SNA 170a and the larger and regionally-important Kakahu Bush.

Condition and Management Issues:

The wetland plant communities are in good condition, presumably as a result of the limited grazing and recent plant pest control. Removal or containment of crack willow trees and management of grazing are probably the most important management issues.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

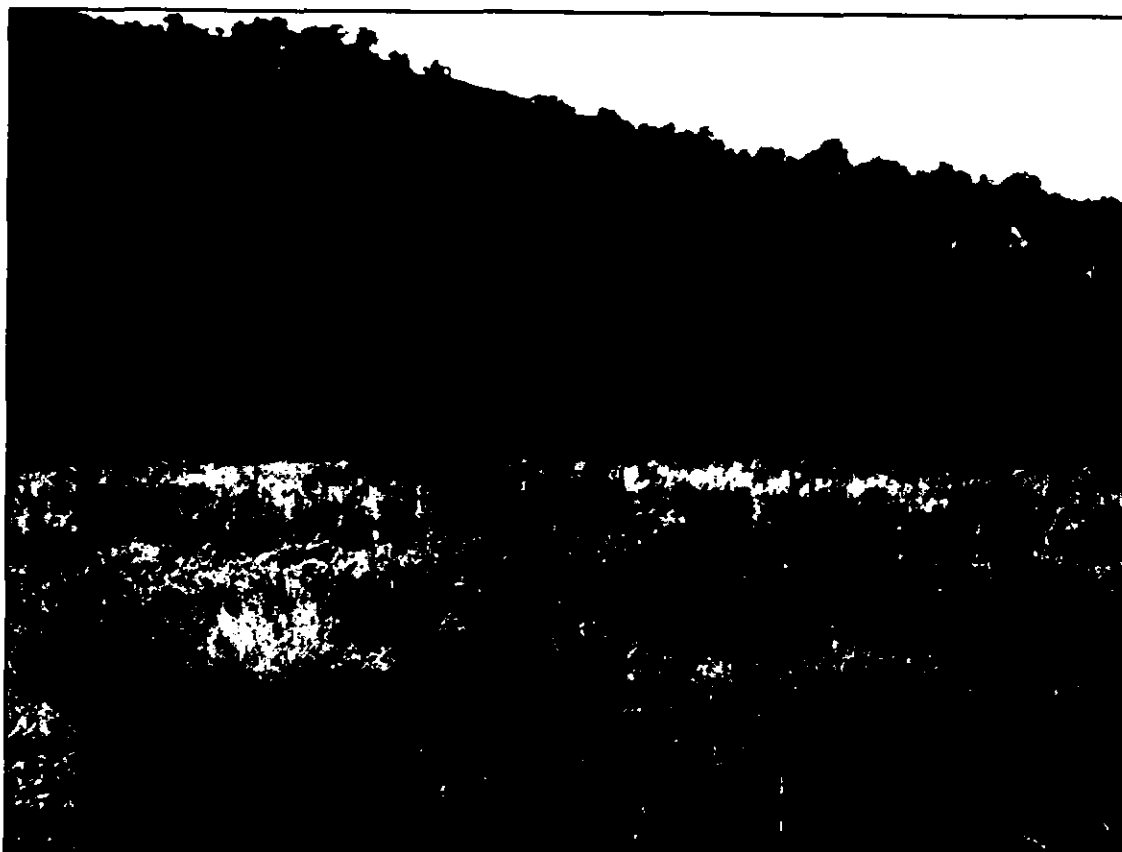
Primary Criteria	Rank	Notes
Representativeness	M/H	A good example of wetland plant communities typical of the ecological district.
Rarity	M	Lowland wetlands are a nationally-rare ecosystem.
Diversity and pattern	M	Relatively diverse wetland plant communities. Diversity is enhanced by the presence of riparian dryland species. Raupo is a locally-uncommon plant species.
Distinctiveness/special features	M	The presence of three different but hydrologically linked wetland communities is a special feature.
Other Criteria		
Size/shape	M/H	Relatively large for a lowland wetland.
Connectivity	M/H	The wetland communities are connected and the SNA adjoins or lies close to other SNAs.
Long-term Sustainability	M	Some plant pest control will probably be necessary to maintain ecological values in the long term.

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

The land parcel in which these wetland communities lie is formally protected by a QEII Open Space Covenant. The management statement for the covenant specifies appropriate land uses and management actions.

Discussion:

This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the extent and health of the wetland vegetation, the contribution the wetlands make to the series of wetlands present in the valley and the proximity of the wetlands to other areas of indigenous vegetation (notably SNA 170a). Lowland wetlands are a nationally-rare ecosystem.



