

## Crown Pastoral Land Tenure Review

Lease name : Hakatere

Lease number : Pc 059

### Conservation resources report

As part of the process of tenure review, advice on significant inherent values within the pastoral lease is provided by Department of Conservation officials in the form of a conservation resources report. This report is the result of outdoor survey and inspection. It is a key piece of information for the development of a preliminary consultation document.

The report attached is released under the Official Information Act 1982.

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## **DOC CONSERVATION RESOURCES REPORT ON TENURE REVIEW OF HAKATERE CROWN PASTORAL LEASE**

### **PART 1**

#### **INTRODUCTION**

This report describes the significant inherent values of Hakatere Crown Pastoral Lease. The property is located in the 'Ashburton Lakes' area, inland from Mount Somers, Mid-Canterbury. The lease covers an area of approximately 9100 ha. The property boundaries are broadly defined by the South Ashburton River in the northeast, the Potts River in the west, and Lake Clearwater and Lambies Stream in the south.

Adjacent properties are Mt Possession (freehold) in the south, Mt Potts (Pastoral Lease) in the west, retired land in the north, and Mt Arrowsmith (Pastoral Lease) and Barossa Station (Pastoral Lease) in the NE.

Hakatere Station is evenly divided between Arrowsmith and Hakatere Ecological Districts in the Heron Ecological Region. There are six Recommended Areas for Protection on the property, identified in the 1986 Heron PNAP survey report. They are:

- Hakatere Priority Natural Area (PNA) 9 (Paddle Hill Creek),
- Hakatere PNA 10 (Ashburton Fans),
- Hakatere PNA 11 (Spider Lakes),
- Hakatere PNA 13 (Clearwater Moraines),
- Hakatere PNA 20 (Potts Gorge) and
- Arrowsmith PNA 5 (Dogs Range).

There are no protected areas on the property, though there are a number of protected areas in the Ashburton Lakes area. Lake Clearwater is a Wildlife Refuge, Mt Harper and Lake Denny to the south of Hakatere are Conservation Areas and Lake Camp is a Recreation Reserve.

### **PART 2**

#### **INHERENT VALUES: DESCRIPTION OF CONSERVATION RESOURCES AND ASSESSMENT OF SIGNIFICANCE**

##### **2.1 Landscape**

###### **2.1.1 Overview**

Hakatere is part of a wider high country landscape, where the dynamic qualities of the landscape are evident in its glacial and river formations. The lease largely consists of outwash surfaces, terraces, fans, wetlands and low mountain ranges. Altitude ranges from approximately 600m - 1300m.

The landscape retains a dominance of natural elements, and is a frontispiece to the high peaks, large braided rivers and lakes beyond. The property is highly visible from public roads, and contributes to the wider landscape of the Ashburton Lakes and Rangitata River. The key landscape components of the property are:

- The incised and well-defined Potts and South Ashburton Rivers.
- Glacial moraine formations adjacent to Lake Clearwater.
- Rocky outcrops carved by glacial meltwater.
- The pyramidal form of Mt Guy.
- Stony fluvioglacial outwash.
- Tussock covered land with isolated shrublands.

The visible cultural components are the musterer's hut at the top of the South Ashburton Gorge, farm tracks, fences and shelterbelts near public roads.

The landscape assessment focuses on visual elements. The property was divided into four units, which were individually assessed on the basis of landscape character and quality.

## 2.1.2 Evaluation of Landscape Units

### (1) Mt Guy/Moraine Outwash

Mt Guy dominates the centre of the lease, rising steeply from the valley floor. On the mountain's eastern edge the moraine outwash links the mountain with the South Ashburton River. This unit is characterised by the following:

- The beginning of the high country landscape as distinct from the hill country landscape.
- Dominated by the pyramidal Mt Guy and the huge expanse of moraine and outwash which allows distant views of the Rangitata River, Lake Heron and Arrowsmith Range.
- The pyramidal form of Mt Guy occurs elsewhere in the region e.g. Mt Sugarloaf at Lake Heron, but it provides an important focus to the unit.
- The long horizontal river terrace adjacent to the South Ashburton River.
- The kettleholes of Spider Lakes in moraine near the Hakatere-Potts Road. These glacial features are scattered through the eastern South Island high country, though they are best represented in Canterbury.
- Being located at the junction of two public roads, the unit is highly visible. Mt Guy and Dogs Hill stand like sentinels in the horizontal landscape and beyond them are the high mountains. This visibility makes the area highly sensitive to any changes.
- The two public roads and farm buildings reduce naturalness on the edge of the unit. Beyond this, naturalness increases due to a lack of human-induced elements and the largely indigenous vegetation.

#### Evaluation:

- This unit exhibits the classic components of an inter-montane basin with expansive outwash, pyramidal mountains and tawny ochre colours.
- The expansiveness allows the viewer to appreciate the mountains and valleys beyond. The sentinels of Mt Guy and Dogs Hill, and the long uninterrupted terraces are impressive as they rise from the flats.
- The subtle appearance of Spider Lakes among the moraines is unique.
- Overall, the landscape unit is very significant as an entry point to the high country.

## **(2) South Ashburton River**

The South Ashburton River flows out of a gorge on the north-eastern boundary of the property and forms the boundary of the lease before leaving the lease to flow eastwards. This unit is characterised by the following:

- The river is narrow and fast flowing through the incised rocky gorge with its craggy cliffs.
- The sequence of gorge, valley terraces and fans is impressive and graphically displayed.
- The visibility of the river diminishes towards the gorge end, but it is highly visible from the bridge on the Hakatere–Heron Road.
- There is a high degree of naturalness in this unit due to the intactness of its landforms and vegetation, and the lack of human modifications.
- Grazing, fences, farm tracks and a musterer's hut are the cultural elements. The hut is built in the New Zealand high country vernacular style and adds real interest and a finite point to the station's boundary.

