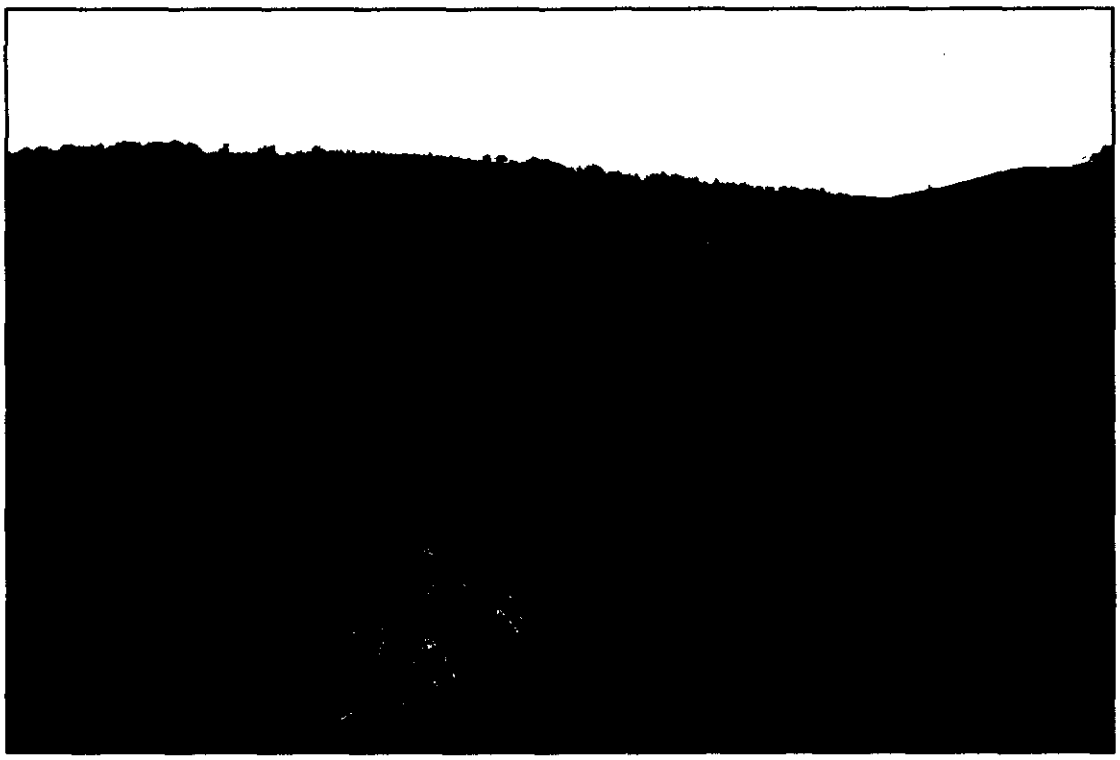
# TIMARU DISTRICT

# SIGNIFICANT NATURAL AREAS SURVEY

## KAKAHU FARM
## GAH & MS HARGREAVES



**Report prepared for Timaru District Council by Mike Harding**
**July 2009**

DRAFT

# TIMARU DISTRICT SIGNIFICANT NATURAL AREAS SURVEY

# PROPERTY REPORT

## PROPERTY DETAILS:

**Owner:** ..... GAH and MS Hargreaves
**Valuation References:** .... 24670/117.00; 24670/124.00; 24670/125.00; 24670/125.03; 24670/179.00; 24670/181.00; 24670/182.00; 24670/218.00; 24670/219.00
**Address:** ..... Winchester-Hanging Rock Road, Kakahu Bush
**Location:** ..... Rolling hill country between Winchester Hanging Rock Road, Hall Road and Geraldine-Fairlie Highway
**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 rolling hill country in the Kakahu-Gapes Valley area in South Canterbury, comprising loess-covered limestone 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 limestone 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 limestone 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 mixed hardwood forest, podocarp-hardwood forest, kanuka forest, shrubland, limestone bluff vegetation and small wetlands. The property lies close to protected areas of indigenous forest at Kakahu Bush and 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 2009. Nearly all parts of the property were visited and assessed. Twenty-five discrete areas, totalling approximately ?? 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 |
|---|---|---|---|---|
| 163a | Kakahu Farm Gully Wetlands | J38: 598-740 | ? | sedgeland; rushland; shrubland |
| 163b | Kakahu Farm Gully Wetlands | J38: 600-740 | ? | sedgeland; rushland; shrubland |
| 163c | Kakahu Farm Gully Wetlands | J38: 598-742 | ? | sedgeland; rushland; shrubland |
| 164d | Rocky Ridges | J38: 590-739 | ? | hardwood forest on limestone |
| 167a | | J38: 582-732 | ? | hardwood forest on limestone |
| 167b | | J38: 584-738 | ? | hardwood forest on limestone |
| 167c | | J38: 585-735 | ? | hardwood forest on limestone |
| 167d | | J38: 584-735 | ? | shrubland; tussockland |
| 169 | Kakahu Coal Mine | J38: 567-727 | ? | podocarp-hardwood forest |
| 170b | | J38: 577-715 | ? | podocarp-hardwood forest |
| 170c | | J38: 578-723 | ? | podocarp-hardwood forest |
| 171a | | J38: 576-730 | ? | kanuka forest |
| 171b | | J38: 576-725 | ? | kanuka forest |
| 173a | Hall Valley Wetlands | J38: 573-714 | ? | sedgeland; rushland |
| 174a | | J38: 580-720 | ? | hardwood forest on limestone |
| 176a | | J38: 582-727 | ? | hardwood forest on limestone |
| 176b | | J38: 582-727 | ? | hardwood forest on limestone |
| 183a | Kakahu River Scarp | J38: 605-728 | ? | hardwood forest |
| 184a | | J38: 589-735 | ? | hardwood forest on limestone |
| 184b | | J38: 592-733 | ? | hardwood forest on limestone |
| 184c | | J38: 593-730 | ? | hardwood forest on limestone |
| 184d | | J38: 592-731 | ? | hardwood forest on limestone |
| 184g | Ravensdown Ridge Remnants | J38: 597-724 | ? | hardwood forest on limestone |
| 184h | Ravensdown Ridge Remnants | J38: 600-722 | ? | hardwood forest on limestone |
| 229b | Fletcher Road Scarp Forest | J38: 610-699 | ? | podocarp-hardwood forest |



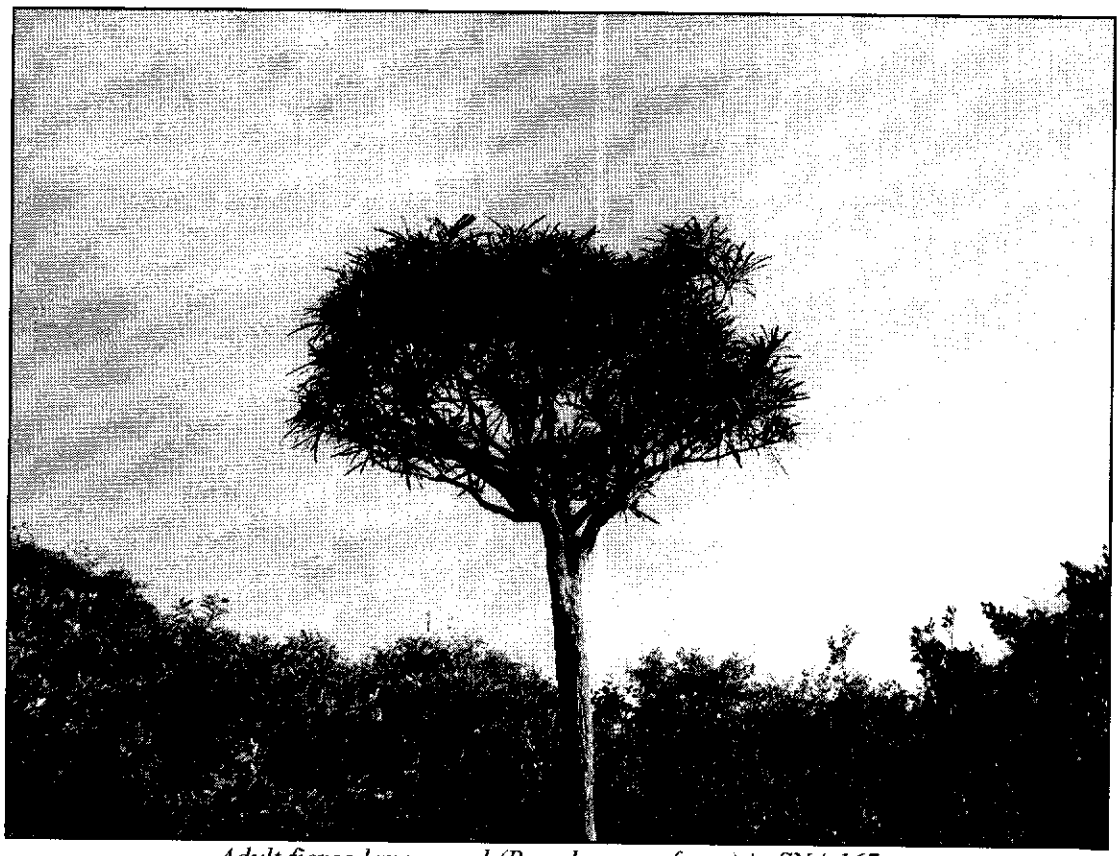
These SNAs are illustrated on the attached aerial photographs and described in greater detail on the Area Inspection Forms in this report. Note that the boundaries of the SNAs are indicative, rather than precise. These areas meet the ecological criteria in the Timaru District Plan (criteria i-vi, pages 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 to 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.

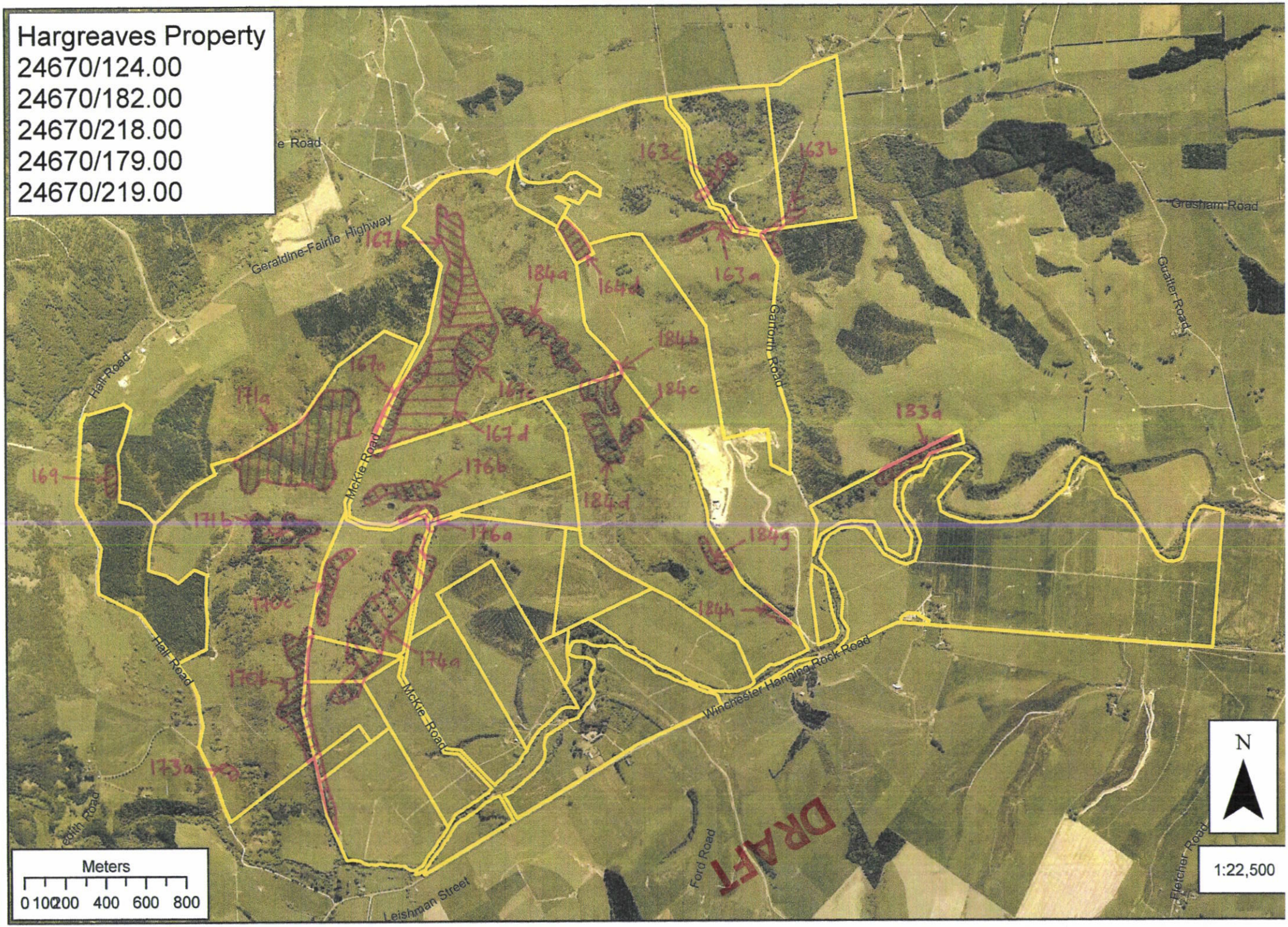
## OTHER AREAS INSPECTED ON THE PROPERTY:

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. 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.

Other areas of indigenous vegetation on the property include quite large areas of tussockland, shrubland and low-stature or scattered regenerating forest. These areas, especially areas that link areas of forest, are important for nature conservation but in most cases do not quite meet the District Plan criteria. If assessed again in a few years time, following further regeneration of indigenous species, these areas probably would meet the criteria.