SNA 173b (foreground) and SNA 170a (rear)

TIMARU DISTRICT SNA SURVEY

Wetland Record Form

Wetland 173b

Wetland name: Hall Road Wetlands	Date: 29 May 2009
Property: Gama Foundation (Nelson)	GPS/Grid Ref: J38: 575-711
Altitude: 110 m	No. of plots sampled:
Location: Hall Road valley	Approximate size (ha):

Classification: I System	IA Subsystem	II Wetland Class	IIA Wetland Form
Palustrine	Permanent	Swamp	Basin

Surveyors:

Indicator	Indicator components	Specify and Comment	Score 0-5 ¹	Mean score
Change in hydrological integrity	Impact of manmade structures	None apparent	5	4.67
	Water table depth	No detectable changes	5	
	Dryland plant invasion	Present at margins	4	
Change in physico-chemical parameters	Fire damage	None apparent	5	4.67
	Degree of sedimentation/erosion	None apparent	5	
	Nutrient levels	Some stock nutrient	4	
	von Post index			
Change in ecosystem intactness	Loss in area of original wetland	Some attrition	4	4.5
	Connectivity barriers	No obvious physical barriers	5	
Change in browsing, predation and harvesting regimes	Damage by domestic or feral animals	Some at margins	4	4.33
	Introduced predator impacts on wildlife	Unclear	4	
	Harvesting levels	None apparent	5	
Change in dominance of native plants	Introduced plant canopy cover	Crack willow in places	4	4
	Introduced plant understorey cover	Relatively minor	4	
Total wetland condition index /25				22.17

Main vegetation types: *Carex secta*/*Carex coriacea* sedgeland; *Juncus* rushland; *Typha* reedland

Native fauna: Fantail, kereru and grey warbler.

Other comments:

Pressure	Rating ²	Specify and Comment
Modifications to catchment hydrology	0	None apparent
Water quality within the catchment	2	Possible mild pollution (domestic stock)
Animal access	3	Some impediment
Key undesirable species	2	Crack willow, gorse and broom
% catchment in introduced vegetation	3	More than half
Other pressures	0	None apparent
Total wetland pressure index /30	10	

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 291a

Area Name:

Location (central map reference): J38: 547-724

Ecological District: Geraldine

Surveyors: Mike Harding

Property: Gama Foundation (Nelson)

Nearest Locality: Kakahu Bush

Area Size (ha): 1.2

Altitude (m): 280

Survey Time: ¼ hour

Survey Date: 28-07-09

General Description:

This SNA lies in the head of a gully at the western edge of the property. Most of the site lies on an adjoining property.

Plant Communities:

This area was not surveyed in detail; instead it was viewed from the margin. Most of the area of forest lies on the adjacent property. It is expected that the remainder of the site will be inspected as part of a future survey.

The forest canopy of this part of the area is dominated by kanuka. Other species present are matipo, broadleaf, five-finger, fuchsia, pate, bush lawyer and pohuehue. Gorse* and Himalayan honeysuckle* are present at the margin.

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

This area is buffered by its location in a gully. It is part of a much larger area of indigenous forest that extends down the gully.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

A full assessment of significance awaits survey of the remainder of the site, which lies on an adjoining property.

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

This area is protected by a QEII Open Space Covenant.

Discussion:

This area almost certainly meets the District Plan criteria for a Significant Natural Area, as it is part of a much larger area that appears to have significant values.

TIMARU DISTRICT SNA SURVEY

AREA 335a

Area Name: Lower Kakahu Gorge
Location (central map reference): J38: 569-712
Ecological District: Geraldine
Surveyors: Mike Harding

Property: Gama Foundation (Nelson)
Nearest Locality: Kakahu Bush
Area Size (ha): 7.79 **Altitude (m):** 110-120
Survey Time: 2 hours **Survey Date:** 28-07-09

General Description:

This SNA lies on steep to moderately-steep slopes of the lower gorge of the Kakahu River just west of Hall Road.

Plant Communities:

Two main plant communities are present: tall kanuka forest on the upper slopes and mixed indigenous and exotic vegetation on the lower slopes. These plant communities are described separately below. Naturalized (exotic) species are indicated with an asterisk*.

Upper Slope Forest:

The canopy of the forest on the upper slopes is dominated by tall kanuka with a couple of emergent radiata pine* trees. Other canopy species present are matipo, wineberry, five-finger, lemonwood, lancewood, broadleaf, cabbage tree, native jasmine and pohuehue.