### **Evaluation**

- This unit is significant for its well-defined landform and vegetation sequence of a constricted gorge, terraces and fans. It has an isolated quality, separated from the rest of the station by intervening high hills.

## **(3) Paddle Hill Creek**

This unit encompasses two hidden valleys that lie enclosed beyond the sentinels of Mt Guy and Dogs Hill. The E-W valley is dominated by high cliff faces, downcut by meltwater from a lobe of the Rangitata glacier. The N-S valley is smoothly 'U-shaped', covered in snow tussock and separated from the E-W valley by a terrace. The valleys have a distinct sense of enclosure and are further characterised by the following:

- The landscape has medium rarity for its snow tussock cover, and high rarity for its impressive rock bluffs and talus cones, which graphically demonstrate its glacial formation.
- The landscape has a high degree of harmony due to the intactness of its natural components.
- It has very low visibility due to the hidden nature of its valleys and its distance from public roads.
- The only human elements are farm tracks and fences.

### **Evaluation**

- Overall, the unit has significant natural and visual value. It contrasts with the remainder of the station because of its glacial landforms and moraine sequence. It has a cover of tall tussock from the valley floor to the rolling plateau tops, and there is also a distinct sense of enclosure.

## **(4) Lake Clearwater**

This unit encompasses the moraine terraces above Lake Clearwater and is characterised by the following:

- The moraine sequence between Lake Clearwater and the Dogs Range.
- The moraine and underlying greywacke bedrock has been deeply incised by the Potts River.

- The steep SW slopes of the Dogs Range are glacially shaped, with colluvial deposits below the higher rock outcrops. Its gentle plateau top has a mantle of till.
- There is harmony in the landscape sequence from the lake edge, to the Dogs Range and across to the deeply incised Potts River.
- The unit has a high degree of naturalness, except for the baches and shelterbelts at Lakes Clearwater and Camp. The bulldozed fenceline and track at Mystery Lake also reveal a human presence.
- Because of its elevated nature the landscape is highly visible, especially from Lake Clearwater and the Hakatere-Potts Road. The Clearwater basin is a popular destination with a bach settlement, and with many people using the lakes for water sports and fishing.

### **Evaluation**

- The altitudinal sequence from the lake to the Dogs Range is a unique landform-vegetation combination. Visually, the eye is drawn across Lake Clearwater to the tops of the Dogs Range. Key elements of this area the moraines, the rocky cliffs and talus cones of the Paddle Hill Creek area and the deeply incised Potts River.

## **2.2 Landforms & Geology**

Basement rocks are greywacke and sandstone (Torlesse Supergroup), and these form the main ranges. They have been sculptured by a series of glacial advances by the Rangitata glacier, and the Rakaia glacier east of Dogs Hill. Glaciers overtopped all the ranges leaving till deposits on their summits, though this is now largely masked by loess. Moraine terraces and ridges are abundant, and there are major fluvioglacial outwash surfaces. The largest lies east of Mt Guy and Dogs Hill, but they also extend along the SW side of the Dogs Range and Mt.Guy, and between the two. Mt Guy is a classic example of a roche moutonee, with its elongated form oriented in the direction of ice movement. Many wetlands are located in poorly drained moraine depressions, including kettleholes and tarns. There are some periglacial features on the summit plateau of the Dogs Range e.g. solifluction lobes.

More recent features are the terraces associated with the South Ashburton River and Paddle Hill Creek. The Potts River is deeply incised in moraine, creating a spectacular downcut river valley.

In terms of significance, the absence of through-drainage has resulted in the preservation of a classic sequence of moraines in the Clearwater depression (Oliver and Keene 1990). This sequence of moraines is at least of regional significance (Keene, pers.comm.). The Dogs Range is of regional significance for its "excellent examples of upland yellow-brown earth, tussock grassland and mountain toatoa associations" (Arand et al 1991). Paddle Hill Creek is of regional significance because it includes some of the best upland yellow-brown earth/tussockland association in the ecological district. The Lake Heron fault scarp, which extends across moraines and outwash from Spider Lakes to the South Ashburton river (east of Dogs Hill), is of regional significance (Kenny and Hayward 1993).

## **2.3 CLIMATE**

Summers are hot and dry with temperatures exceeding 30°C at times. Winters are cold, with frosts and snow being common with temperatures as low as -15°C

occurring in the valleys. Precipitation is around 850mm at Hakatere homestead (Burrows 1997), increasing to around 1500mm on the Dogs Range (Arand et al 1991). Northwest winds are frequently strong, and southerlies can often blanket the basin in low cloud.

## 2.4 VEGETATION

### Overview

Pre-European burning of the area greatly reduced its original forest cover, resulting in more extensive tussocklands. European farming further changed the vegetation through burning, grazing and oversowing and topdressing (OSTD). As a result, the Ashburton Lakes area is now characterised by a lack of forest cover and the dominance of grasslands, with wetlands and shrublands also being prominent. The same broad pattern is characteristic of Hakatere Pastoral Lease.

The vegetation of Hakatere is relatively simple, as it is largely within montane and subalpine zones, and woody communities are limited. Tussocklands are dominant, followed by wetlands and shrublands. Unusually, the property has not been extensively OSTD except along its SW margins. This is reflected in the vegetation, which retains good levels of indigenous biodiversity throughout.

The vegetation is described according to altitude, community type and geographical area. Formal species lists were made at 12 sample sites, and extensive notes taken elsewhere. Naturalness ratings were given from low (L) to high (H).