*Adult fierce lancewood (Pseudopanax ferox) in SNA 167a*


Hargreaves Property
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Mckie Road
Carrothy Road
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Winchester Hanging Rock Road
Ford Road
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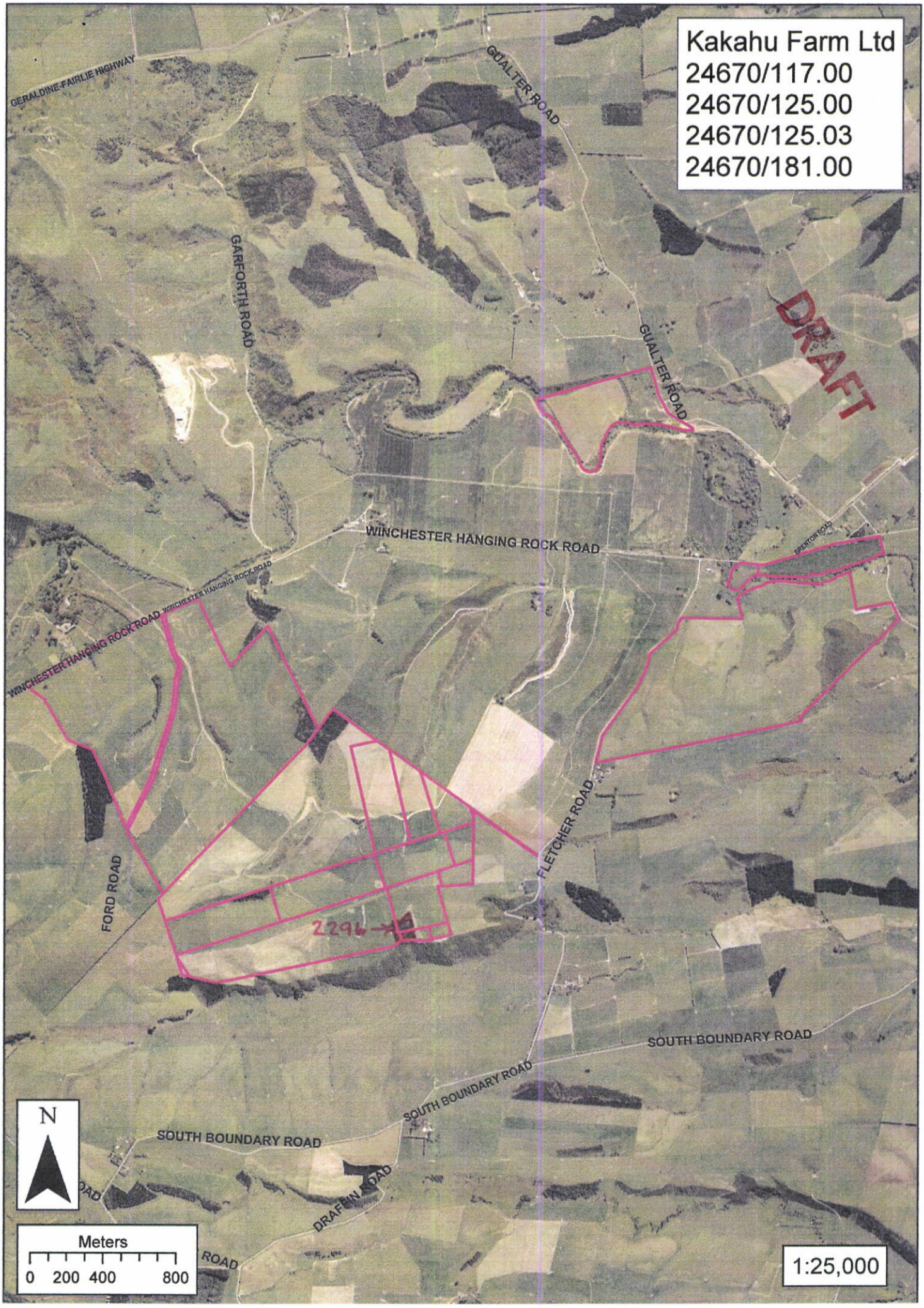
Kakahu Farm Ltd
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# TIMARU DISTRICT SNA SURVEY AREA 163a, b and c

| | | |
|---|---|---|
| **Area Name:** Kakahu Farm Gully Wetlands | **Property:** Gerald Hargreaves | |
| **Ecological District:** Geraldine | **Nearest Locality:** Gapes Valley | |
| **AREA 163a: Location** (central map ref.): J38: 598-740 | **Area Size (ha):** ? | **Altitude (m):** 100 |
| **AREA 163b: Location** (central map ref.): J38: 600-740 | **Area Size (ha):** ? | **Altitude (m):** 110 |
| **AREA 163c: Location** (central map ref.): J38: 598-742 | **Area Size (ha):** ? | **Altitude (m):** 120 |
| **Surveyors:** Mike Harding | **Survey Time:** 1 hour | **Survey Date:** 21-05-09 |

## General Description:

This SNA comprises three separate, though hydrologically-connected, areas of wetland vegetation in tributaries of the main gully east of Rocky Ridges. These areas of wetland are separated by areas of pasture with scattered shrubs.

## Plant Communities:

The main plant communities are present are sedgeland, rushland and shrubland. These plant communities are described below for each SNA. Naturalized (exotic) species are indicated with an asterisk*.

SNA 163a:

Most parts of this wetland are dominated by pukio (*Carex secta*). Dominant species at other parts of the wetland are *Juncus gregiflorus*, rautahi (*Carex coriacea*) and pasture grasses, notably cocksfoot*. Other species present are *Coprosma propinqua*, matagouri, gorse*, *Blechnum penna-marina*, buttercup* (*Ranunculus* sp.), foxglove* and crack willow*.

SNA 163b:

This wetland is dominated by rautahi, *Juncus gregiflorus* and Yorkshire fog*. Gorse* is also dominant in places on the margin. Other species present are soft rush*, *Coprosma tayloriae*, *Coprosma propinqua*, lotus*, Californian thistle* and fescue tussock. Additional species present at the wetland margin are hawthorn*, cabbage tree, broom* and elderberry*. The cabbage trees have trunk diameters (at breast height) between 45 and 50 cm and have cavities that provide suitable roost sites for birds and possibly bats.

SNA 163c:

This wetland is dominated by pukio. Other species present are cabbage tree, kanuka, gorse* and hawthorn*.

## Birds/Fauna Observed:

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

## Notable Flora, Fauna and Habitats:

Important features of this area are the presence of wetland vegetation, the size and inter-connectedness of the wetlands and the presence of an 'at risk' bird species (rifleman). Low-altitude wetlands are nationally-rare ecosystems.

## Notable Plant and Animal Pests:

Crack willow, hawthorn and gorse are the main woody plant pests present. Soft rush, pasture grasses and thistles are also present and in places dominant. Animal pests were not surveyed.

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

These three areas are protected to some extent by the depth of the wetlands and, in places, by riparian shrubland. However they are vulnerable to developments such as draining or damming. While each area of wetland is moderate in size, they are connected by streams and together form a relatively large area of wetland habitat. Surrounding vegetation is mostly pasture and shrubland.

## Condition and Management Issues:

Protection of the wet areas from drainage or inundation is the main management issue. Other important issues are containment of introduced plants and protection of wetland vegetation from intensive grazing.

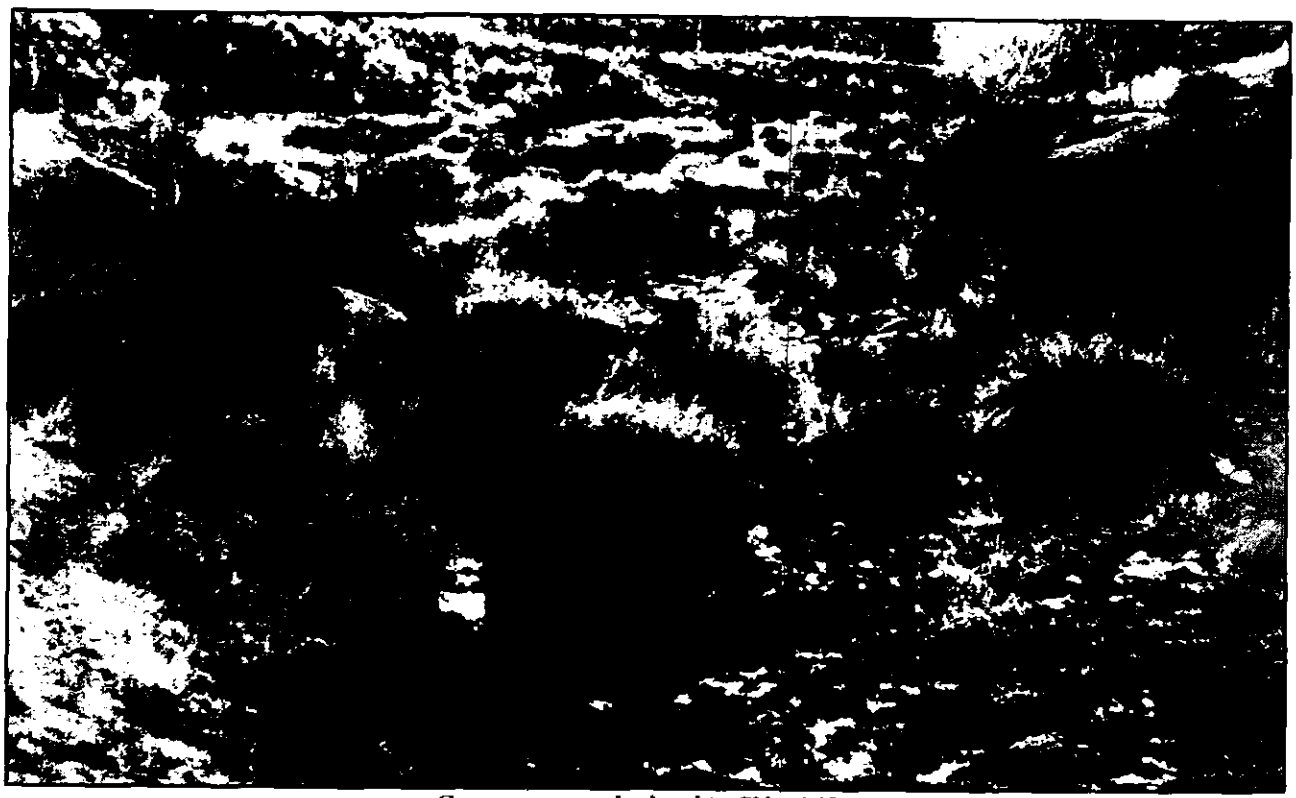
**Property Owner Comment:**

## ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

| Primary Criteria | Rank | Notes |
|---|---|---|
| Representativeness | M | The plant communities are typical of wetlands in the ecological district. |
| Rarity | M | No rare plant species are present. The wetlands and wetland margin vegetation provides habitat for an 'at risk' species (rifleman) and possibly habitat for long-tailed bat (a 'nationally-endangered' species). Lowland wetlands are a nationally-rare ecosystem type. |
| Diversity and pattern | L/M | Several plant communities are present but species diversity is substantially reduced. |
| Distinctiveness/special features | M | The presence of three interconnected areas of wetland vegetation is a special feature. |
| **Other Criteria** | | |
| Size/shape | M | Moderate-sized wetlands. |
| Connectivity | M | The wetlands are connected by streams and narower strips of wetland vegetation and shrubland. |
| Long-term Sustainability | L/M | Protection of the wetlands from drainage, intensive grazing and plant pests will be required to maintain their ecological values in the long term. |

**Final Consideration (of other matters: Section D, page B-19 of Timaru District Plan):**
These areas are protected by the wetness of the substrate. They have some potential for farm development, though also provide a useful stock-water source.

**Discussion:**
These areas meet the District Plan criteria for Significant Natural Areas. Important features of these areas are the presence of wetland vegetation, the size and inter-connectedness of the wetlands and the presence of an 'at risk' bird species (rifleman). Low-altitude wetlands are nationally-rare ecosystems.



*Carex secta sedgeland in SNA 163a*

# TIMARU DISTRICT SNA SURVEY Wetland 163
# Wetland Record Form

| | |
|---|---|
| **Wetland name:** Kakahu Farm Gully Wetlands | **Date:** 21 May 2009 |
| **Property:** Kakahu Farm (Gerald Hargreaves) | **GPS/Grid Ref:** J38: 599-741 |
| **Altitude:** 100 to 120 m | **No. of plots sampled:** |
| **Location:** In gully head south of Geraldine-Fairlie Highway near Rocky Ridges | **Approximate size (ha):** |

| Classification: I System | IA Subsystem | II Wetland Class | IIA Wetland Form |
|---|---|---|---|
| Riverine | Permanent | Swamp | Riparian |

**Surveyors:** Mike Harding

| Indicator | Indicator components | Specify and Comment | Score 0-5[1] | Mean score |
|---|---|---|---|---|
| Change in hydrological integrity | Impact of manmade structures | Small dams/culvert present | 4 | 3.67 |
| | Water table depth | Altered locally | 4 | |
| | Dryland plant invasion | Pasture grasses present | 3 | |
| Change in physico-chemical parameters | Fire damage | No evidence of damage | 5 | 4 |
| | Degree of sedimentation/erosion | Some stock trampling | 4 | |
| | Nutrient levels | Dung present | 3 | |
| | von Post index | | | |
| Change in ecosystem intactness | Loss in area of original wetland | Some loss likely | 4 | 4 |
| | Connectivity barriers | Small vehicle-track barriers | 4 | |
| Change in browsing, predation and harvesting regimes | Damage by domestic or feral animals | Browsing and trampling over >50% of wetland | 2 | 3.33 |
| | Introduced predator impacts on wildlife | Unclear | 3 | |
| | Harvesting levels | None apparent | 5 | |
| Change in dominance of native plants | Introduced plant canopy cover | Crack willow in places | 4 | 3.5 |
| | Introduced plant understorey cover | Dominant in places | 3 | |
| **Total wetland condition index /25** | | | | **18.5** |

**Main vegetation types:** *Carex secta* sedgeland; *Juncus gregiflorus* rushland, crack willow forest

**Native fauna:** Fantail, grey warbler and rifleman in willows and adjacent shrubland.

**Other comments:** Three main areas of wetland linked hydrologically along stream channels.

| Pressure | Rating[2] | Specify and Comment |
|---|---|---|
| Modifications to catchment hydrology | 1 | Small dams and vehicle crossings |
| Water quality within the catchment | 3 | Small catchment grazed by cattle and sheep. |
| Animal access | 4 | Little impediment to animal access |
| Key undesirable species | 2 | Crack willow and gorse |
| % catchment in introduced vegetation | 4 | Most of catchment |
| Other pressures | 1 | Fertiliser drift? |
| **Total wetland pressure index /30** | **15** | |

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 164d

**Area Name:** Rocky Ridges
**Location (central map reference):** J38: 590-739
**Ecological District:** Geraldine
**Surveyors:** Mike Harding
**Property:** Gerald Hargreaves
**Nearest Locality:** Gapes Valley
**Area Size (ha):** ?
**Altitude (m):** 250-285
**Survey Time:** 1 hour
**Survey Date:** 18-05-09

## General Description:
This SNA comprises the central part of a strip of indigenous forest on the prominent limestone ridge just south of the Rocky Ridges property.

## Plant Communities:
Indigenous hardwood forest is the main plant community present. This is described in detail below. Naturalized (exotic) species are indicated with an asterisk*.

The forest canopy is dominated by broadleaf, mahoe, matipo, mapou and pohuehue. Other canopy and sub-canopy species present are cabbage tree, five-finger, wineberry, mountain akeake, barberry*, hawthorn* and old man's beard*. Also present are isolated trees of plum*, holly*, European privet* and a single deciduous (oak?) tree.

The forest understorey is in most places open and depleted. Understorey species present, mostly at rocky sites protected from grazing, are *Coprosma propinqua*, mapou, five-finger, barberry*, leafless lawyer, poroporo, black nightshade* and rarely *Clematis marata* and poataniwha.

Ground-cover species present are *Blechnum chambersii*, *Asplenium lyallii*, *Pellaea rotundifolia*, common shield fern, hound's tongue fern, maidenhair fern, *Epilobium nummulariifolium*, *Leptinella* sp., cranesbill*, toatoa, pennywort and seedlings of *Coprosma propinqua* and barberry*.

Species commonly present in forest openings and at the forest margins are *Coprosma propinqua*, leafless lawyer, barberry*, Khasia berry*, native broom, matagouri, *Calystegia tuguriorum*, *Parsonsia capsularis*, old man's beard*, pohuehue, scrub pohuehue and *Clematis foetida*. Species occasionally present are mistletoe (on *Coprosma propinqua*), gooseberry*, koromiko, stonecrop*, horehound* and silver tussock.

## Birds/Fauna Observed:
Native birds observed during this brief survey were grey warbler, bellbird and rifleman.

## Notable Flora, Fauna and Habitats:
Important features of this area are the occurrence of indigenous woody vegetation on a limestone substrate, the habitat the area provides for forest birds including rifleman (an 'at risk' species), the proximity of the area to other patches of indigenous woody vegetation and the spectacular nature of the limestone pavement.

## Notable Plant and Animal Pests:
Several important plant pests are present, notably old man's beard and barberry. Barberry is present throughout the area and old man's beard is relatively common, posing a significant threat to the indigenous vegetation and compromising the ecological integrity of the area. Other important plant pests are hawthorn, European privet, Khasia berry, holly and plum. Animal pests were not surveyed.

## Boundaries (buffering, fencing, adjoining plant communities and habitats):
This area is part of a larger strip of forest, parts of which lie on two adjacent properties. It is narrow but well buffered by its location on steeply sloping limestone pavement. Other areas of indigenous vegetation are present nearby.

## Condition and Management Issues:
Containment or control of woody plant pests is the most important management issue. Encouragement of understorey regeneration is also important.