The forest understorey is variously dominated by matipo or small-leaved *Coprosma* species, notably *Coprosma crassifolia*. Other understorey species present are *Coprosma rhamnoides*, *Coprosma propinqua*, *Coprosma rotundifolia*, *Coprosma tayloriae*, *Coprosma robusta* X *propinqua*, five-finger, lemonwood, mahoe, mapou, cabbage tree, lancewood, poroporo, bush lawyer, *Calystegia tuguriorum*, *Clematis marata*, pohuehue and blackberry*. Rarely present are poataniwha and plum*.

Ground-cover species present are necklace fern, hen and chickens fern, *Asplenium hookerianum*, hound's tongue fern, common shield fern, bidibid, hairy pennywort, moss, foxglove* and seedlings of matipo, five-finger, cabbage tree, mahoe and kowhai. Rarely present are male fern* and seedlings of broadleaf.

Species present on the upper forest margin and in forest openings are mahoe, koromiko, *Hypolepis ambigua*, scrub pohuehue, gorse*, broom*, blackberry*, sweet brier* and rarely matagouri and *Parsonsia capsularis*.

A more open (grazed) form of this kanuka forest is present at the western (up-valley) end of the area. Additional species recorded here are weeping mapou, elderberry* and lawyer.

Lower Slope Vegetation:

Vegetation on the lower slopes alongside the Kakahu Gorge Track is more variable, with trees emergent over mixed indigenous and exotic scrub or low-stature forest. Large crack willow* trees are present along the river. Tree species present alongside the track are kanuka, five-finger, matipo, broadleaf, fuchsia, wineberry, lemonwood, cabbage tree, kowhai, hawthorn* and plum*.

Shrub species present are matipo, mahoe, *Coprosma crassifolia*, *Coprosma propinqua*, *Coprosma rhamnoides*, native broom and mountain akeake.

Ground-cover species present are common shield fern, prickly shield fern, hanging spleenwort, hen and chickens fern, necklace fern, *Blechnum fluviatile*, kiokio, hound's tongue fern, bush lily, bidibid, *Carex forsteri*, hookgrass, *Hydrocotyle heteromeria*, wall lettuce* and nettle*.

Species present in open areas are fuchsia, pohuehue, Himalayan honeysuckle*, tutsan*, blackberry*, gorse*, broom*, gooseberry*, bittersweet*, spindle tree*, koromiko, bracken, *Clematis foetida*, *Clematis marata*, *Hypolepis ambigua* and male fern*.

Additional species present on rock outcrops are *Asplenium trichomanes*, *Asplenium lyallii*, *Blechnum chambersii* and stonecrop*.

Birds/Fauna Observed:

Native birds observed during this survey were kereru (several individuals), bellbird, grey warbler, rifleman and fantail (black morph).

Notable Flora, Fauna and Habitats:

Important features of this area are the presence of locally uncommon plant species (*Asplenium trichomanes*, kiokio and native broom), the presence of an 'at risk' bird species (rifleman), the habitat the area provides for forest birds including kereru and the contribution the area makes to fauna habitat in the wider area.

Notable Plant and Animal Pests:

A number of plant pests are present. The most important of these are hawthorn, plum, spindle tree and crack willow. Animal pests were not surveyed.

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

This area is well protected by its location on the steep slopes of the river gorge. It is securely fenced and ungrazed (except for a small western section). It lies close to other areas of indigenous vegetation and provides a corridor of habitat along the river.

Condition and Management Issues:

The upper slope forest is in good condition. The vegetation alongside the river and track is more modified, though still supports a diverse range of indigenous plant species, including locally-uncommon species. Plant and animal pest control are probably the most important management issues.

Property Owner Comment:

Concerned that the ecological values of this area are not over-rated; it is quite modified, especially on the lower slopes alongside the track.

ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

Primary Criteria	Rank	Notes
Representativeness	M	A good example of regenerating indigenous forest, typical of the ecological district.
Rarity	M	Supports several locally-uncommon plant species. Provides habitat for an 'at risk' bird species. May provide habitat for long-tailed bat (nationally-endangered).
Diversity and pattern	M	A good range of plant species is present.
Distinctiveness/special features	M	The track through this area has historic and recreational significance.
Other Criteria		
Size/shape	M/H	A moderate-sized area that is well buffered.
Connectivity	M	Makes an important contribution to fauna habitat in the area. Forms a corridor of vegetation along the river.
Long-term Sustainability	M/H	Some plant and 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):

This area is protected by a QEII Open Space Covenant.