### 2.4.1 Vegetation Description

#### Montane Communities

##### (1) River Floodplain and Terrace Communities

These are found on the true right of the South Ashburton River near the Hakatere-Heron Road, and on the true left of the Potts River. They represent original successional communities characteristic of floodplains.

The braided South Ashburton riverbed cuts across fluvio-glacial outwash surfaces, resulting in a substantial area of these communities. The floodplain terraces have local topographical variations, with many small ridges and channels. Common plants include mosses, lichens, *Raoulia* spp, *Helichrysum depressum*, *Discaria toumatou* (matagouri), *Poa colensoi*, *Poa lindsayi*, *Stellaria gracilentia*, *Leucopogon fraseri* agg., *Muehlenbeckia axillaris* and *Luzula rufa*. Two threatened plants are present here - *Luzula celata* and *Muehlenbeckia ephedroides* (see Section 4). *Myosotis uniflora* is present (Lange 2001) and is categorised as 'data deficient'. Successional processes are highly natural and intact. Naturalness varies from M/H – H, as introduced plants are not prominent, except for *Hieracium pilosella* locally.

On older, higher surfaces, *Racomitrium lanuginosum* is dominant with low stature *Discaria toumatou* (matagouri), *Agrostis capillaris* (browntop), *Muehlenbeckia axillaris*, and lichens. Other introduced plants include white clover, sheep's sorrel and *Veronica arvensis*\*. Successional processes are highly natural and largely intact. Naturalness here varies from M – H.

The Potts River is not braided and these communities are less extensive. While the low terraces are quite narrow, they support typical riverbed species including

*Epilobium melanocaulon*, *Raoulia* spp, *Poa lindsayi*, *Stellaria gracilentia*, *Carex breviculmis*, *Muehlenbeckia axillaris*, *Discaria toumatou*, *Poa colensoi*, *Helichrysum depressum*, *Poa cita* (silver tussock), mosses and lichens, *Hieracium pilosella*\*, *Trifolium arvense*\*, *Rosa rubiginosa*\*, *Sagina procumbens*\*, *Juncus articulatus*\*, and *Rumex acetosella*\*. *Coriaria sarmentosa* is abundant along the margins of the active riverbed. Successional processes are highly natural and largely intact, though introduced plants are more prominent here. Naturalness is M – M/H.

Matagouri, *Meliccytus alpinus* and sweet brier dominate shrublands on older terrace treads and risers. They are of M – M/H naturalness.

## (2) Short Tussock

These communities are common, the main areas being on fluvio-glacial outwash surfaces and moraines in the east, and the lower Clearwater moraines. Smaller areas are found on terraces and fans above the South Ashburton Gorge, the fans and lower slopes of Mt Guy, and on outwash between the Dogs Range and Mt Guy.

Short tussock communities were originally characteristic of fluvio-glacial outwash surfaces, river terraces and fans. They still occur on those landforms, but elsewhere they have largely been induced from tall tussockland, shrublands and wetlands to a lesser extent. They often occur as a mosaic among other communities, especially tall tussock. Prominent species include: *Festuca novae-zelandiae*, *Coprosma petriei*, *Poa colensoi*, *Raoulia* spp., *Discaria toumatou*, *Leucopogon* spp., *Ranunculus multiscapus*, *Carex breviculmis*, *C. colensoi*, *Celmisia spectabilis*, *Celmisia* spp., *Pimelea oreophila*, *Brachyglottis bellidioides*, *Brachyscome radicata*, *Plantago novae-zelandiae*, *Chionochloa rigida*, *Gentiana corymbifera*, *Carmichaelia monroi*, *Gaultheria depressa*, *Luzula rufa*, *Anisotome flexuosa*, orchids, mosses and lichens. The threatened plants *Raoulia parkii* and *Pterostylis tristis* are found in this community (see Section 4). Introduced plants are common, especially *Hieracium pilosella*\*, *H. praealtum*\*, browntop and sweet vernal. The collective cover of these plants is usually 10-25%. Other introduced plants include *Veronica arvensis*\*, *Hypochoeris radicata*\*, *Rumex acetosella*\*, and *Rosa rubiginosa*\*.

There is a high diversity of indigenous plants in these communities, despite introduced plants being widespread. On exposed or wetter sites, introduced plants are less common and they tend to be more natural. Regeneration of native species is widespread, including *Festuca* tussock and blue tussock. Naturalness varies from L to M/H, but is usually moderate. RAP H9 includes short tussock on outwash surfaces, described in the Protected Natural Areas report as “some of the best in the district”.

The most degraded community is on outwash and moraines on either side of the Hakatere Potts Road. Exotic grasses, annuals and hawkweeds are common, and clover is abundant adjacent to the Hakatere homestead. In moist depressions, *Hieracium pilosella*\* can be up to 75% cover locally. On the south side of the road, the situation is similar, except that browntop is more abundant and native species are less abundant.

## (3) Tall Tussock

Narrow-leaved snow tussock is widespread on the Clearwater moraines, Paddle Hill Creek valley and moraines, and the shady slopes of Mt. Guy.

Where these communities are most dense (upper montane or shady aspects), species diversity is naturally lower. Where they are more open (co-dominant with *Fescue* tussock), species diversity is higher. On the upper Clearwater moraines tussock cover is typically 40-50%, though it can vary from 20-80%. Low matagouri, *Schoenus* and *Bulbinella* are prominent among dense tussock, while *Olearia bullata* and manuka occur locally. On exposed knolls, species composition is similar to that of exposed subalpine ridges i.e. lichens, mosses, *Poa colensoi*, *Coprosma petriei*, *Pimelea oreophila*, *Leucopogon colensoi* and *Celmisia spectabilis*. *Hieracium pilosella*\* and *Agrostis capillaris*\* typically have cover of 5-10%. Naturalness is often M/H or higher. As altitude decreases, snow tussock decreases and *Fescue* tussock increases, along with introduced grasses and hawkweeds. In large meltwater gullies it remains prominent on shady slopes and floors, except at lowest altitude. The threatened plant *Pterostylis tristis* was found in this community type.