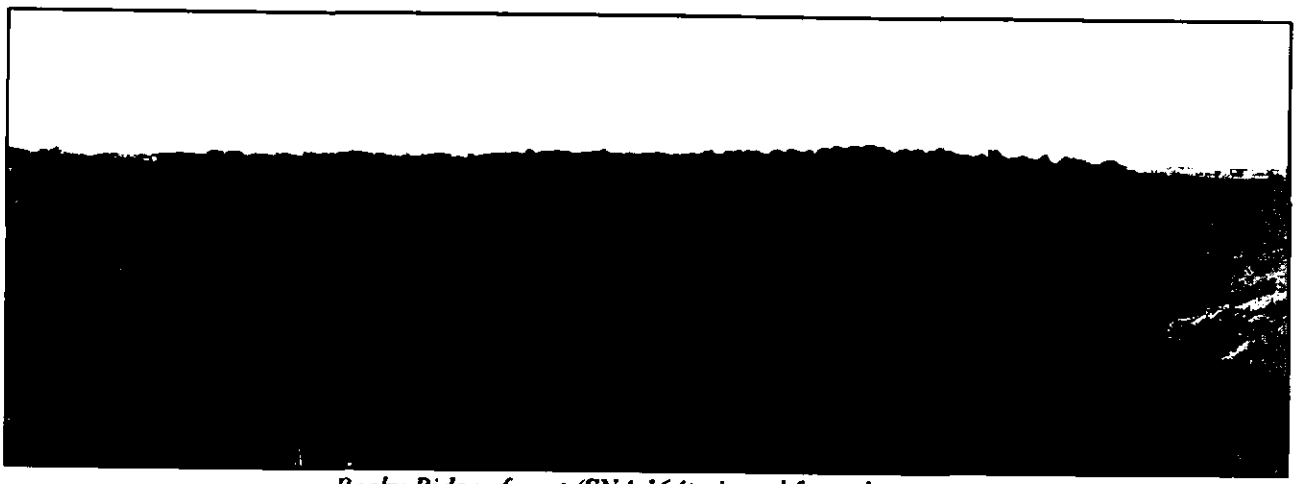
**Property Owner Comment:**

## ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

| Primary Criteria | Rank | Notes |
|---|---|---|
| Representativeness | M | A good example of indigenous vegetation typical of such sites in the ecological district. |
| Rarity | M | Provides habitat for an 'at risk' bird species (rifleman). Indigenous vegetation on limestone is a nationally-rare vegetation type. |
| Diversity and pattern | L/M | Species diversity is substantially reduced. |
| Distinctiveness/special features | M/H | The sloping limestone pavement is a spectacular feature. |
| **Other Criteria** | | |
| Size/shape | M | A small to moderate-sized area that is well buffered. |
| Connectivity | M | Part of a larger area of vegetation and lies close to other areas of indigenous vegetation. |
| Long-term Sustainability | L | The ecological integrity of the area is seriously threatened by woody weeds. |

**Final Consideration (of other matters: Section D, page B-19 of Timaru District Plan):**
This area is protected by its location on steeply-sloping limestone. It has very 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 occurrence of indigenous woody vegetation on a limestone substrate, the habitat the area provides for forest birds including rifleman (an 'at risk' species), the proximity of the area to other patches of indigenous woody vegetation and the spectacular nature of the limestone pavement.



*Rocky Ridges forest (SNA 164) viewed from the west*

# TIMARU DISTRICT SNA SURVEY AREA 167a

**Area Name:**
**Location (central map reference):** J38: 582-732
**Ecological District:** Geraldine
**Surveyors:** Mike Harding

**Property:** Gerald Hargreaves
**Nearest Locality:** Kakahu Bush
**Area Size (ha):** ? **Altitude (m):** 260-280
**Survey Time:** 1 hour **Survey Date:** 15-05-09

## General Description:

This SNA is a long narrow strip of hardwood forest on an exposed limestone ridge. It lies north of SNA 170c, west of SNA 167d and east of SNA 171a.

## Plant Communities:

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

Hardwood forest:
This plant community occupies the exposed ridge crest, on a substrate of limestone pavement and boulders. The forest canopy is dominated by mahoe and broadleaf. Other canopy or sub-canopy species present are cabbage tree, hawthorn*, matipo, mapou, five-finger, turepo, wineberry, *Parsonsia capsularis* and pohuehue. A single tree of the threatened ('gradual decline') fierce lancewood (*Pseudopanax ferox*) is present at map reference 2358194-5673313.

The forest understorey and ground-cover are very sparse and open. Species present are *Coprosma propinqua*, hawthorn*, black nightshade*, bittersweet*, bush lily, prickly shield fern, common shield fern, *Pellaea rotundifolia* and pennywort.

Other species, generally confined to limestone rock, are hound's tongue fern, *Blechnum chambersii*, *Asplenium lyallii*, *Leptinella* sp. and *Epilobium nummulariifolium*.

Shrubland:
This plant community forms a mostly narrow strip of scattered woody vegetation along the margins of the taller forest. It is dominated by *Coprosma propinqua*, leafless lawyer and pohuehue. Other species present are silver tussock, mistletoe (on *Coprosma propinqua*), native broom, scrambling fuchsia, *Parsonsia capsularis*, *Calystegia tuguriorum*, scrub pohuehue, nodding thistle* and horehound*.

## Birds/Fauna Observed:

Very strong winds limited the effectiveness of bird observations. However, bellbird, brown creeper, fantail, harrier and rifleman were observed during this brief survey.

## Notable Flora, Fauna and Habitats:

Important features of this area are the occurrence of indigenous woody vegetation on a limestone substrate, the presence of a threatened plant species (*Pseudopanax ferox*), the habitat the forest provides for birds including rifleman (an 'at risk' species), the presence of locally-uncommon plant species (bush lily and turepo) and the proximity of the area to other areas of indigenous vegetation. The limestone substrate forms an impressive pavement with deep fissures; an unusual landform.

## Notable Plant and Animal Pests:

Hawthorn is the main introduced plant pest in the area. The native climber, pohuehue, poses a threat to indigenous trees and shrubs, especially those on the forest margin. Some herbaceous weeds, notably horehound and thistles, pose some threat to forest margin communities. Animal pests were not surveyed.

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

This SNA is buffered to some extent by its location on an exposed limestone ridge, which has presumably protected the vegetation from previous disturbance. However, the area is long and narrow. It is connected to SNAs (SNA 171a and SNA 176) by shrubland (SNA 167d) and is part of a network of scattered patches of indigenous vegetation in the area.

**Condition and Management Issues:**
The forest canopy is in reasonably good condition. The forest understorey is relatively open and depleted. The main management issue is encouragement of understorey regeneration and removal of hawthorn.

**Property Owner Comment:**

## ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

| Primary Criteria | Rank | Notes |
|---|---|---|
| Representativeness | M | A good example of hardwood forest typical of the ecological district. |
| Rarity | M/H | Provides habitat for a 'gradual decline' plant species (fierce lancewood) and an 'at risk' bird species (rifleman). Indigenous vegetation on limestone is a nationally-rare vegetation type. |
| Diversity and pattern | L/M | Species diversity is low. |
| Distinctiveness/special features | M | The limestone substrate (pavement) is a special feature. |
| **Other Criteria** | | |
| Size/shape | M | A moderate-sized area but with a narrow shape and not well buffered. |
| Connectivity | M | An important part of a network of fauna habitat in the area. |
| Long-term Sustainability | M | Encouragement of understorey vegetation may be required to maintain the ecological values of the area in the long term. |

**Final Consideration (of other matters: Section D, page B-19 of Timaru District Plan):**
This area is protected by its location on an exposed limestone ridge, limiting 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 occurrence of indigenous woody vegetation on a limestone substrate, the presence of a threatened plant species (*Pseudopanax ferox*), the habitat the forest provides for birds including rifleman (an 'at risk' species), the presence of locally-uncommon plant species and the proximity of the area to other areas of indigenous vegetation. The limestone substrate forms an impressive pavement with deep fissures; an unusual landform.

# TIMARU DISTRICT SNA SURVEY AREA 167b

**Area Name:**
**Property:** Gerald Hargreaves
**Location (central map reference):** J38: 584-738
**Nearest Locality:** Kakahu Bush
**Ecological District:** Geraldine
**Area Size (ha):** ?
**Altitude (m):** 260-290
**Surveyors:** Mike Harding
**Survey Time:** 1 hour
**Survey Date:** 18-05-09

## General Description:

This SNA is a long strip of hardwood forest on a limestone ridge. It lies north of SNA 167a and northwest of SNA 167c.

## Plant Communities:

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

Hardwood forest:

This plant community occupies the ridge crest and the adjacent steeply-sloping limestone pavement. The forest canopy is dominated by mahoe and broadleaf. Other canopy or sub-canopy species present are cabbage tree, five-finger, fuchsia, wineberry, mapou and pohuehue. A single small holly* tree, with a trunk diameter of 16 cm, near the upper forest margin was felled and its cut trunk treated with herbicide gel.

The forest understorey is mostly sparse and open. Species present are *Coprosma propinqua*, leafless lawyer and black nightshade*.

The ground-cover varies. It is relatively bare in some areas and well-vegetated in other areas where the limestone pavement limits stock access. At less accessible areas the rock is covered with moss. Important ground-cover species are common shield fern, *Pellaea rotundifolia*, hound's tongue fern, *Blechnum chambersii*, *Asplenium lyallii* and maidenhair fern. Other ground-cover species present are pennywort, hairy pennywort, bidibid, *Clematis marata*, *Galium* sp., cranesbill*, *Cardamine* sp. and seedlings of mapou, mahoe, *Coprosma propinqua* and pohuehue.

Shrubland:

This plant community forms a mostly narrow strip of scattered woody vegetation along the upper margin of the taller forest and a more extensive area at the lower margin, which grades to SNA 167d. It is dominated by *Coprosma propinqua*, leafless lawyer and pohuehue. Other species present are silver tussock, native broom, barberry*, hawthorn*, sweet brier*, gorse*, *Parsonsia capsularis*, *Calystegia tuguriorum*, scrub pohuehue, *Pellaea rotundifolia*, common shield fern, foxglove*. One patch of old man's beard* is present at the lower margin.

## Birds/Fauna Observed:

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

## Notable Flora, Fauna and Habitats:

Important features of this area are the occurrence of indigenous woody vegetation on a limestone substrate, the habitat the forest provides for birds including rifleman (an 'at risk' species), the diversity (in places) of the ground-cover vegetation and the proximity of the area to other areas of indigenous vegetation. The limestone substrate forms an extensive sloping pavement with fissures.

## Notable Plant and Animal Pests:

Important introduced plant pests observed in the area are old man's beard, hawthorn, barberry and holly. Only one holly tree was observed. This tree was removed. Old man's beard and barberry both pose a significant threat to indigenous vegetation in the SNA. The native climber, pohuehue, poses a threat to indigenous trees and shrubs on the forest margin. Animal pests were not surveyed.

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

This SNA is buffered to some extent by its location on a raised limestone pavement, which has presumably protected the vegetation from disturbance. However, the area is long and narrow. It is connected to other

areas of indigenous forest (SNA 167a and SNA 167c) by relatively dense indigenous shrubland (SNA 167d) and is part of a network of scattered areas of indigenous vegetation in the area.

**Condition and Management Issues:**
The forest canopy is in reasonably good condition. The forest understorey is mostly open and depleted. The ground-cover varies though is, in places, quite diverse. The main management issues are control of invasive introduced plants and the encouragement of understorey regeneration.

**Property Owner Comment:**

## ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

| Primary Criteria | Rank | Notes |
|---|---|---|
| Representativeness | M | A good example of hardwood forest typical of the ecological district. |
| Rarity | M | Provides habitat for an 'at risk' bird species (rifleman). Indigenous vegetation on limestone is a nationally-rare vegetation type. |
| Diversity and pattern | M | Species diversity is in places relatively good. |
| Distinctiveness/special features | M | The limestone substrate (pavement) is a special feature. |
| **Other Criteria** | | |
| Size/shape | M | A moderate-sized area but with a narrow shape. |
| Connectivity | M | Part of a network of fauna habitat in the area. |
| Long-term Sustainability | M | Weed control and encouragement of understorey vegetation may be required to maintain the ecological values of the area in the long term. |

**Final Consideration (of other matters: Section D, page B-19 of Timaru District Plan):**
This area is protected by its location on an exposed limestone ridge. The limestone outcrops and steepness of the slope limit 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 occurrence of indigenous woody vegetation on a limestone substrate, the habitat the forest provides for birds including rifleman (an 'at risk' species), the diversity (in places) of the ground-cover vegetation and the proximity of the area to other areas of indigenous vegetation. The limestone substrate forms an extensive sloping pavement with fissures.

# TIMARU DISTRICT SNA SURVEY AREA 167c

**Area Name:**
**Location (central map reference):** J38: 585-735
**Ecological District:** Geraldine
**Surveyors:** Mike Harding

**Property:** Gerald Hargreaves
**Nearest Locality:** Kakahu Bush
**Area Size (ha):** ? **Altitude (m):** 170-260
**Survey Time:** ½ hour **Survey Date:** 18-05-09

## General Description:

This SNA comprises an area of hardwood forest, with a single totara tree, on moderately steep east-facing slopes of a limestone ridge. It is linked to two other areas of indigenous forest on limestone at its upper boundary (SNA 167a and SNA 167b) by an area of shrubland (SNA 167d).

## Plant Communities:

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

This plant community occupies an area of sloping limestone pavement near the bottom of the slope. The forest canopy is dominated by mahoe and broadleaf. Other canopy or sub-canopy species present are cabbage tree, mapou and a single young totara tree with a trunk diameter (at breast height) of 36 cm.

The forest understorey is mostly sparse and open. Species present are *Coprosma propinqua*, leafless lawyer, elderberry*, black nightshade*, bittersweet* and (rarely) bush lily.

The ground-cover is generally sparse. Species present are common shield fern, pennywort, *Asplenium lyallii*, *Pellaea rotundifolia*, *Epilobium nummulariifolium*, cranesbill* and seedlings of *Coprosma propinqua*, pohuehue and barberry*.

Other species present on the forest margin are *Calystegia tuguriorum*, native jasmine, *Clematis forsteri* and leafless lawyer.

## Birds/Fauna Observed:

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

## Notable Flora, Fauna and Habitats:

Important features of this area are the occurrence of indigenous woody vegetation on a limestone substrate, the presence of totara, the habitat the area provides for birds including rifleman (an 'at risk' species), the presence of a locally-uncommon plant species (bush lily) and the proximity of the area to other areas of indigenous vegetation.

## Notable Plant and Animal Pests:

Important introduced plant pests observed in the area are hawthorn and barberry. Hawthorn and barberry pose the most significant threat to indigenous vegetation in the SNA. The native climber, pohuehue, poses a threat to indigenous trees and shrubs on the forest margin. Animal pests were not surveyed.

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

This SNA is buffered to some extent by its location on a moderately steep limestone slope. The dense shrubland (SNA 167d) adjacent to the area connects it to other areas of indigenous forest (SNA 167a and SNA 167b). It is part of a network of scattered areas of indigenous vegetation in the area.

## Condition and Management Issues:

The forest canopy is in reasonably good condition. The forest understorey is mostly open and depleted. The main management issues are control of invasive introduced plants and the encouragement of forest and understorey regeneration.