Discussion:

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

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)	
bidibid	<i>Acaena</i> sp.
bittersweet*	<i>Solanum dulcamara</i>
blackberry*	<i>Rubus fruticosus</i>
black nightshade*	<i>Solanum nigrum</i>
blue tussock	<i>Poa colensoi</i>
bog rush	<i>Schoenus pauciflorus</i>
bracken	<i>Pteridium esculentum</i>
broadleaf	<i>Griselinia littoralis</i>
broom*	<i>Cytisus scoparius</i>
bush lawyer	<i>Rubus cissoides</i>
bush lily	<i>Astelia</i> sp.
cabbage tree/ti rakau	<i>Cordyline australis</i>
Chilean flame creeper*	<i>Tropaeolum speciosum</i>
cocksfoot*	<i>Dactylis glomerata</i>
common shield fern	<i>Polystichum richardii</i>
crack willow*	<i>Salix fragilis</i>
crown fern	<i>Blechnum discolor</i>
Douglas fir/oregon*	<i>Pseudotsuga menziesii</i>
elderberry*	<i>Sambucus nigra</i>
five-finger	<i>Pseudopanax arboreus</i>
flax	<i>Phormium tenax</i>
foxglove*	<i>Digitalis purpurea</i>
fuchsia	<i>Fuchsia excorticata</i>
gooseberry*	<i>Ribes uva-crispa</i>
gorse*	<i>Ulex europaeus</i>
hairy pennywort	<i>Hydrocotyle moschata</i>
hanging spleenwort	<i>Asplenium flaccidum</i>
hard fern	<i>Paesia scaberula</i>
hawthorn*	<i>Crataegus monogyna</i>
hen and chickens fern	<i>Asplenium bulbiferum</i>
Himalayan honeysuckle*	<i>Leycesteria formosa</i>
hookgrass	<i>Uncinia</i> sp.
horehound*	<i>Marrubium vulgare</i>
horopito/pepperwood	<i>Pseudowintera colorata</i>
hound's tongue fern	<i>Microsorium pustulatum</i>
ivy*	<i>Hedera helix</i>
kahikatea/white pine	<i>Dacrycarpus dacrydioides</i>
kanuka	<i>Kunzea ericoides</i>
kiokio	<i>Blechnum novae-zelandiae</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>
lemonwood	<i>Pittosporum eugeniioides</i>
lotus*	<i>Lotus pedunculatus</i>
lowland ribbonwood	<i>Plagianthus regius</i>
mahoe/whiteywood	<i>Melicytus ramiflorus</i>
maidenhair fern	<i>Adiantum cunninghamii</i>
male fern*	<i>Dryopteris filix-mas</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 kiokio	<i>Blechnum montanum</i>
narrow-leaved lacebark	<i>Hoheria angustifolia</i>
native broom	<i>Carmichaelia</i> aff. <i>australis</i>
native jasmine	<i>Parsonsia</i> sp.
necklace fern	<i>Asplenium flabellifolium</i>
nettle*	<i>Urtica</i> sp.
old man's beard*	<i>Clematis vitalba</i>
pate	<i>Schefflera digitata</i>
pennywort	<i>Hydrocotyle</i> sp.
periwinkle*	<i>Vinca major</i>
plum*	<i>Prunus</i> sp.
poataniwha	<i>Melicope simplex</i>
pohuehue	<i>Muehlenbeckia australis</i>
pokaka	<i>Elaeocarpus hookerianus</i>
pomaderris*	<i>Pomaderris apetala</i>
poroporo	<i>Solanum laciniatum</i>
prickly shield fern	<i>Polystichum vestitum</i>
pukio	<i>Carex secta</i>
radiata pine*	<i>Pinus radiata</i>
raupo	<i>Typha orientalis</i>
rautahi	<i>Carex coriacea</i>
rohutu	<i>Lophomyrtus obcordata</i>
scrub pohuehue	<i>Muehlenbeckia complexa</i>
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>
spindle tree*	<i>Euonymus europaeus</i>
stonecrop*	<i>Sedum acre</i>
sweet brier*	<i>Rosa rubiginosa</i>
toetoe	<i>Cortaderia richardii</i>
totara	<i>Podocarpus totara</i>
turepo	<i>Sireblus heterophyllus</i>
tutsan*	<i>Hypericum androsaemum</i>
wall lettuce*	<i>Mycelis muralis</i>
water cress*	<i>Rorippa</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>