#### (4) Shrublands

Shrublands are common across the property, especially in the South Ashburton Gorge and the Potts Valley. They characterise terrace risers, talus patches, bluffs, fans, gullies and stream margins. Some are primarily in the subalpine zone and are described in that section.

Matagouri shrublands are common on stream margins, terraces, lower hill slopes and moraines. They are also widespread adjacent to wetlands. Sometimes no other shrub species are present, but in other situations, their diversity is much higher. Where Paddle Hill Creek exits its valley, matagouri 3-4m tall is abundant. Other species include *Olearia bullata* var. *rugosa*, *Coprosma propinqua*, *Coprosma cheesemani*, *Hoheria lyallii*, *Hebe subalpina*, *Aristotelia fruticosa*, *Melicytus alpinus*, *Kunzea ericoides*, *Corokia cotoneaster*, *Carmichaelia australis*, *Gaultheria antipoda*, *Phormium cookianum*, *Pteridium esculentum*, *Polystichum vestitum*, *Hypolepis millefolium*, and *Rosa rubiginosa*\*. Similar but less diverse communities characterise smaller creeks that have down-cut the Lake Heron fault scarp south of here.

Shrublands on the terraces and lower slopes above the South Ashburton Gorge have a similar composition, but with widespread vines i.e. *Muehlenbeckia complexa*, *Parsonsia capsularis* and *Rubus schmidelioides*. In the Potts Valley 20-30 Hall's totara are present among manuka, kanuka and grey shrubs on the large terrace riser. In riparian shrubland, additional species include *Griselinia littoralis*, *Dracophyllum longifolium*, *Hebe salicifolia*, *Olearia avicenniifolia* and *Clematis quadribacteolata*. Sweet brier is the main introduced shrubweed here, especially in the lower valley or where recent burning has occurred. RAP H20 is upstream of these shrublands, but interestingly, Hall's totara, kanuka and manuka are not referred to. The threatened plant *Clematis marata* was found in these shrublands.

Typically, the main problem weed in shrublands is *Sambucus nigra*\* (elderberry), with sweet brier being common in the Potts Valley. One introduced broom plant was seen on an island in the South Ashburton Gorge, and two in a terrace shrubland of the Potts Valley. Animal pests are affecting many shrublands, particularly possums. A number of possums were seen and their droppings were abundant. Many shrubs were damaged and some had died.

Overall the most dense or diverse shrublands were the least modified. Naturalness varies from L/M –H, though most are M-M/H.



## (5) Wetlands

Red tussock (or hybrids with snow tussock) is found on valley floors, alongside streams, or on the SW edge of the property. *Carex* and *Schoenus* wetlands are found in similar situations, the latter being widespread on hill and moraine slopes, terraces and fans,

e.g. the shady side of Mt Guy. Tarns and kettleholes are concentrated at Spider Lakes, and scattered among the Clearwater moraines.

Diversity is naturally low in dense red tussock. Associated species include *Anisotome aromatica*, *Viola cunninghamii*, *Oreobolus pectinatus*, *Bulbinella angustifolia*, *Sphagnum crisatum* and other mosses. Introduced species include *Juncus effusus*\* and *Juncus articulatus*\*. More often, red tussock occurs as a mosaic with *Schoenus* and *Carex* spp. In these situations, light penetration is greater, and species diversity is higher. Associated species include *Carex sinclairii*, *Schoenus pauciflorus*, *Carex coriacea*, *Drosera arcturi*, *Festuca novae-zelandiae*, *Carex secta* (alongside creeks and open water), *Celmisia gracilentia*, *Potentilla anserinoides*, *Epilobium* spp, *Hydrocotyle sulcata*, and occasionally *Typha orientalis*. *Potamogeton cheesemani* is sometimes present in open water. The threatened plant *Aciphylla subflabellata* was seen in red tussock and damp grassland (see Section 4). Introduced species of these wetlands include *Agrostis capillaris*\*, *Anthoxanthum odoratum*\*, *Holcus lanatus*\*, *Mimulus guttatus*\*, *Hieracium pilosella*\*, *H. praealtum*\* and *Lotus pedunculatus*\*. Crack and pussy willows occur locally. Cattle grazing has opened up some wetlands, pugging the substrate and spreading weeds. OSTD has only occurred peripherally along the SW edge of the property. Overall, the naturalness of most wetlands varies from M-H.

*Schoenus* bogs have a similar species composition, but with additional shrub species such as matagouri, manuka, *Hebe pauciramosa*, *Gaultheria antipoda*, *Coprosma propinqua* and *Coprosma rigida*. Additional herbs noted include *Carpha alpina*, *Ranunculus glabrifolius*, *Ranunculus gracilipes*, *Plantago triandra*, *Gentiana corymbifera*, *Limosella lineata* agg., *Dichondra brevifolia*, and *Luzula rufa*. The threatened plant *Carex tenuiculmis* was found by Nick Head near the northern shoreline of Lake Clearwater (see Section 4). Naturalness in these communities typically varies from M-H. Paddle Hill Valley wetland is within RAP A5, and is characterised by *Carex diandra*, *Carex gaudichaudiana*, *Eleocharis acuta* and *Juncus articulatus*\*.