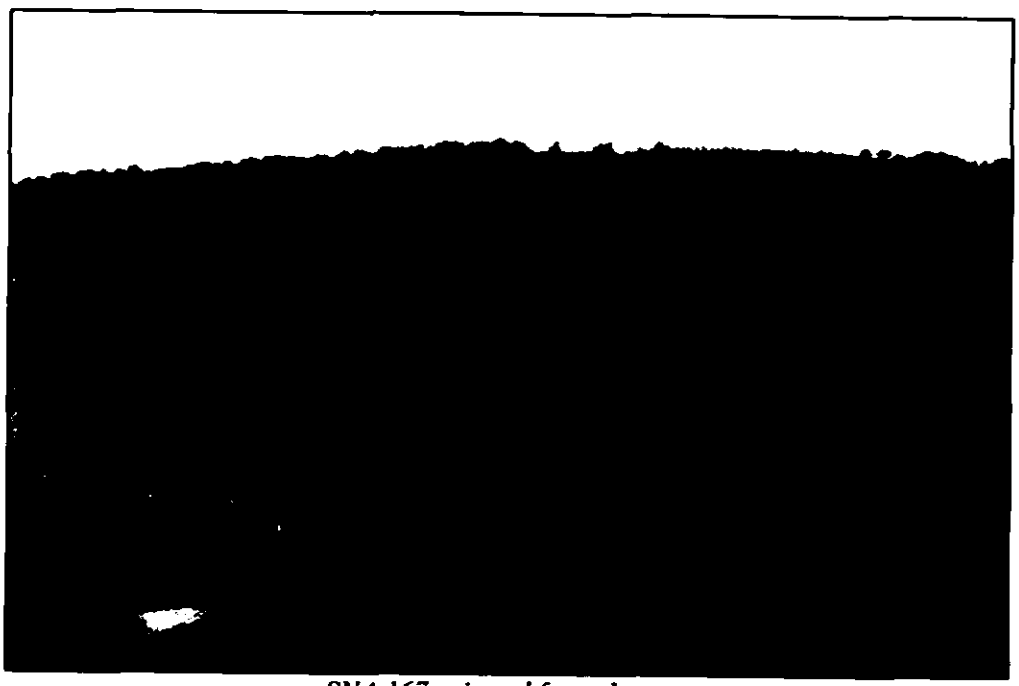
## Property Owner Comment:

## ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

| Primary Criteria | Rank | Notes |
|---|---|---|
| Representativeness | M/H | A good example of hardwood forest typical of the ecological district and containing an emergent species representative of the original vegetation (totara). |
| Rarity | M | Provides habitat for an 'at risk' bird species (rifleman). Indigenous vegetation on limestone is a nationally-rare vegetation type. |
| Diversity and pattern | L/M | Species diversity is substantially reduced. |
| Distinctiveness/special features | L/M | The sloping limestone rock (pavement) and the presence of totara are special features. |
| **Other Criteria** | | |
| Size/shape | M | A small area, but with a good shape and reasonably well buffered. |
| Connectivity | M | Part of a network of fauna habitat in the area. |
| Long-term Sustainability | M | Weed control and encouragement of understorey vegetation may be required to maintain the ecological values of the area in the long term. |

**Final Consideration (of other matters: Section D, page B-19 of Timaru District Plan):**
This area is protected by its location on a steep limestone slope. The limestone rock and steepness of the slope limit 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 occurrence of indigenous woody vegetation on a limestone substrate, the presence of totara, the habitat the area provides for birds including rifleman (an 'at risk' species) and the proximity of the area to other areas of indigenous vegetation.



*SNA 167c viewed from the east*

# TIMARU DISTRICT SNA SURVEY AREA 167d

**Area Name:**
**Property:** Gerald Hargreaves
**Location (central map reference):** J38: 584-735
**Nearest Locality:** Gapes Valley
**Ecological District:** Geraldine
**Area Size (ha):** ?
**Altitude (m):** 170-260
**Surveyors:** Mike Harding
**Survey Time:** ½ hour
**Survey Date:** 18-05-09

## General Description:

This SNA comprises an area of relatively dense indigenous shrubland on moderately steep east-facing slopes of a limestone ridge. It lies between and links the three forested parts of the Area (SNA 167a, SNA 167b and SNA 167c).

## Plant Communities:

The main plant community present is shrubland, dominated by indigenous species. This plant community is described below. Naturalized (exotic) species are indicated with an asterisk*.

This plant community covers a relatively extensive area on the mid-slopes, between patches of indigenous forest. It is dominated by *Coprosma propinqua*, leafless lawyer, pohuehue and intervening areas of open pasture with scattered silver tussock. Other species present are matagouri, matipo, broadleaf, native broom, barberry*, hawthorn*, scrub pohuehue, *Clematis* sp., fescue tussock, patches of gorse*, blackberry*, bittersweet*, foxglove*, horehound*, nodding thistle* and Californian thistle*. One patch of old man's beard* is present at map reference 2358428E-5673467N.

Two small areas of indigenous forest are present on isolated limestone knolls at the lower southeast end of the area. These areas of forest are dominated by mahoe, broadleaf and pohuehue. Other canopy species present are cabbage tree and mapou. The understorey of each forest patch is very open. Species present at the forest margins or on bedrock within the forest are *Coprosma propinqua*, *Coprosma crassifolia*, native broom, barberry*, poroporo, black nightshade*, *Calystegia tuguriorum*, *Parsonsia capsularis*, scrub pohuehue, common shield fern, *Asplenium lyallii*, *Pellaea rotundifolia*, nettle*, silver tussock, nodding thistle*, Scotch thistle* and horehound*.

## Birds/Fauna Observed:

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

## Notable Flora, Fauna and Habitats:

The most important features of this area are the health and diversity of the shrubland community and the link this shrubland provides between three separate areas of indigenous forest. Other features are the presence of indigenous woody vegetation on a limestone substrate and the habitat the area provides for birds including rifleman (an 'at risk' species).

## Notable Plant and Animal Pests:

Important introduced plant pests observed in the area are old man's beard, hawthorn and barberry. Old man's beard and barberry both pose a significant threat to indigenous vegetation in the SNA. The native climber, pohuehue, also poses a threat to isolated indigenous trees and shrubs. Animal pests were not surveyed.

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

This SNA is buffered to some extent by its location on a moderately steep limestone slope. It lies adjacent to and links three areas of indigenous forest (SNA 167a , SNA 167b and SNA 167c). It is part of a network of scattered areas of indigenous vegetation in the area.

## Condition and Management Issues:

The shrubland is in good condition and actively regenerating. The small patches of forest are open and substantially depleted. The main management issues are control of invasive introduced plants and the encouragement of shrubland and forest regeneration.

## Property Owner Comment:

## ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

| Primary Criteria | Rank | Notes |
|---|---|---|
| Representativeness | M | A good example of shrubland typical of regenerating indigenous woody vegetation in the ecological district. |
| Rarity | M | Provides habitat for an 'at risk' bird species (rifleman). Indigenous vegetation on limestone is a nationally-rare vegetation type. |
| Diversity and pattern | L/M | Species diversity is low and reduced from that originally present. |
| Distinctiveness/special features | L/M | The sloping limestone rock (pavement) and the presence of tomos are special features. |
| **Other Criteria** | | |
| Size/shape | M/H | A moderate-sized area with a good shape. |
| Connectivity | M/H | Links three areas of indigenous forest and is part of a network of fauna habitat in the area. |
| Long-term Sustainability | M | Weed control and encouragement of understorey vegetation may be required to maintain the ecological values of the area in the long term. |

**Final Consideration (of other matters: Section D, page B-19 of Timaru District Plan):**
This area is protected by its location on a steep limestone slope. The limestone rock and steepness of the slope limit its potential for farm development, though parts of the area are suitable for further pasture development.

**Discussion:**
This area just meets the District Plan criteria for a Significant Natural Area. Important features of the area are the health and diversity of the shrubland community, the link this shrubland provides between three separate areas of indigenous forest and the habitat the area provides for birds including rifleman (an 'at risk' species).

# TIMARU DISTRICT SNA SURVEY AREA 169

**Area Name:** Kakahu Coal Mine
**Property:** Gerald Hargreaves
**Location (central map reference):** J38: 567-727
**Nearest Locality:** Kakahu Bush
**Ecological District:** Geraldine
**Area Size (ha):** ?
**Altitude (m):** 140-160
**Surveyors:** Mike Harding
**Survey Time:** 1½ hours
**Survey Date:** 21-05-09

## General Description:

This SNA lies on a steep bank above the Hall valley stream at the site of the old Kakahu Coal Mine. It is surrounded by plantation pine forest and dense blackberry. The bottom boundary is the stream.

## Plant Communities:

Podocarp-hardwood forest is the main plant community present, described below. Naturalized (exotic) species are indicated with an asterisk*.

The forest canopy comprises totara, kahikatea, kanuka, broadleaf, matipo, lemonwood, lancewood, cabbage tree, mahoe, wineberry and pohuehue. Trunk diameters (at breast height) of the tall straight totara trees range between 41 and 72 cm.

A very diverse range of understorey and subcanopy species is present: mapou, mahoe, marbleleaf, kaikomako, rohutu, fuchsia, narrow-leaved lacebark, lowland ribbonwood, *Coprosma crassifolia*, *Coprosma rhamnoides*, *Coprosma rotundifolia*, *Coprosma areolata*, *Raukaua anomalus*, poataniwha, shrubby mahoe, weeping mapou, pate, horopito, turepo, *Calystegia tuguriorum*, native jasmine, sycamore*, Himalayan honeysuckle* and saplings of totara and kahikatea.

Ground-cover species present are hen and chickens fern, hound's tongue fern, necklace fern, common shield fern, prickly shield fern, *Blechnum chambersii*, *Blechnum minus*, *Blechnum fluviatile*, *Pellaea rotundifolia*, pennywort, hairy pennywort, toatoa, nettle, *Carex forsteri*, blackberry* and seedlings of matipo, mapou, mahoe, five-finger, wineberry, rohutu and sycamore*.

Additional canopy and sub-canopy species present on the small river flat at the base of the slope are matai, marbleleaf, sycamore*, narrow-leaved lacebark, pokaka, turepo and kaikomako. Additional understorey and ground-cover species here are *Neomyrtus pedunculatus*, bush lily, *Blechnum penna-marina*, *Hypolepis ambigua*, *Australina pusilla* and hookgrass,

Additional species present at the upper forest margin, adjacent to the pine plantation, are gorse* and broom*.

## Birds/Fauna Observed:

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

## Notable Flora, Fauna and Habitats:

Important features of this area are the presence of podocarp trees and podocarp regeneration (kahikatea, totara and matai), the diversity of the flora (54 plant species), the habitat the area provides for an 'at risk' bird species (rifleman), the presence of a large number of locally-uncommon plant species (*Australina pusilla*, *Blechnum minus*, toatoa, kaikomako, lowland ribbonwood, horopito and *Raukaua anomalus*) and the contribution the area makes to the network of fauna habitat in the area.

## Notable Plant and Animal Pests:

Sycamore is the most important plant pest present. Other naturalised plants do not pose a significant threat to the integrity of the forest, though blackberry could become more dominant. Animal pests were not surveyed.

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

The area is very well buffered by its location on a steep bank with a stream at the base. The surrounding pine plantation and dense blackberry in the understorey along the stream protect the area from grazing. The area does not adjoin other areas of indigenous vegetation, though lies very close to a regionally-important protected area at Kakahu Bush.

**Condition and Management Issues:**
The forest canopy and understorey are in very good condition, probably because the forest has been well protected from stock. The main management issue is removal of sycamore.

**Property Owner Comment:**

## ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

| Primary Criteria | Rank | Notes |
|---|---|---|
| Representativeness | H | A very good example of indigenous vegetation typical of the ecological district and containing a good range of species representative of the original forest. |
| Rarity | M | Provides habitat for an 'at risk' bird species (rifleman) and supports populations of a number of locally-uncommon plant species. |
| Diversity and pattern | M/H | A very diverse forest remnant containing at least 54 plant species including a diverse range of canopy species. |
| Distinctiveness/special features | M | The presence of the old coal mine is a special feature. |
| **Other Criteria** | | |
| Size/shape | M | A relatively small area but very well buffered. |
| Connectivity | M | Makes an important contribution to the network of fauna habitat in the area. |
| Long-term Sustainability | M/H | Sycamore and animal pests (possums) are the only significant current threats to the area. |

**Final Consideration (of other matters: Section D, page B-19 of Timaru District Plan):**
This area is protected by its location on a steep slope. Establishment of plantation pine forest around the area has further protected the indigenous forest from disturbance.

**Discussion:**
This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the presence of podocarps (kahikatea, totara and matai), the diversity of the flora (54 plant species), the habitat the area provides for an 'at risk' bird species (rifleman), the presence of a large number of locally-uncommon plant species (*Australina pusilla*, *Blechnum minus*, toatoa, kaikomako, lowland ribbonwood, horopito and *Raukaua anomalus*) and the contribution the area makes to the network of fauna habitat in the area.

# TIMARU DISTRICT SNA SURVEY AREA 170b

**Area Name:**
**Location (central map reference):** J38: 577-715
**Ecological District:** Geraldine
**Surveyors:** Mike Harding

**Property:** Gerald Hargreaves
**Nearest Locality:** Kakahu Bush
**Area Size (ha):** ?
**Altitude (m):** 160-289
**Survey Time:** 3 hours
**Survey Date:** 07-05-09 and 15-05-09

## General Description:

This SNA covers a prominent limestone scarp on the western part of the property above Hall Road. It is a long narrow area following the exposed limestone scarp, with most of the woody vegetation on the steeper western slope.

## Plant Communities:

Two main plant communities are present: indigenous forest on and below the scarp; and rockland and forest-margin vegetation along the scarp crest. These plant communities are described separately below. Naturalized (exotic) species are indicated with an asterisk*.

Scarp crest forest/shrubland/rockland vegetation:
The forest edge community is dominated by trees of mahoe. Other important canopy or sub-canopy trees are totara, weeping mapou, matipo, broadleaf, cabbage tree, *Clematis foetida*, pohuehue, native jasmine and leafless lawyer.

Plant species commonly present in the forest understorey are *Coprosma propinqua*, weeping mapou, pohuehue and *Clematis marata*. Other species occasionally present are poroporo, black nightshade*, bittersweet* and young totara.

The forest floor is grazed and open. Ground-cover species present are common shield fern, nodding thistle*, nettle*, horehound* and pasture grasses.

Species commonly present on or associated with areas of exposed limestone are *Asplenium lyallii*, *Epilobium nummulariifolium*, pennywort, hairy pennywort, *Cardamine debilis*, *Leptinella* sp., *Blechnum chambersii* and *Lagenifera petiolata*. Other species occasionally present are porcupine shrub, koromiko, flax, hound's tongue fern, toatoa, mountain akeake and stonecrop*.

The plant community grades to open pasture. Species commonly present on this forest margin are mahoe, *Coprosma propinqua*, matagouri, native broom, silver tussock and scrub pohuehue. Isolated trees on the forest margin are frequently smothered by pohuehue.

Podocarp-hardwood forest below the scarp:
This strip of forest covers the steep rubbly slope just below the exposed limestone scarp. The forest canopy is dominated by broadleaf and mahoe. Other canopy species are totara, five-finger, cabbage tree, matipo, mapou, kowhai, weeping mapou, pohuheue, mountain akeake and at one location on the lower forest margin a patch of tall kanuka. A single matai tree, with a trunk diameter (at breast height) of 50 cm, is present near the northern end of the forest.

The forest understorey is generally open, though steep rocky areas that are less accessible to stock support a greater diversity of species. Understorey species commonly present are *Coprosma propinqua*, leafless lawyer and occasionally bittersweet*, cabbage tree and poroporo. A single young plant (one metre tall) of fierce lancewood was observed in the understorey at map reference 2357635E-5672014N.

Common ground-cover species are *Asplenium lyallii*, common shield fern, maidenhair fern, hound's tongue fern, *Blechnum chambersii*, *Pellaea rotundifolia* and *Epilobium nummulariifolium*. Other ground-cover species present are *Leptinella* sp., *Schizeilema trifoliolatum*, *Oxalis* sp., pennywort, hairy pennywort, toatoa, and seedlings of mapou, mahoe, *Coprosma propinqua*, matipo and kowhai.