Ephemeral tarns and kettleholes support specialised turf communities, which often exhibit clear zonation. Prominent species include *Viola filicaulis*, *Carex flaviformis*, *Epilobium komarovianum*, *Euchiton mackayi*, *Plantago triandra*, *Gentiana corymbifera*, *Galium*.aff *perpusillum*, *Pernettya nana*, *Rumex flexuosus* and *Dichondra brevifolia*. Introduced plants are most obvious around the perimeter, especially grasses and *Hieracium pilosella*\*. These habitats are affected by sheep/cattle grazing and trampling, hares, rabbits and occasionally vehicles. One introduced broom plant was seen SE of Spider Lakes. Naturalness varies from L-H, but is usually M/H. RAP H13 contains some tarns and kettleholes, red tussock wetlands and *Schoenus* bogs. Two threatened plants were seen in these communities (see 2.4.2).

The scientific importance of Spider Lakes has been known for many years. They are the basis for RAP H11, and have been reported on by botanists such as Burrows et al 1997 and Johnson 1979. Some of the tarns referred to are on freehold land south of Lake Donne. Burrows et al note the presence of *Selliera radicans* and *Centrolepis minima* here and the variety of tarns and kettleholes, each with a distinctive biota related to water presence, depth and fertility. *Iphigenia novae-zelandiae* is found in the turf vegetation of tarns, kettleholes, cushion bogs and moraine gully depressions. This plant is sometimes present in very large numbers. It is highly likely that further

populations will be present in suitable habitat among the moraines, as many could not be visited in the time available. From the results of this survey, it appears that this area is a major stronghold for the species (Nick Head, pers.comm.). Grid references and brief habitat descriptions for this species are listed in the appendix.

South of the Hakatere-Potts Road, Lambies Stream floodplain is dominated by introduced grasses and hawkweed, while its riparian wetland vegetation is severely grazed and pugged. The large kettlehole (Shingle Pit Tarn) near the road supports a peripheral turf community, with the remainder being exposed dry silt heavily pugged by sheep and cattle. It would support aquatics when it contains water. Across the road Fagans Tarn has little turf vegetation, its perimeter being dominated by browsed *Carex*, *Schoenus*, *Bulbinella*, introduced grasses and localised willows. A roadside fence has bisected the tarn.

## **Subalpine Communities**

### **(1) Short Tussock**

Short tussock is less widespread at this altitude. It is locally prominent where it has been induced from narrow-leaved, or less frequently from slim-leaved snow tussock. It can be locally co-dominant with snow tussock in depleted sites, such as on sunny slopes (see site 1). Species composition is similar to that of montane short tussock and subalpine tall tussock communities. This community is most common on the slopes of the Dogs Range, Dogs Hill and Mt Guy. Naturalness varies from L/M to M. RAP's H13 and A5 contain examples of this community. The threatened plant *Raoulia parkii* is present in this community.

### **(2) Tall Tussock**

These are the most extensive subalpine communities. They are found on Dogs Hill, Dogs Range, upper Paddle Hill Valley, Mt Guy and the upper 'Clearwater moraines'. Narrow-leaved snow tussock is dominant, but slim-leaved snow tussock is present on mountain tops and upper shady slopes.

Naturalness varies from L/M on the depleted lower north-facing slopes of Mt Guy to M/H-H on the upper 'Clearwater moraines'. Most narrow-leaved snow tussock communities are of M or M/H naturalness. RAP's H13 and A5 include examples of this community.

Slim-leaved snow tussock is dominant at upper subalpine levels on the Dogs Range. On localised scree patches among tussockland and dwarf shrublands, specialised plants such as *Ranunculus crithmifolius*, *Lignocarpa carnosula*, *Cardamine bilobata* and *Myosotis traversii* var. *cantabrica* are found.

The threatened plants *Pimelea pseudolyallii* and *Hebe buechananii* are present in these communities, along with *Cardamine bilobata* which is categorised as being 'data deficient'.

### **(3) Shrub and Scrublands**

These communities are most notable in the Ashburton Gorge and at the south end of the Dogs Range. Prostrate shrublands characterise the shady upper slopes of the Dogs Range and Mt Guy.

The largest and most diverse shrub communities are found on moraines, bluffs and talus at the south end of Dogs Range. Lower southern slopes support *Brachyglottis cassinioides*, *Coprosma propinqua*, *Coprosma cheesemani?*, matagouri, *Melicytus alpinus*, *Aristolelia fruticosa*, *Hoheria lyallii*, *Hebe traversii*, *Corokia cotoneaster*, *Chionochloa rigida* and sometimes *Aciphylla colensoi* var. *maxima*. Further up, *Dracophyllum uniflorum*, *Brachyglottis cassinioides* and *Phormium cookianum* are common. Towards the west *Podocarpus hallii* and *Phyllocladus alpinus* become more abundant, with some totara being up to 1.5 or 2m dbh. Associated species include *Griselinia littoralis*, occasional *Coprosma colensoi* and *Myrsine divaricata*, while rocks are festooned with lichens and mosses. Naturalness varies from M/H-H. RAP A5 includes these communities.