Species commonly present at the lower forest margin or in forest openings are *Coprosma propinqua*, *Clematis forsteri*, pohuehue, scrub pohuehue, leafless lawyer, *Parsonsia capsularis*, native broom, matagouri, weeping mapou, porcupine shrub, koromiko, blackberry*, gorse*, silver tussock, blue tussock and nodding thistle*. One small patch of old man's beard* is present at map reference 2357581E-5671635N

**Birds/Fauna Observed:**
Native birds observed during this survey were bellbird, fantail, spur-winged plover, rifleman, grey warbler and silvereye. 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 a 'gradual decline' plant species (fierce lancewood), the presence of podocarps (totara and matai), the spectacular limestone landform and the contribution the area makes to fauna habitat in the wider area.

**Notable Plant and Animal Pests:**
Old man's beard is the most important plant pest observed. It appears to be present at only one location. Other plant pests present do not pose a significant threat to the forest community. 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 has a long shape, but is quite large. It lies very close to other areas of indigenous forest on the property (SNA170c and SNA 174a), is contiguous with forest on the adjoining property to the southwest (SNA 170a) 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 the small old man's beard infestation are the most important management issues.

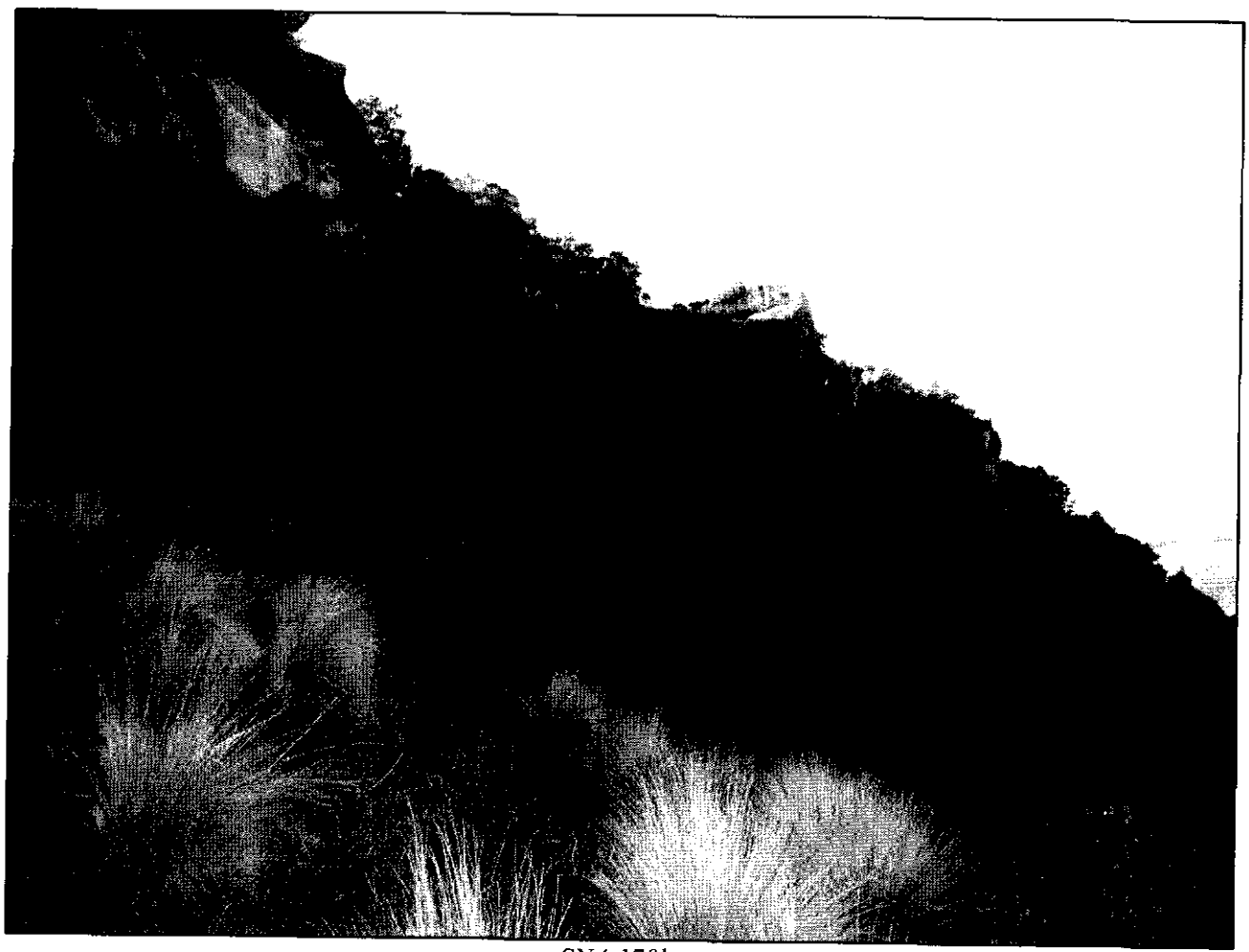
**Property Owner Comment:**

## ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

| Primary Criteria | Rank | Notes |
|---|---|---|
| Representativeness | M/H | A very good example of indigenous vegetation typical of the ecological district and containing a number of canopy species (including totara and matai) that are representative of the original vegetation. |
| Rarity | H | Provides habitat for rifleman (at risk), good potential habitat for long-tailed bat (nationally endangered) and contains fierce lancewood (gradual decline). Indigenous vegetation on limestone is a nationally-rare ecosystem. |
| Diversity and pattern | M/H | A good range of canopy species are present. Forty-five plant species were recorded (the most recorded on local limestone SNAs) |
| 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 | Makes an important contribution to the network of fauna habitat in the area. |
| Long-term Sustainability | M | The lack of understorey regeneration and the presence of old man's beard may threaten the long-term ecological value of the area. |

**Final Consideration (of other matters: Section D, page B-19 of Timaru District Plan):**
This area is well buffered by its location on a steep limestone scarp and associated slopes. It has very 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 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 a 'gradual decline' plant species (fierce lancewood), the presence of podocarps (totara and matai), the spectacular limestone landform and the contribution the area makes to fauna habitat in the wider area.



*SNA 170b*

# TIMARU DISTRICT SNA SURVEY AREA 170c

**Area Name:**
**Location (central map reference):** J38: 578-723
**Ecological District:** Geraldine
**Surveyors:** Mike Harding
**Property:** Gerald Hargreaves
**Nearest Locality:** Kakahu Bush
**Area Size (ha):** ?
**Altitude (m):** 270-290
**Survey Time:** 1 hour
**Survey Date:** 15-05-09

## General Description:

This SNA is a long narrow strip of forest on an exposed limestone ridge. It lies north of SNA 170b and south of SNA 167a.

## Plant Communities:

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

Podocarp-hardwood forest:
This plant community occupies the exposed ridge crest, comprising limestone bedrock and boulders. The forest canopy is dominated by totara, mahoe and broadleaf. Other canopy or sub-canopy species present are matai, cabbage tree, mapou, weeping mapou, matipo, kowhai and pohuehue. Trunk diameters (cm at breast height) of the larger trees are: totara, 40-85; matai, 32 and 47; and kowhai, 35-40.

The forest understorey and ground-cover are very sparse and open. Species present are *Coprosma propinqua*, black nightshade*, *Pellaea rotundifolia* and pennywort.

Other species, generally confined to limestone rock, are koromiko, hound's tongue fern, *Asplenium lyallii* and *Epilobium nummulariifolium.*

Shrubland:
This plant community forms a mostly narrow strip of scattered woody vegetation along the margins of the taller forest. It is dominated by *Coprosma propinqua* and silver tussock. Other species present are native broom, weeping mapou, *Parsonsia capsularis*, leafless lawyer, *Calystegia tuguriorum*, *Clematis forsteri*, pohuehue and horehound*.

## Birds/Fauna Observed:

Very strong winds limited the effectiveness of bird observations. However, bellbird and rifleman were observed during this brief survey.

## Notable Flora, Fauna and Habitats:

Important features of this area are the occurrence of indigenous woody vegetation on a limestone substrate, the presence of podocarps (totara and matai), the habitat the forest provides for birds including rifleman (an 'at risk' species), and the proximity of the area to other areas of indigenous vegetation. Maori rock drawings may be present and, at one location, may be obscured by more recent painting.

## Notable Plant and Animal Pests:

No notable introduced plant pests were observed in the area. The native climber, pohuehue, poses a threat to indigenous trees and shrubs, especially those on the forest margin. Some herbaceous weeds, notably horehound and thistles, pose some threat to forest margin communities. Animal pests were not surveyed.

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

This SNA is buffered to some extent by its location on an exposed limestone ridge, which has presumably protected the vegetation from previous disturbance. However, the area is long and narrow. It is not connected but lies close to other SNAs (SNA 170b, SNA 174a and SNA 176) and is part of a network of scattered areas of indigenous vegetation in the area.

## Condition and Management Issues:

The forest canopy is in reasonably good condition. The forest understorey is relatively open and depleted. The main management issue is encouragement of understorey regeneration.

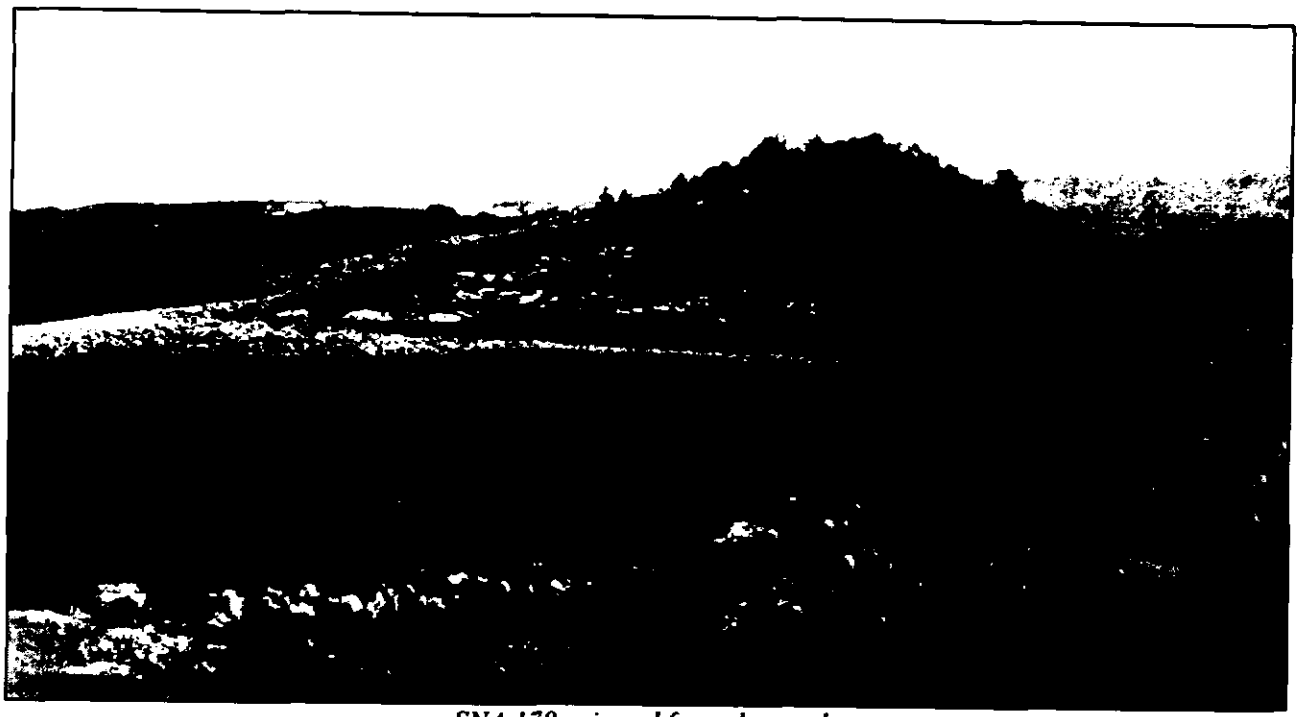
**Property Owner Comment:**

## ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

| Primary Criteria | Rank | Notes |
|---|---|---|
| Representativeness | M/H | A good example of podocarp-hardwood forest typical of the ecological district and containing species representative of the original vegetation, notably totara and matai. |
| Rarity | M | Provides habitat for an 'at risk' species (rifleman). Indigenous vegetation on limestone is a nationally-rare vegetation type. |
| Diversity and pattern | L/M | Species diversity is low. |
| Distinctiveness/special features | M | The limestone substrate and the presence of matai are notable features. Maori rock drawings may be present. |
| **Other Criteria** | | |
| Size/shape | M | A moderate-sized area but with a narrow shape and not well buffered. |
| Connectivity | M | An important part of a network of fauna habitat in the area. |
| Long-term Sustainability | M | Encouragement of understorey vegetation may be required to maintain the ecological values of the area in the long term. |

**Final Consideration (of other matters: Section D, page B-19 of Timaru District Plan):**
This area is protected by its location on an exposed limestone ridge, limiting 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 occurrence of indigenous woody vegetation on a limestone substrate, the presence of podocarps (totara and matai), the habitat the forest provides for birds including rifleman (an 'at risk' species), and the proximity of the area to other areas of indigenous vegetation. Maori rock drawings may be present.



*SNA 170c viewed from the north*

# TIMARU DISTRICT SNA SURVEY AREA 171a

**Area Name:**
**Location (central map reference):** J38: 576-730
**Ecological District:** Geraldine
**Surveyors:** Mike Harding
**Property:** Gerald Hargreaves
**Nearest Locality:** Kakahu Bush
**Area Size (ha):**
**Altitude (m):** 150-220
**Survey Time:** 1 hour
**Survey Date:** 15-05-09

## General Description:

This SNA comprises a large area of kanuka forest on gentle to moderately-steep dissected northwest-facing slopes in the upper reaches of a small tributary of the Kakahu River (in the Hall Road valley).

## Plant Communities:

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

Young kanuka forest (most of the area):
The forest canopy is dominated by kanuka. Other canopy species present are pohuehue and (rarely) matipo and wineberry. Trunk diameters (at breast height) of the large kanuka trees range between 15 and 20 cm.

The forest understorey is relatively open. Species present are *Coprosma propinqua*, *Coprosma rhamnoides*, matipo, mahoe, leafless lawyer, bush lawyer, lawyer, *Calystegia tuguriorum* and poroporo.

The forest ground-cover is dominated in open areas by pasture grasses. In other areas ground-cover species present are pennywort, foxglove*, *Hypolepis ambigua*, necklace fern, *Pellaea rotundifolia*, common shield fern, bidibid, *Dichondra* sp., *Leptinella* sp. and seedlings of *Coprosma propinqua*, *Coprosma rhamnoides*, pohuehue, blackberry* and matipo.

Plant species present in the small gullies and alongside streams are wineberry, fuchsia, *Coprosma crassifolia*, prickly shield fern, hound's tongue fern, hen and chickens fern, *Blechnum penna-marina*, *Blechnum fluviatile* and *Carex secta*.

The forest margins and forest openings are dominated by patches of gorse*. Other species present here are *Coprosma rotundifolia*, *Coprosma propinqua*, native broom, matagouri, pohuehue, blackberry*, Himalayan honeysuckle*, hawthorn* and silver tussock.

Older kanuka forest:
An area of older kanuka forest is present in the centre of the area on gentle shadier south-facing slope. The forest canopy here is also dominated by kanuka. Trunk diameters (at breast height) of the larger trees range between 25 and 35 cm. Other canopy or sub-canopy species present are mahoe, matipo, wineberry, lancewood and five-finger.

The forest understorey here is substantially denser and more diverse that in the younger kanuka forest. Dominant species are *Coprosma rhamnoides* and *Coprosma rigida*. Other understorey species are *Coprosma rotundifolia*, *Coprosma propinqua*, mahoe, lancewood, hawthorn*, native jasmine, scrub pohuehue, bush lawyer and *Clematis marata*.