On drier north-facing moraines and rocky knolls, shrublands of *Coprosma*, matagouri, *Aristolelia fruticosa*, *Corokia cotoneaster*, kanuka and manuka occur. Narrow-leaved snow tussock and *Fescue* tussock are also widespread. Localised areas are quite degraded from the combined effects of sheep, rabbits, hares and possums. There is a small patch of *Nothofagus solandri* var. *cliffortioides* around one rock outcrop. It includes several mature trees, saplings and seedlings, plus *Corokia cotoneaster* and one *Phyllocladus alpinus*. Approximately 6-10 *Cytisus scoparius*\* (introduced broom) were seen here. The naturalness of these communities varies from M-M/H. RAP A5 includes these communities

Exposed ridges on upper shady slopes of the Dogs Range and Mt Guy support dwarf shrublands dominated by *Dracophyllum pronum*. Other species include *Chionochloa macra*, *Dracophyllum uniflorum*, *Leucopogon colensoi*, *Celmisia spectabilis*, *Anisotome flexuosa*, *Hebe epacridea*, *Raoulia hookeri*, *Hieracium pilosella*\*, *Leptinella pectinata* subsp. *villosa*, *Blechnum penna-marina*, *Leucopogon fraseri* agg., *Gaultheria crassa*, *Ourisia caespitosa*, *Pimelea pseudolyallii* ('range restricted'), mosses and lichens. Naturalness is M/H-H. RAP A5 contains this community.

In the South Ashburton Gorge mixed grey shrublands extend into the subalpine zone. Species composition is similar to the montane shrublands described earlier. Kanuka is abundant on exposed ridges and bluffs, and one Kowhai (*Sophora microphylla*) about 4m high was seen. Naturalness is moderate, but in dense shrubland it increases to M/H.

The only significant shrubweeds were broom associated with mountain beech at the south end of Dogs Range, and occasional *Sambucus nigra*\* in grey shrubland on the north side of Mt Guy.

#### **(4) Wetlands**

The main wetlands are *Schoenus* flushes and bogs on shady slopes of the Dogs Range, Dogs Hill, Mt Guy and the upper Clearwater moraines. Patches of red tussock are found on plateau tops of the Dogs Range and Dogs Hill. There are a small number of tarns and kettleholes associated with upper moraines around the Dogs Range, Mystery Lake being the largest.

On plateau summits most red tussocks appear to be hybrids with narrow-leaved snow tussock. Tussock density is high, and the tussocks themselves are often 1-1.5m high. There is little light penetration and plant diversity is naturally low. Typical species in these wetlands include *Sphagnum crisatum*, other mosses, *Ranunculus gracilipes*, *Schoenus pauciflorus*, *Bulbinella angustifolia*, *Viola cunninghamii*, and exotics such as *Hieracium pilosella*\* and *Agrostis capillaris*\* where grazing has been greatest. Naturalness varies from M-H.

*Schoenus* bogs and flushes support species such as *Sphagnum crisatum*, *Celmisia gracilentia*, *Drosera arcturi*, *Bulbinella angustifolia*, *Euchiton mackayi*, *Viola cunninghamii*, *Anisotome aromatica*, *Oreobolus pectinatus* and sometimes *Leptospermum scoparium*. Most are in excellent condition and naturalness is M/H or H.

The ephemeral tarns are characterised by specialised turf communities. One, at 900m at the south end of the Dogs Range, contained the threatened plant *Iphigenia novae-zelandiae*.

## Alpine Communities

### (1) Tall Tussock

The only alpine tall tussock is on the summit plateau of the Dogs Range. The dominant community found there is slim-leaved snow tussock. Other prominent species include *Dracophyllum pronum*, *Celmisia angustifolia*, *Celmisia spectabilis*, *Poa colensoi*, *Kelleria dieffenbachii*, *Gaultheria depressa*, *Raoulia subsericea*, *Celmisia gracilentia*, *Anisotome flexuosa*, *Pygmea pulvinaris*, mosses and lichens. Species diversity is quite high as tussock cover is around 30%, although locally it may be less or up to 50%. *Hieracium pilosella*\* is locally common and sheep tracks are obvious in places. Naturalness is M-H. On exposed sites sheep grazing has severely reduced *Chionochloa macra* and it has been replaced locally by *Festuca novae-zelandiae*. It should recover in the absence of grazing, as many seedlings are present. This community is present in RAP A5.

### (2) Wetlands

The summit plateau of the Dogs Range supports bogs and associated red tussock. The bogs usually contain patches of open water and prominent species include *Oreobolus pectinatus*, *Abrotanella caespitosa*, *Schoenus pauciflorus*, *Drosera arcturi*, *Ranunculus gracilipes*, *Gentiana corymbifera*, *Anisotome aromatica*, *Plantago triandra* and mosses. Sheep damage is significant in some of the bogs, with uprooted *Oreobolus pectinatus* and *Chionochloa rubra* being heavily grazed. Sheep and hare droppings are widespread, and pugging has exposed some organic soils. This will have aided the spread of *Hieracium pilosella*\* and *Agrostis capillaris*\*. Naturalness is M-M/H, but would improve if stock were removed. RAP A5 includes red tussock and bogs on plateau tops.

## 2.4.2 Flora

The following plants on the property are threatened, uncommon, or of particular interest because of their distribution. The threatened plant ratings come from Molloy et al, 2001.

*Triglochin palustris* – Nationally endangered. Previously seen on the northern shoreline of Lake Clearwater at Map J36 2350900-5732600. Has not been seen in recent years (DOC threatened plant database).

*Myosotis pygmaea* var. *minutiflora* – Nationally vulnerable. Found in turf vegetation at Spider Lakes. This small species may well be present in other similar habitats, but it is very small and rather difficult to see.

*Luzula celata* – Serious decline. Found on the floodplain of the S.Ashburton River. The population appears to be the largest in the Rangitata and S.Ashburton catchments [Lange, 2001].

*Carex cirrhosa* – Gradual decline. Tentatively identified, as it was not in flower. Found in turf vegetation in shallow moraine gully meander near Spider Lakes.