Important ground-cover species are *Blechnum fluviatile* and bidibid. Other ground-cover species present are prickly shield fern, *Hypolepis ambigua*, thousand-leaved fern, necklace fern, *Blechnum penna-marina*, foxglove*, blackberry*, pennywort and seedlings of mahoe, wineberry and *Coprosma* species.

Additional species present in forest openings are Himalayan honeysuckle*, hard fern and male fern*.

## Birds/Fauna Observed:

Native birds observed during this brief survey were silvereye, fantail (including black-morph birds), bellbird, rifleman and brown creeper.

**Notable Flora, Fauna and Habitats:**
Notable features of this area are the extent of the forest bird habitat, the habitat the area provides for forest birds such as rifleman and black-morph fantail, the diversity (in places) of the vegetation and the contribution the area makes to the network of fauna habitat in the wider area.

**Notable Plant and Animal Pests:**
Hawthorn is the only notable woody plant pest present. Other species, such as gorse and the native climbing pohuehue appear unlikely to pose a significant threat to indigenous vegetation. Animal pests were not surveyed though pig-rooting was observed.

**Boundaries (buffering, fencing, adjoining plant communities and habitats):**
This area is well buffered by its location at the head of a small valley. It is unfenced but substantial parts of the area do not appear to be heavily grazed. The area lies close to other areas of indigenous vegetation, including SNA 167a, SNA 170c and SNA 171b.

**Condition and Management Issues:**
Control of invasive woody weed, such as hawthorn, and encouragement of understorey regeneration are important management issues.

**Property Owner Comment:**

## ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

| Primary Criteria | Rank | Notes |
|---|---|---|
| Representativeness | M | A good example of kanuka forest that is typical of the ecological district. |
| Rarity | M | Provides habitat for an 'at risk' species (rifleman). |
| Diversity and pattern | M | Relatively diverse for kanuka forest, though plant species diversity is reduced from that originally present. |
| Distinctiveness/special features | L/M | |
| **Other Criteria** | | |
| Size/shape | M/H | A relatively large area with a good shape and well buffered by its location. |
| Connectivity | M | Lies close to other SNAs |
| Long-term Sustainability | M | Some plant and animal 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):**
This area has been informally protected by the landowner. It could be developed for farming, though the presence of numerous small dissected stream gullies may limit its potential.

**Discussion:**
This area meets the District Plan criteria for an SNA. Important features of the area are the extent of the forest bird habitat, the habitat the area provides for forest birds such as rifleman and black-morph fantail, the diversity (in places) of the vegetation and the contribution the area makes to the network of fauna habitat in the wider area.

# TIMARU DISTRICT SNA SURVEY AREA 171b

**Area Name:**
**Location (central map reference):** J38: 576-725
***Ecological District:*** *Geraldine*
**Surveyors:** Mike Harding

**Property:** Gerald Hargreaves
**Nearest Locality:** Kakahu Bush
**Area Size (ha):** ? **Altitude (m):** 180-230
**Survey Time:** ½ hour **Survey Date:** 15-05-09

## General Description:
This SNA lies on moderately-steep south-facing slopes south of SNA 171a.

## Plant Communities:
Kanuka-hardwood forest is the main plant community present. This is described below. Naturalized (exotic) species are indicated with an asterisk*.

The forest canopy of most of the area is dominated by tall kanuka. Other canopy species at the east side of the area are trees of totara and narrow-leaved lacebark. Elsewhere, other canopy or sub-canopy species present are lancewood, fuchsia, wineberry, cabbage tree and pohuehue. Old senescent broadleaf trees are present on limestone at the upper edge of the area.

The forest understorey is very open. Species present are leafless lawyer, lawyer and *Coprosma propinqua.*

Ground-cover species present are necklace fern, pennywort, *Blechnum fluviatile*, common shield fern, *Hypolepis ambigua*, foxglove* and seedlings of mahoe and *Coprosma propinqua.*

A damp area near the centre of the SNA supports rushes (*Juncus* sp), *Carex coriacea* and gorse*.

## Birds/Fauna Observed:
Native birds observed during this brief survey were bellbird and grey warbler.

## Notable Flora, Fauna and Habitats:
Important features of this area are the presence of indigenous vegetation on limestone (at the top boundary of the area), the presence of totara and narrow-leaved lacebark, the habitat the area provides for forest birds and its proximity to other areas of indigenous forest.

## Notable Plant and Animal Pests:
The area is free of aggressive plant pests, though the native climber pohuehue (*Muehlenbeckia australis*) poses a threat to the area.

## Boundaries (buffering, fencing, adjoining plant communities and habitats):
The area is buffered by its location on steep south-facing slopes. It lies close to a much larger area of kanuka forest (SNA 171a) and quite close to areas of indigenous forest on limestone ridges (SNA 167a and SNA 170c).

## *Condition and Management Issues:*
The forest canopy is in relatively good condition. However, the forest understorey is depleted. An important issue is the encouragement of understorey regeneration.

## Property Owner Comment:

## ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

| Primary Criteria | Rank | Notes |
|---|---|---|
| Representativeness | M | A good example of indigenous forest typical of regenerating forest in the ecological district and containing species representative of the original forest: totara and narrow-leaved lacebark. |
| Rarity | M | Provides suitable habitat for rifleman, an 'at risk' species, which was observed nearby. Vegetation in the upper part of the area is on outcropping limestone, a nationally-rare ecosystem. |
| Diversity and pattern | L/M | Low species diversity, though totara and narrow-leaved lacebark are present. |
| Distinctiveness/special features | L/M | The presence of a small wetland at the lower margin of the area is a special feature. |
| **Other Criteria** | | |
| Size/shape | M | A small to moderate-sized area with a good shape and reasonably well buffered. |
| Connectivity | M | Part of a network of forest bird habitat. |
| Long-term Sustainability | M | Encouragement of understorey regeneration will be necessary for the long-term maintenance of ecological values. |

**Final Consideration (of other matters: Section D, page B-19 of Timaru District Plan):**
This area is protected by its location on moderately-steep slopes. 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 indigenous vegetation on limestone (at the top boundary of the area), the presence of totara and narrow-leaved lacebark, the habitat the area provides for forest birds and its proximity to other areas of indigenous forest.

# TIMARU DISTRICT SNA SURVEY AREA 173a

**Area Name:** Hall Valley Wetlands
**Location (central map reference):** J38: 573-714
**Ecological District:** Geraldine
**Surveyors:** Mike Harding
**Property:** Gerald Hargreaves
**Nearest Locality:** Kakahu Bush
**Area Size (ha):** ?
**Altitude (m):** 110
**Survey Time:** ¼ hour
**Survey Date:** 29-05-09

**General Description:**
This SNA lies on a recent terrace of the stream in the Hall Road valley. It covers a small low-lying area that appears to hold permanent water and may well be occasionally inundated when the stream is in flood. It is part of a series of small wetlands on this alluvial flat, most of which lie on the adjacent (down-valley) property. This wetland area was not surveyed in detail (partly because of the presence of curious horses) though appears, from nearby, to meet the District Plan significance criteria.

**Plant Communities:**
The main plant communities present are sedgeland and rushland. These communities appear to be dominated by pukio (*Carex secta*), rautahi (*Carex coriacea*) and rushes (probably *Juncus gregiflorus*). There are areas of standing water and the wetland margin appears pugged by stock (presumably horses) in places. The main areas of wetland are surrounded by pasture with scattered rautahi and rushes. Gorse* scrub separates the wetland from the stream, though the wetland presumably drains to the stream. Crack willow* and kanuka trees are also present in the area.

**Notable Flora, Fauna and Habitats:**
Important features of this area are the presence of wetland vegetation, the apparent size of the larger wetland areas (with open water) and the contribution the wetland makes to the series of wetlands on the valley floor. Lowland wetlands are a nationally-rare ecosystem.

**Notable Plant and Animal Pests:**
Crack willow was the only important plant pest observed during this cursory inspection.

**Boundaries (buffering, fencing, adjoining plant communities and habitats):**
This wetland lies in open pasture. It is not fenced, though appears buffered to some extent by the depth of the standing water and by the presence of gorse scrub along the stream margin. It lies close to other areas of wetland down-valley and areas of indigenous forest and shrubland on the valley sides.

**Condition and Management Issues:**
The central part of the wetland appears to be in good condition. Protection of wetland vegetation from grazing and trampling, and removal of invasive plant pests (notably crack willow and gorse) are the main management issues.

**Property Owner Comment:**

## ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

| Primary Criteria | Rank | Notes |
|---|---|---|
| Representativeness | M | The plant communities appear typical of wetlands in the ecological district. |
| Rarity | M | Lowland wetlands are a nationally-rare ecosystem. |
| Diversity and pattern | L/M | Plant communities appear depleted. |
| Distinctiveness/special features | L/M | The presence of open water is a distinctive feature as most wetlands in the vicinity do not provide open water habitats. |
| **Other Criteria** | | |
| Size/shape | M | Moderate-sized for a lowland wetland. |
| Connectivity | M | Part of a series of wetlands on the valley floor. |
| Long-term Sustainability | L/M | Protection from drainage, cultivation and grazing probably necessary to maintain ecological values in the long term. |

**Final Consideration (of other matters: Section D, page B-19 of Timaru District Plan):**
This area of wetland vegetation appears to have survived because it is too wet too readily cultivate. It is unclear whether it is a natural wetland, or whether it results from past disturbance. However, it supports wetland vegetation and provides useful open-water habitat in an ecologically-important part of the district. It may provide potential for farm development, though would create only a relatively small area of pasture.

**Discussion:**
This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the presence of wetland vegetation, the apparent size of the larger wetland areas (with open water) and the contribution the wetland makes to the series of wetlands on the valley floor. Lowland wetlands are a nationally-rare ecosystem.

*SNA 173a viewed from SNA 170b*

# TIMARU DISTRICT SNA SURVEY Wetland 173a
# Wetland Record Form

| | |
|---|---|
| **Wetland name:** Hall Road Wetlands | **Date:** 29 May 2009 |
| **Property:** Kakahu Farm (Gerald Hargreaves) | **GPS/Grid Ref:** J38: 573-714 |
| **Altitude:** 110 m | **No. of plots sampled:** |
| **Location:** Adjacent to Hall Road | **Approximate size (ha):** |

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

**Surveyors:** Mike Harding

| Indicator | Indicator components | Specify and Comment | Score 0-5[1] | Mean score |
|---|---|---|---|---|
| Change in hydrological integrity | Impact of manmade structures | None apparent | 5 | 4.33 |
| | Water table depth | No detectable changes | 5 | |
| | Dryland plant invasion | Dominant at margins | 3 | |
| Change in physico-chemical parameters | Fire damage | None apparent | 5 | 4.33 |
| | Degree of sedimentation/erosion | Minor; at margins | 4 | |
| | Nutrient levels | Some stock nutrient | 4 | |
| | von Post index | | | |
| Change in ecosystem intactness | Loss in area of original wetland | Probably half lost | 3 | 4 |
| | Connectivity barriers | No obvious physical barriers | 5 | |
| Change in browsing, predation and harvesting regimes | Damage by domestic or feral animals | Margins affected by stock | 3 | 4 |
| | 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 | Only at margins | 4 | |
| **Total wetland condition index /25** | | | | **20.66** |

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

**Native fauna:** None observed (brief cursory inspection)

| Pressure | Rating[2] | Specify and Comment |
|---|---|---|
| Modifications to catchment hydrology | 0 | None apparent |
| Water quality within the catchment | 3 | Grazed by domestic stock |
| Animal access | 4 | Little impediment |
| Key undesirable species | 2 | Crack willow and gorse |
| % catchment in introduced vegetation | 3 | More than half |
| Other pressures | 1 | Fertiliser? |
| **Total wetland pressure index /30** | **13** | |

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 174a

**Area Name:**
**Location (central map reference):** J38: 580-720
**Ecological District:** Geraldine
**Surveyors:** Mike Harding

**Property:** Gerald Hargreaves
**Nearest Locality:** Kakahu Bush
**Area Size (ha):** ? **Altitude (m):** 160-220
**Survey Time:** 1 hour **Survey Date:** 07-05-09

## General Description:

This SNA lies on and adjacent to a prominent bench on an east-facing limestone slope. This SNA is connected to SNA 170 on the prominent limestone scarp is at the top of this slope by an area of open shrubland/tussockland/pasture. Most of the taller vegetation within this SNA lies on or adjacent to steeper areas of exposed limestone and around the series of prominent tomos along the limestone bench.

## Plant Communities:

Two main plant communities are present: mixed hardwood forest on limestone and tall kanuka forest on the slopes above the bench. These plant communities are described separately below. Naturalized (exotic) species are indicated with an asterisk*.

Hardwood forest on limestone:
The canopy of this forest is dominated by broadleaf, mahoe and pohuehue. Other canopy species present are kanuka, five-finger, cabbage tree, mapou and matipo.

The forest understorey and ground-cover are mostly quite open. Plant species present are *Coprosma propinqua*, *Coprosma crassifolia* and pohuehue.

Species commonly present on or adjacent to exposed limestone are *Asplenium lyallii*, *Epilobium nummulariifolium*, *Cardamine debilis*, pennywort and nettle. Other species occasionally present are mountain akeake, toatoa, *Blechnum fluviatile*, *Blechnum penna-marina*, *Blechnum chambersii* and mouse-ear hawkweed*.

Species commonly present on the forest margin are pohuehue, native jasmine, horehound*, nodding thistle* and occasionally gorse*

Kanuka forest on upper slopes:
These patches of forest are composed almost entirely of kanuka with a very open understorey. Other canopy or sub-canopy species present are pohuehue and *Coprosma propinqua*.

Both these forest communities grade to pasture and shrubland. Indigenous species commonly present in these adjacent communities are *Coprosma propinqua*, matagouri, pohuehue, silver tussock, mistletoe (on *Coprosma propinqua*) and scattered young trees of kanuka.

## Birds/Fauna Observed:

Native birds observed during this brief survey were bellbird, silvereye, rifleman, grey warbler and fantail. Kereru/NZ pigeon are likely to be present.

## Notable Flora, Fauna and Habitats:

Important features of this area are the presence of woody indigenous vegetation on limestone, the presence of limestone rock flora, the habitat the area provides for forest birds including rifleman (an 'at risk' species), the potential habitat the area provides for long-tailed bat (a 'nationally-endangered' species), the size of the area and its proximity to other important areas of indigenous vegetation.

## Notable Plant and Animal Pests:

Pohuehue (*Muehlenbeckia australis*) is the most important plant pest present. This indigenous climber is smothering substantial parts of this area, including tall canopy trees. Introduced plant pests present, such as gorse, do not pose a significant threat to the forest. Pasture grasses and some introduced herbaceous species, such as mouse-ear hawkweed, pose a threat to indigenous limestone rock flora. Animal pests were not surveyed.

**Boundaries (buffering, fencing, adjoining plant communities and habitats):**
This area is buffered to some extent by its position on exposed limestone boulders and scarps and by the rugged terrain of the scarps, bench and associated tomos. The taller indigenous vegetation of this SNA is linked to indigenous forest on the main limestone scarp at the crest of the slope (SNAs 170b and 170c) by scattered shrubland and tussockland. The SNA lies close to other areas of indigenous vegetation on limestone and to a large and important area of indigenous forest at Kakahu Bush.

**Condition and Management Issues:**
The forest canopy is in reasonably good condition. The forest understorey is open and depleted. The main management issues are the containment or control of pohuehue and encouragement of understorey regeneration.

**Property Owner Comment:**

## 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 selection of canopy species representative of the forest originally present. |
| Rarity | M/H | Provides habitat for an 'at risk' bird species (rifleman) and potential habitat for a 'nationally-endangered' species (long-tailed bat). Indigenous vegetation on limestone is a nationally-rare ecosystem type. |
| Diversity and pattern | L/M | Diversity is typical for this type of forest, though is much reduced from that originally present. |
| Distinctiveness/special features | M | The presence of tomos is a special feature. |
| **Other Criteria** | | |
| Size/shape | M | A moderate-sized area with a good shape, though slightly fragmented. |
| Connectivity | M | Partly connected (by shrubland and tussockland) to other areas of indigenous forest. Contributes to the network of fauna habitat in the area. |
| Long-term Sustainability | M | Encouragement of understorey regeneration may 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 partly protected by its location on broken limestone country, limiting its potential for farm development. It has been informally protected by the landowner and appears to have regenerated and increased in size over recent years.

**Discussion:**
This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the presence of woody indigenous vegetation on limestone, the presence of limestone rock flora, the habitat the area provides for forest birds including rifleman (an 'at risk' species), the potential habitat the area provides for long-tailed bat (a 'nationally-endangered' species), the size of the area and its proximity to other important areas of indigenous vegetation.

# TIMARU DISTRICT SNA SURVEY AREA 176a and b

**Area Name:**
**Location (central map reference):** J38: 582-727
**Ecological District:** Geraldine
**Surveyors:** Mike Harding

**Property:** Gerald Hargreaves
**Nearest Locality:** Kakahu Bush
**Area Size (ha):** ? **Altitude (m):** 180-240
**Survey Time:** ½ hour **Survey Date:** 07-05-09

## General Description:

This SNA comprises two areas of indigenous forest on limestone on either side of a small gully on east-facing slopes. This SNA lies close to SNA 170c and SNA 167a on the prominent limestone scarp at the top of these slopes, and close to SNA 174a south along the slope. A farm pond surrounded by planted poplar trees and pampas, and supporting large clumps of *Carex secta* at its margins, is present in the gully adjacent to this SNA.

## Plant Communities:

The main plant communities present are mixed hardwood forest on limestone and adjacent shrubland. These plant communities are described separately below. Naturalized (exotic) species are indicated with an asterisk*.

Hardwood forest on limestone:
The canopy of this forest is dominated by mahoe, broadleaf and pohuehue. Other canopy species present are cabbage tree, lancewood, mapou, matipo, leafless lawyer, native jasmine and pohuehue. A single totara tree, with a trunk diameter (at breast height) of 90 cm, is present in the gully (SNA 176b)

The forest understorey and ground-cover are mostly quite open. Plant species present are *Coprosma propinqua*, *Coprosma crassifolia*, black nightshade*, foxglove* and pohuehue.

Species commonly present on or adjacent to exposed limestone are *Asplenium lyallii*, common shield fern, *Epilobium nummulariifolium*, *Leptinella squalida*, *Blechnum chambersii*, pennywort and nettle.

Species commonly present on the forest margin are pohuehue, native jasmine, horehound*, nodding thistle* and occasionally flax.

Shrubland:
This shrubland community is dominated by *Coprosma propinqua*, matagouri and native broom. Other species present are *Coprosma crassifolia*, pohuehue and silver tussock.

## Birds/Fauna Observed:

Native birds observed during this brief survey were bellbird, rifleman and grey warbler. Welcome swallow nests are present in limestone overhangs. Kereru/NZ pigeon are likely to be present.

## Notable Flora, Fauna and Habitats:

Important features of this area are the presence of woody indigenous vegetation on limestone, the presence of limestone rock flora, the presence of totara, the habitat the area provides for forest birds including rifleman (an 'at risk' species), the potential habitat the area provides for long-tailed bat (a 'nationally-endangered' species) and the proximity of the area to other important areas of indigenous vegetation.

## Notable Plant and Animal Pests:

Pohuehue (*Muehlenbeckia australis*) is probably the most important plant pest present. This indigenous climber is smothering trees in parts of this area, especially lower-stature trees on exposed limestone (notably in SNA 176a). Pasture grasses and some introduced herbaceous species may pose a threat to indigenous limestone rock flora. Animal pests were not surveyed.

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

This area is buffered to some extent by its position on steep slopes and on exposed limestone rock in and adjacent to a gully. The SNA lies close to other areas of indigenous vegetation on limestone and to a large and important area of indigenous forest at Kakahu Bush.

## Condition and Management Issues:

The forest canopy is in reasonably good condition. The forest understorey is open and depleted. The main management issues are the containment or control of pohuehue and encouragement of understorey regeneration.

## Property Owner Comment:

## ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

| Primary Criteria | Rank | Notes |
|---|---|---|
| Representativeness | M | A good example of indigenous forest typical of the ecological district and containing a good selection of canopy species representative of the forest originally present, notably totara. |
| Rarity | M/H | Provides habitat for an 'at risk' bird species (rifleman) and potential habitat for a 'nationally-endangered' species (long-tailed bat). Indigenous vegetation on limestone is a nationally-rare ecosystem type. |
| Diversity and pattern | L/M | Diversity is typical for this type of forest, though is much reduced from that originally present. |
| Distinctiveness/special features | M | The presence of totara is a special feature. |
| **Other Criteria** | | |
| Size/shape | M | A relatively small area, but with a good shape and well buffered by its location in and adjacent to a gully. |
| Connectivity | M | Close to other areas of indigenous forest on limestone. Contributes to the network of fauna habitat in the area. |
| Long-term Sustainability | M | Encouragement of understorey regeneration may 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 partly protected by its location on steep limestone country, limiting its potential for farm development. It has been informally protected by the landowner.

## Discussion:

This area meets the District Plan criteria for a Significant Natural Area. Important features of the area are the presence of woody indigenous vegetation on limestone, the presence of limestone rock flora, the presence of totara, the habitat the area provides for forest birds including rifleman (an 'at risk' species), the potential habitat the area provides for long-tailed bat (a 'nationally-endangered' species) and the proximity of the area to other important areas of indigenous vegetation.

# TIMARU DISTRICT SNA SURVEY — AREA 183a

**Area Name:** Kakahu River scarp
**Location (central map reference):** J38: 605-728
**Ecological District:** Geraldine
**Surveyors:** Mike Harding
**Property:** Gerald Hargreaves
**Nearest Locality:** Kakahu Bush
**Area Size (ha):** ?
**Altitude (m):** 100
**Survey Time:** ½ hour
**Survey Date:** 29-05-09

## General Description:
This SNA lies on a moderately-steep to steep terrace scarp alongside the Kakahu River at the eastern end of the property. This area was not surveyed in detail. Instead, it was viewed through binoculars. While it is intended to survey this area more completely in future, the exterior view was sufficient to confirm that the area meets the District Plan significance criteria.

## Plant Communities:
The main plant community present is hardwood forest, with patches of emergent kanuka and dense scrub at the margins. Dominant canopy species on the gentler slopes at the west end are kanuka, wineberry, fuschsia, and pohuehue. Canopy species present on the steeper slopes further east are cabbage tree, lemonwood, mapou, mahoe, broadleaf and five-finger. Dense low-stature forest and scrub are present at the forest margins, especially at the western end of the area. This is dominated by blackberry*, broom*, gorse*, pohuehue and occasionally old man's beard*.

## Birds/Fauna Observed:
Native birds observed during this brief survey were grey warbler, fantail, silvereye and, on the adjacent river terrace, paradise shelduck, mallard and pukeko.

## Notable Flora, Fauna and Habitats:
Important features of this area are its size, its location adjacent to the Kakahu River, the relatively rarity of riverside scarp forest and the contribution the area makes to the network of fauna habitat in the area.

## Notable Plant and Animal Pests:
Old man's beard was the most important plant pest observed. Other plant pests observed, including pohuehue, appear largely confined to the forest margin. Animal pests were not surveyed.

## Boundaries (buffering, fencing, adjoining plant communities and habitats):
This area is very well buffered by its location on a steep riverside scarp and by dense scrub at its margins. Its lower (and probably upper) boundaries are fenced. It is located near to other areas of indigenous forest.

## Condition and Management Issues:
The forest was not inspected sufficiently closely to assess its condition. However, it appears well protected. Control of invasive plant pests, such as old man's beard, is an important management issue.

## Property Owner Comment:

## ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

| Primary Criteria | Rank | Notes |
|---|---|---|
| Representativeness | M | A typical example of regenerating indigenous forest in the ecological district. |
| Rarity | M | Presumably provides habitat for an 'at risk' bird species (rifleman). May provide habitat for bats. Riverside scarp forest is now a rare plant community in the ecological district, especially at such a low altitude (c.100 m). |
| Diversity and pattern | L/M | Species diversity appears (from the outside) to be relatively low. |
| Distinctiveness/special features | L/M | No distinctive features observed. The forest is visible from Winchester Hanging Rock Road. |
| **Other Criteria** | | |
| Size/shape | M/H | A small to moderate-sized area that is well buffered. |
| Connectivity | M | Adjoins other forest along the scarp to the east and is part of a network of fauna habitat in the area. |
| Long-term Sustainability | M | Some management (such as weed control) will probably be necessary 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 of forest is well protected by its location on steep slopes. It has very limited potential for farm development, though parts of it could support plantation forestry. It has been informally protected by the landowner.

**Discussion:**
This area meets the District Plan criteria for a Significant Natural Area. Important features are the size of the area, its location adjacent to the Kakahu River, the relatively rarity of riverside scarp forest and the contribution the area makes to the network of fauna habitat in the area.

# TIMARU DISTRICT SNA SURVEY AREA 184a-d

| | | |
|---|---|---|
| **Area Name:** | **Property:** Gerald Hargreaves | |
| **Ecological District:** Geraldine | **Nearest Locality:** Kakahu Bush | |
| **AREA 184a: Location** (central map ref.): J38: 589-735 | **Area Size (ha):** ? | **Altitude (m):** 190-240 |
| **AREA 184b: Location** (central map ref.): J38: 592-733 | **Area Size (ha):** ? | **Altitude (m):** 200-240 |
| **AREA 184c: Location** (central map ref.): J38: 593-730 | **Area Size (ha):** ? | **Altitude (m):** 180-220 |
| **AREA 184d: Location** (central map ref.): J38: 592-731 | **Area Size (ha):** ? | **Altitude (m):** 150-180 |
| **Surveyors:** Mike Harding | **Survey Time:** 2 hours | **Survey Date:** 18-05-09 |

## General Description:

This SNA comprises four separate areas of indigenous forest on outcropping limestone on southwest-facing slopes of the valley south of Rocky Ridges. These areas of forest are separated by areas of pasture and scattered shrubland, which though valuable as linkages are not themselves significant (when assessed against the District Plan criteria).

## Plant Communities:

Two main plant communities are present, hardwood forest and, at the forest margins, shrubland. These plant communities are described separately below. Naturalized (exotic) species are indicated with an asterisk*.

Hardwood Forest:

The forest canopy in each of these areas is variously dominated by broadleaf, mahoe and pohuehue. Other canopy species present are cabbage tree, mapou, fuchsia, five-finger, matipo, *Parsonsia capsularis* and, in SNA 184a, kowhai and totara.

Understorey species present are *Coprosma propinqua*, mapou, poroporo, black nightshade*, leafless lawyer and *Clematis marata*.

Ground-cover species present are *Asplenium lyallii*, common shield fern, *Pellaea rotundifolia*, *Blechnum chambersii*, hound's tongue fern, *Epilobium nummulariifolium* and pennywort.

Shrubland:

This community is present at the margins of the forest patches and in some places extends between the patches. It is dominated by *Coprosma propinqua*, native broom, matagouri, leafless lawyer and silver tussock. Other species present are *Coprosma rugosa*, *Calystegia tuguriorum*, horehound*, gorse* and hemlock*.

## Birds/Fauna Observed:

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

## Notable Flora, Fauna and Habitats:

Important features of these areas are the occurrence of indigenous woody vegetation on limestone, the habitat the areas of forest and shrubland provide for forest birds including an 'at risk' species (rifleman), the presence of totara and the proximity of the forest patches to other areas of indigenous vegetation.

## Notable Plant and Animal Pests:

The forest patches are free of any significant introduced plant pests. However, they are affected by the native climber pohuehue (*Muehlenbeckia australis*).

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

Each of these areas is buffered to some extent by its location on exposed limestone, mostly on steep slopes. While each patch is relatively small, they are close enough to each other, and to other areas of indigenous vegetation, to be part of and contribute to fauna habitat in the wider area.

## Condition and Management Issues:

Encouragement of understorey regeneration is the main management issue.

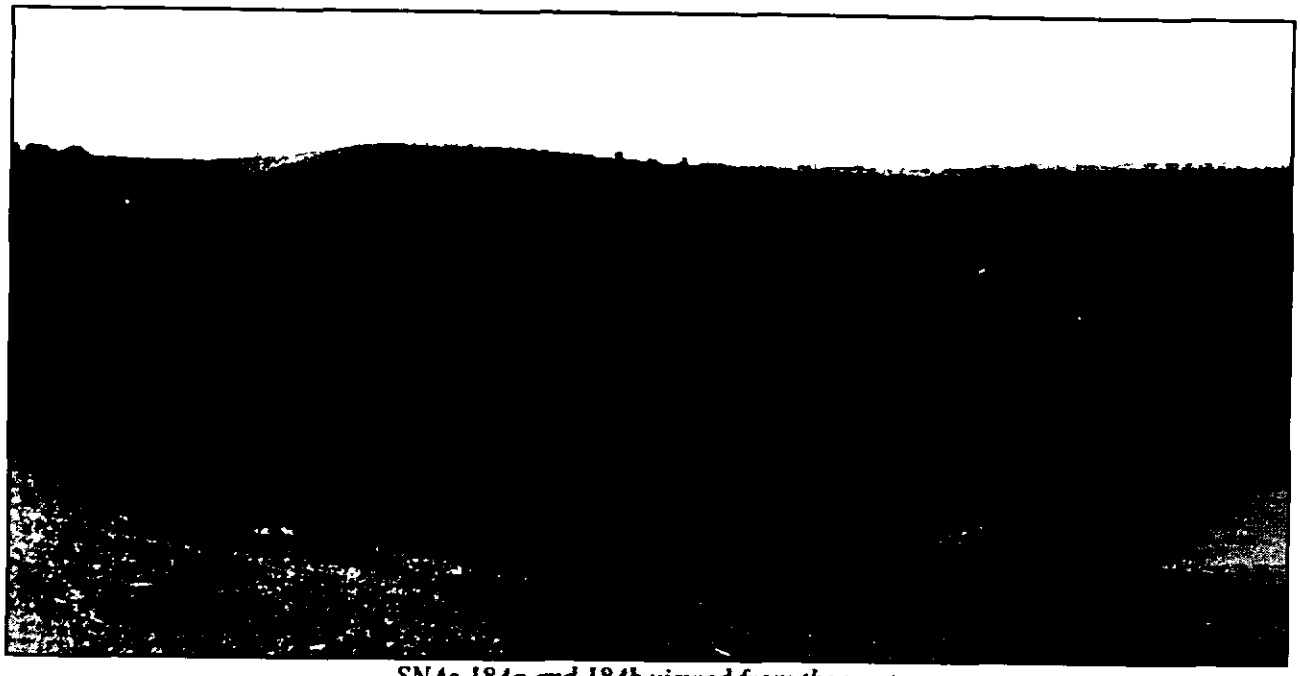
**Property Owner Comment:**

## ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

| Primary Criteria | Rank | Notes |
|---|---|---|
| Representativeness | M | Good examples of indigenous forest typical of such sites in the ecological district. SNA 184a contains totara; a species representative of a dominant component of the forests originally present in the area. |
| Rarity | M | These areas provide habitat for an 'at risk' bird species (rifleman). Indigenous forest on limestone is a nationally-rare ecosystem. |
| Diversity and pattern | L/M | Species diversity is substantially reduced. |
| Distinctiveness/special features | L/M | The presence of totara and kowhai is notable. |
| **Other Criteria** | | |
| Size/shape | M | Each area is small to moderate-sized, though well buffered. |
| Connectivity | M | These areas are connected to each other by shrubland and all are relatively close to other areas of indigenous vegetation. |
| Long-term Sustainability | L/M | Encouragement of understorey regeneration will be necessary to maintain the ecological values of these areas in the long term. |

**Final Consideration (of other matters: Section D, page B-19 of Timaru District Plan):**
These areas are protected by their location on steep outcrops of limestone. They have very limited potential for farm development.