- Iphigenia novae-zelandiae* – Gradual decline. Found at 12 localities in turf vegetation of tarns, kettleholes and gully meanders among moraines.
- Raoulia parkii* – Gradual decline. Found at sites 10 and 11 on fluvioglacial outwash, in degraded tussockland on river terrace in the upper S.Ashburton Gorge, and on exposed moraine ridges between the Dogs Range and Mt Guy.
- Aciphylla subflabellata* – Range restricted. Found in wetlands and damp grasslands on the floodplain of Paddle Hill Creek, at its downstream end.
- Carex tenuiculmis* – Range restricted. Recently recorded by Nick Head (Canterbury Conservancy botanist) in wetland adjacent to the northern shoreline of Lake Clearwater.
- Clematis marata* – Range restricted. Found in shrublands in the S.Ashburton Gorge, Potts Valley, and meltwater gullies of the Clearwater moraines.
- Muehlenbeckia ephedroides* – Range restricted. Found at site 12 on the S.Ashburton River floodplain.
- Pimelea pseudolyallii* – Range restricted. Found among rocky tall tussockland on shady slopes of the Dogs Range and Mt Guy.
- Pterostylis tristis* – Range restricted. Found at sites 10 and 11, and in Paddle Hill Creek valley.
- Centrolepis minima* – Sparse. Recorded previously at Spider Lakes (Burrows et al, 1997).
- Hebe buchananii* – Sparse. Found at site 3, and on shady slopes of the Dogs Range.
- Cardamine bilobata* – Data deficient. Found on upper shady slopes of the Dogs Range and Mt Guy, in small screes.
- Myosotis uniflora* – Data deficient. Recorded by Lange 2001, on the floodplain of the S.Ashburton River.
- Selliera radicans* – Its presence inland is of particular interest, as it is usually associated with brackish coastal habitats. Typical inland habitat includes the turfy margins of lakeshores and tarns.
- Lignocarpa carnosula* – Apparently one of the less common scree plants [Mark and Adams 1995], and not recorded during Heron PNAP survey.
- Pimelea sericeovillosa* – Appears to be at or near its southern limit [Eagle 1982, Mark and Adams 1995, Wilson and Galloway 1993] and was not recorded during Heron PNAP survey.
- Podocarpus hallii*, *Phyllocladus alpinus* – Important components of the original woodlands, but now very uncommon in the east.
- Myrsine divaricata* – This is similarly uncommon, being recorded only once during the Heron PNAP survey, and once by Burrows (1996) in the nearby Cameron catchment.
- Sophora microphylla* – Only seen once in the Ashburton Gorge, and noted by Burrows (1996) as being scarce in the “local region”.
- Kunzea ericoides* and *Leptospermum scoparium* – Occur in several localities on the property, and noted by Burrows (1996) as being scarce in the “local region”.
- Nothofagus solandri* var. *cliffortioides* – Uncommon on the dry side of the district.

## 2.5 FAUNA

### 2.5.1 Invertebrates

The main invertebrate habitats are small streams, open tussock grasslands, shrublands, moraine kettleholes, wetlands and sandy areas with depleted cushion communities. The following key areas are described:

### **Craddock Stream and Spider Lakes kettle-holes**

These areas are located on the SW side of the pastoral lease. Numerous tarns and kettle-holes are found in the moraines of these areas. All of them support a diverse flora of turf plants, and this diversity is also present in their invertebrate communities. Diurnal or daytime moths (*Notoreas simplex*, *Arctesthes catapyrrha* and *Paranotoreas brephosata*), ants, flies, bolder copper butterflies (*Lycaena boldenarum*) and ground beetles were all observed. Many of the invertebrate species collected live on the turf plants that are found in the kettleholes and they are adapted to live in this special micro-environment.

Livestock have trampled and damaged the turf vegetation of the kettle-holes, and rabbits have also damaged the vegetation by digging and browsing. Troublesome weeds like sweet briar, *Hieracium* and broom need to be kept out of the kettle-holes.

The rare grasshopper *Brachaspis* 'lowland' was found at one site near Craddock Stream (J36 23485E 57361N). This species is listed in the Department of Conservation recovery plan (Walker) currently being prepared for short-horned grasshoppers. The plan identifies human influences as a possible cause of for its decline. This site needs to be protected from grazing stock, burning and over-sowing, since these activities promote weeds, habitat loss and lower natural species diversity (Kirkpatrick & Dickinson 1984). The site is the most southern record, as it was not known to occur south of the Rakaia River. The female collected has the same colour pattern as ones collected on Castle Hill pastoral lease (Morris 2001 [b])

### **Paddle Hill Creek**

Paddle Hill Creek is found between Dogs Range and Dogs Hill. Nearly the entire catchment is in the pastoral lease with only the last 1.5 kilometres being beyond the property. It is also the largest stream or creek on the property.

The creek is in excellent condition, and has a variety of habitats (runs, riffles and pools) and substrates (sand and medium size stones). Stock have not disturbed the margins of the creek or its many spring-fed tributaries. A diversity of riparian vegetation is present providing excellent breeding habitat, and refuge, for adult aquatic insects during the day. Sixteen species of caddisfly were collected and many more are likely to be present. Two caddisfly species (*Hydrobiosis chalcodes* and *Psilochorema bidens*) are endemic to the South Island. New Zealand's only dobsonfly (*Archichauliodes diversus*) was collected from the creek. Several species of mayfly were collected from the main creek and its tributaries.

Overall, this creek system has a rich aquatic invertebrate community with damselflies, dragonflies, stoneflies, caddisflies, mayflies, dobsonfly and beetles all being observed.

### **Dogs Range Terraces**

These are found on the S and W sides of the Dogs Range, and include large rock outcrops, talus cones and woody shrubland. Not many invertebrates were seen, as access was difficult and the weather was cold. However, many different habitats were present and the vegetation was in good condition with deep litter suitable for ground living invertebrates. Large mountain toatoa (*Phyllocladus alpinus*) are widespread, and provide excellent habitat for ground living and boring invertebrate communities. Quite a few flying invertebrates were seen flying or sun bathing throughout this area. Many orders of invertebrates were observed and they all

indicate a functional community dominated by native invertebrates. Invertebrate communities should continue to increase here as the shrublands regenerate.