**Discussion:**
These areas just meet the District Plan criteria for Significant Natural Areas. Important features of the areas are the occurrence of indigenous woody vegetation on limestone, the habitat the areas of forest and shrubland provide for forest birds including an 'at risk' species (rifleman), the presence of totara and the proximity of the forest patches to other areas of indigenous vegetation.



*SNAs 184a and 184b viewed from the west*

# TIMARU DISTRICT SNA SURVEY AREA 184g and h

| | | |
|---|---|---|
| **Area Name:** Ravensdown Ridge remnants | **Property:** Gerald Hargreaves | |
| **Ecological District:** Geraldine | **Nearest Locality:** Kakahu Bush | |
| **AREA 184g: Location** (central map ref.): J38: 597-724 | **Area Size (ha):** ? | **Altitude (m):** 150 |
| **AREA 184h: Location** (central map ref.): J38: 600-722 | **Area Size (ha):** ? | **Altitude (m):** 100 |
| **Surveyors:** Mike Harding | **Survey Time:** 1 hour | **Survey Date:** 29-05-09 |

## General Description:

This SNA comprises two separate areas of indigenous forest on outcropping limestone on southwest-facing slopes below the limestone ridge that forms the boundary with the Ravensdown property, south of Rocky Ridges. The southernmost area (SNA 184h) lies mostly on the Ravensdown property. These areas of forest are separated by areas of pasture with scattered shrubs.

## *Plant Communities:*

Two main plant communities are present, hardwood forest and, at the forest margins, shrubland. These plant communities are described below for each SNA. Naturalized (exotic) species are indicated with an asterisk*.

SNA 184g:

This community comprises a relatively narrow strip of forest on a partly-exposed limestone scarp on moderately steep slopes just below the main ridge. The forest canopy is dominated by broadleaf, mahoe and pohuehue. Other canopy species present are hawthorn* and cabbage tree.

Understorey and ground-cover species present are *Coprosma propinqua*, poroporo, bittersweet*, black nightshade, *Asplenium lyallii*, *Blechnum chambersii*, hound's tongue fern, necklace fern and pennywort.

Species present at the forest margin are *Coprosma propinqua*, native broom, native jasmine, *Calystegia tuguriorum*, mistletoe (on *Coprosma propinqua*), gorse*, elderberry*, hemlock*, nettle* and horehound*.

SNA 184h:

This community comprises hardwood forest and associated shrubland on a steep limestone bluff at the base of the ridge by the Kakahu River. Most of the area of forest and rockland appears to lie on the adjacent Ravensdown property. The forest community on the bluff face and around the base of the bluff is described below.

Dominant indigenous trees present are broadleaf and mahoe. Other canopy or forest margin trees, shrubs and climbers are pohuehue, cabbage tree, five-finger, elderberry*, crack willow*, koromiko, *Coprosma propinqua*, native broom, matagouri, weeping mapou, mountain akeake, hawthorn*, *Calystegia tuguriorum*, native jasmine, *Clematis foetida*, gorse* and mistletoe (on *Coprosma propinqua*).

Additional species present in the forest understorey, on limestone or at the forest margin are tree nettle, gooseberry*, hemlock*, bittersweet*, Himalayan honeysuckle*, blackberry*, flax, *Asplenium lyallii*, *Blechnum chambersii* and pennywort.

Tree nettle (*Urtica ferox*) forms large patches at the base of the bluff. This is a locally-uncommon species; it has not previously been recorded in the Geraldine Ecological District during this SNA survey.

## Birds/Fauna Observed:

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

## Notable Flora, Fauna and Habitats:

Important features of this area are the occurrence of indigenous woody vegetation on limestone, the habitat the areas of forest and shrubland provide for forest birds, the presence of a locally uncommon plant species (tree nettle) and the proximity of the forest patches to other areas of indigenous vegetation.

**Notable Plant and Animal Pests:**
Hawthorn and the native climber pohuehue (*Muehlenbeckia australis*) are the most important plant pests present, though neither species is dominant. Animal pests were not surveyed.

**Boundaries (buffering, fencing, adjoining plant communities and habitats):**
These two areas are buffered to some extent by their location on exposed limestone, mostly on steep slopes. While each patch is relatively small, they are close enough to each other, and to other areas of indigenous vegetation, to be part of and contribute to fauna habitat in the wider area.

**Condition and Management Issues:**
Protection of the forest margin and encouragement of understorey regeneration are the main management issues.

**Property Owner Comment:**

## ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

| Primary Criteria | Rank | Notes |
|---|---|---|
| Representativeness | M | Typical examples of indigenous forest on limestone in the ecological district. |
| Rarity | M | Indigenous forest on limestone is a nationally-rare ecosystem. A locally-uncommon plant species (tree nettle) is present at SNA 184h. |
| Diversity and pattern | L/M | Species diversity is substantially reduced. |
| Distinctiveness/special features | L/M | The bluff within SNA 184h is a prominent landform that is visible from Winchester Hanging Rock Road. |
| **Other Criteria** | | |
| Size/shape | M | Each area is small to moderate-sized. |
| Connectivity | M | These areas are relatively close to each other and are part of a network of fauna habitat in the wider area. |
| Long-term Sustainability | L/M | Protection of the forest margin and encouragement of understorey regeneration will be necessary to maintain the ecological value of these areas in the long term. |

**Final Consideration (of other matters: Section D, page B-19 of Timaru District Plan):**
These areas are partly protected by their location on steep outcrops of limestone. They have very limited potential for farm development.

**Discussion:**
These areas just meet the District Plan criteria for Significant Natural Areas. Important features of the areas are the occurrence of indigenous woody vegetation on limestone, the habitat the areas of forest and shrubland provide for forest birds, the presence of a locally uncommon plant species (tree nettle) and the proximity of the forest patches to other areas of indigenous vegetation.

# TIMARU DISTRICT SNA SURVEY AREA 229b

**Area Name:** Flethcer Road Scarp Forest
**Location (central map reference):** J38: 610-699
**Ecological District:** Geraldine
**Surveyors:** Mike Harding
**Property:** Gerald Hargreaves
**Nearest Locality:** Kakahu Bush
**Area Size (ha):** ? **Altitude (m):** 150-180
**Survey Time:** 1½ hours **Survey Date:** 29-05-09

## General Description:

This SNA lies in a small gully within a long south-facing scarp at the southern boundary of the property. The remainder of the forest on the scarp lies within SNA 229a on an adjoining property.

## Plant Communities:

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

The forest canopy is dominated by kanuka. Trunk diameters (at breast height) of the larger kanuka trees range between 30 and 55 cm. One large old kahikatea tree, with a trunk diameter of approximately 110 cm, is present at the base of the gully near the property boundary.

Other canopy species present are mahoe, cabbage tree, lancewood, lemonwood, pohuehue and native jasmine. Two young totara trees are present in the subcanopy.

Understorey species present are lawyer, mahoe, mapou, *Coprosma rotundifolia*, *Coprosma rhamnoides*, *Coprosma crassifolia*, *Coprosma areolata*, lemonwood, black nightshade* and elderberry*. Present but less common are poataniwha, turepo, *Coprosma propinqua* and rohutu.

Ground-cover species are necklace fern, hen and chicken's fern, *Asplenium hookerianum*, common shield fern, *Pellaea rotundifolia*, male fern*, pennywort and seedlings of mahoe, mapou, *Coprosma rotundifolia*, *Coprosma crassifolia*, cabbage tree, poroporo, native jasmine and pohuehue.

Canopy and understorey species present near the small stream are fuchsia, wineberry, pate, *Hypolepis ambigua*, *Blechnum fluviatile* and the large kahikatea tree.

Species commonly present on the forest margin are gorse*, blackberry*, elderberry*, black nightshade*, bracken, broom*, pohuehue, native jasmine and foxglove.

## Birds/Fauna Observed:

Native birds observed during this brief survey were grey warbler and fantail. Birds observed during an earlier survey of the adjacent scarp forest were bellbird, grey warbler, fantail and silvereye. NZ pigeon/kereru and rifleman are also likely to utilise this area.

## Notable Flora, Fauna and Habitats:

Important features of this area are the presence of podocarps (one large kahikatea tree and at least two small totara trees), the size of the area (along with the adjacent scarp forest) and the habitat the area provides for birds.

## Notable Plant and Animal Pests:

No aggressive introduced plant pests are present. However, the invasive native climber pohuehue (*Muehlenbeckia australis*) is present at the forest margin.

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

The area is well buffered by its location in a small south-facing gully and the adjacent area of scarp forest. Its boundaries are fenced, though the forest had been recently grazed by cattle at the time of survey. This area of forest (including the adjacent scarp forest) does not adjoin other areas of forest but is part of a network of fauna habitat in the area comprising scattered small stands of indigenous forest.

**Condition and Management Issues:**
The forest canopy is in relatively good condition. The forest understorey is more open, presumably in part due to the presence of cattle. Exclusion of stock and control of any invasive plant and animal pests are the most important management issues.

**Property Owner Comment:**

## ASSESSMENT AGAINST DISTRICT PLAN CRITERIA:

| Primary Criteria | Rank | Notes |
|---|---|---|
| Representativeness | M/H | An example of indigenous vegetation typical of the ecological district and containing species (notably kahikatea and totara) that are representative of the original vegetation. |
| Rarity | L/M | No rare plant species were observed, though the area almost certainly provides habitat for an 'at risk' bird species (rifleman). |
| Diversity and pattern | M | The forest understorey is relatively diverse, though species diversity is probably reduced from that originally present. |
| Distinctiveness/special features | M | The large kahikatea tree is a special feature. |
| **Other Criteria** | | |
| Size/shape | M | A relatively small area, though well buffered and in effect part of a larger area of forest. |
| Connectivity | M | An important part of the network of fauna habitat in the area. |
| Long-term Sustainability | M | Some management of grazing and plant and animal pests is probably required to protect the ecological values of the area in the long term. |

**Final Consideration (of other matters: Section D, page B-19 of Timaru District Plan):**
This area has been informally protected and fenced by the landowner. 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 podocarps (one large kahikatea tree and at least two small totara trees), the size of the area (along with the adjacent scarp forest) and the habitat the area provides for birds.

**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 (* = naturalised species) | Scientific name |
|---|---|
| barberry* | *Berberis glaucocarpa* |
| bidibid | *Acaena* sp. |
| bittersweet* | *Solanum dulcamara* |
| blackberry* | *Rubus fruticosus* |
| black nightshade* | *Solanum nigrum* |
| blue tussock | *Poa colensoi* |
| bracken | *Pteridium esculentum* |
| broadleaf | *Griselinia littoralis* |
| broom* | *Cytisus scoparius* |
| bush lawyer | *Rubus cissoides* |
| bush lily | *Astelia* sp. |
| cabbage tree/ti rakau | *Cordyline australis* |
| Californian thistle* | *Cirsium arvense* |
| cocksfoot* | *Dactylis glomerata* |
| common privet* | *Ligustrum vulgare* |
| common shield fern | *Polystichum richardii* |
| crack willow* | *Salix fragilis* |
| cranesbill* | *Geranium* sp. |
| creeping buttercup* | *Ranunculus repens* |
| elderberry* | *Sambucus nigra* |
| fescue tussock | *Festuca novae-zelandiae* |
| fierce lancewood | *Pseudopanax ferox* |
| five-finger | *Pseudopanax arboreus* |
| flax | *Phormium tenax* |
| foxglove* | *Digitalis purpurea* |
| fuchsia | *Fuchsia excorticata* |
| gooseberry* | *Ribes uva-crispa* |
| gorse* | *Ulex europaeus* |
| hairy pennywort | *Hydrocotyle moschata* |
| hard fern | *Paesia scaberula* |
| hawthorn* | *Crataegus monogyna* |
| hemlock* | *Conium maculatum* |
| hen and chickens fern | *Asplenium bulbiferum* |
| Himalayan honeysuckle* | *Leycesteria formosa* |
| holly* | *Ilex aquifolium* |
| hookgrass | *Uncinia* sp. |
| horehound* | *Marrubium vulgare* |
| horopito/pepperwood | *Pseudowintera colorata* |
| hound's tongue fern | *Microsorum pustulatum* |
| kahikatea/white pine | *Dacrycarpus dacrydioides* |
| kaikomako | *Pennantia corymbosa* |
| kanuka | *Kunzea ericoides* |
| Khasia berry* | *Cotoneaster simonsii* |
| koromiko | *Hebe salicifolia* |
| kowhai | *Sophora microphylla* |
| lancewood | *Pseudopanax crassifolius* |
| lawyer | *Rubus schmidelioides* |
| leafless lawyer | *Rubus squarrosus* |
| lemonwood | *Pittosporum eugenioides* |
| lotus* | *Lotus pedunculatus* |
| lowland ribbonwood | *Plagianthus regius* |
| mahoe/whiteywood | *Melicytus ramiflorus* |
| maidenhair fern | *Adiantum cunninghamii* |

| | |
|---|---|
| male fern* | *Dryopteris filix-mas* |
| mapou | *Myrsine australis* |
| marbleleaf/putaputaweta | *Carpodetus serratus* |
| matagouri | *Discaria toumatou* |
| matai/black pine | *Prumnopitys taxifolia* |
| matipo/kohuhu | *Pittosporum tenuifolium* |
| mistletoe | *Ileostylis micranthus* |
| mountain akeake | *Olearia avicenniifolia* |
| mouse-ear hawkweed* | *Hieracium pilosella* |
| narrow-leaved lacebark | *Hoheria angustifolia* |
| native broom | *Carmichaelia* aff. *australis* |
| native jasmine | *Parsonsia* sp. |
| necklace fern | *Asplenium flabellifolium* |
| nettle* | *Urtica* sp. |
| nodding thistle* | *Carduus nutans* |
| old man's beard* | *Clematis vitalba* |
| pampas* | *Cortaderia* sp. |
| pate | *Schefflera digitata* |
| pennywort | *Hydrocotyle* sp. |
| poataniwha | *Melicope simplex* |
| pohuehue | *Muehlenbeckia australis* |
| pokaka | *Elaeocarpus hookerianus* |
| poplar* | *Populus* sp. |
| porcupine shrub | *Melicytus alpinus* |
| poroporo | *Solanum laciniatum* |
| prickly shield fern | *Polystichum vestitum* |
| pukio | *Carex secta* |
| rautahi | *Carex coriacea* |
| rohutu | *Lophomyrtus obcordata* |
| Scotch thistle* | *Cirsium vulgare* |
| scrambling fuchsia | *Fuchsia perscandens* |
| scrub pohuehue | *Muehlenbeckia complexa* |
| sedge | *Carex* sp. |
| shrubby mahoe | *Melicytus micranthus* |
| silver tussock | *Poa cita* |
| soft rush* | *Juncus effusus* |
| stonecrop* | *Sedum acre* |
| sweet brier* | *Rosa rubiginosa* |
| sycamore* | *Acer pseudoplatanus* |
| thousand-leaved fern | *Hypolepis millefolium* |
| toatoa | *Haloragis erecta* |
| totara | *Podocarpus totara* |
| tree nettle | *Urtica ferox* |
| turepo | *Streblus heterophyllus* |
| weeping mapou | *Myrsine divaricata* |
| weeping totara | *Podocarpus totara* "pendula" |
| wineberry | *Aristotelia serrata* |
| Yorkshire fog* | *Holcus lanatus* |