### Wetland Complexes

The Ashburton Lakes wetland complex is nationally important for aquatic invertebrates and waterbirds. Many streams on the pastoral lease flow into the Lake Clearwater wetland complex, and most of the remainder flow into the Paddle Hill Creek wetland complex. This wetland has a rich damselfly and dragonfly fauna. Five species were found: the mountain giant dragonfly/kapowai (*Uropetala chiltoni*), blue damselfly/keekeewai (*Austrolestes colenisonis*), common red damselfly/kihitara (*Xanthocnemis zealandica*), yellow spotted dragonfly ('*Procordulia*' *grayi*) and the ranger dragonfly (*Procordulia smithii*). The yellow and black kapowai is one of New Zealand's largest dragonflies, and is found throughout the eastern South Island. Red tussock invertebrate communities were found in poorly drained sites throughout. The wetlands should maintain themselves in the absence of stock and woody weeds.

The freshwater mussel (*Hyridella*) was observed in a wetland on the SW margin of the property.

Burrows et al (1997) note that Spider Lakes support a high diversity and abundance of aquatic invertebrates. Of special interest was the nostracan *Lepidurus apus viridus* (a rare shrimp) found in several tarns, and the ostracod *Newnhamia fenestrata* which was found nowhere else during the survey. The ephemeral Fagans tarn and Shingle pit tarn straddle the Hakatere-Potts road, and were found to be of scientific importance due to their very diverse desmid flora (Burrows et al 1997).

### 2.5.2 Birds

Several native and endemic birds were seen, including New Zealand falcon/karearea (*Falco novaeseelandiae*), black-backed gull/karoro (*Larus dominicanus*) spur-winged plover (*Vanellus miles novaehollandiae*), pied stilt (*Himantopus himantopus leucocephalis*) and South Island pied oystercatcher (*Haematopus ostralegus finschi*). The NZ falcon is threatened, and categorised as being in 'gradual decline' (Molloy et al 2001).

Tarns or kettleholes provide the main areas of (shallow) open water on the property, and these habitats are used by waders such as pied stilt (*Himantopus himantopus leucocephalis*) and South Island pied oystercatcher (*Haematopus ostralegus finschi*), and waterbirds, especially waterfowl. Burrows et al (1997) noted that approximately one third of all birds recorded during their survey, were found at Spider Lakes, albeit in very low numbers. This highlights its value to birds, with its mosaic of different wetland types. In a wider sense, the wetlands on the property have a collective value as bird habitats too. The Ashburton Lakes are very important to a range of birds, and Lake Clearwater adjoins the property. It can be expected that birds using this habitat and others in the vicinity, will move about using nearby wetlands, including those on Hakatere.

The South Ashburton River floodplain and terraces provide habitat for braided river birds such as South Island pied oystercatcher, pied stilt, black-billed gull (*Larus bulleri*), banded dotterel (*Charadrius bicinctus bicinctus*), black-fronted tern (*Sterna albobristata*) and wrybill (*Anarhynchus frontalis*) (Harrington et al, 1986). Several of these species are threatened. The black-fronted tern is in 'serious decline', the banded dotterel is in 'gradual decline', the wrybill is 'nationally vulnerable', and the black-billed gull is in 'serious decline' (Molloy et al 2001).

### 2.5.3 Reptiles

The common skink (*Oligosoma nigriplantare polychroma*) and McCann's skink (*Oligosoma maccanni*) were seen among tussocklands, while the common gecko (*Hoplodactylus maculatus*) was found under rocks and in talus during the field survey (Steve Harraway, pers.comm).

### 2.5.4 Fish

A fish survey was undertaken on the property using observations and electric fishing at selected localities. These included Paddle Hill Creek, meltwater gully streams on the Clearwater moraines and wetlands on the SW margin of the property. Brown trout were recorded in many creeks and streams, and the only indigenous fish found was the endemic upland bully (*Gobiomorphus breviceps*) in wetlands.

## 2.6 HISTORIC

Hakaterere station originally took in the country between the Rangitata and Ashburton Rivers above Mt Possession. At one time it extended up the Rangitata as far as the Lawrence and to the head of the Ashburton.

Thomas Henry Potts, F.G.P. Leach and Henry Phillips first explored the Ashburton side of Hakaterere in April 1857. Potts took up the land around Lake "Clear Water" and ran it as a cattle property until 1870. In 1894 the run was combined with Mt Possession. This continued until 1911 when the country was divided again into two leases. Today, the run is once again farmed in conjunction with the Mt Possession land.

There is little of historic significance on the property. An old musterers hut at the back of the property could deserve some protection.

## 2.7 PUBLIC RECREATION

### 2.7.1 Physical Characteristics

Substantial areas of the property are of gentle relief and potentially have easy practical foot access. This is especially so adjacent to public roads and above Lake Clearwater. Relief in upper Paddle Hill Creek and the South Ashburton is gentle, though the latter is not as easily accessible – mainly due to several rocky bluffs, screes and dense shrublands. The Clearwater moraines are of moderate slope and again quite accessible, but progress up the Potts Riverbed would not be particularly straightforward. Dense shrublands make river crossings likely, and the water is swift flowing and rather deep in places. The terrace riser is very steep, and dense shrublands make access difficult in places.

The Dogs Range, Mt Guy and Dogs Hill all have moderately steep side slopes and gentle summit plateaux. The bluffs, talus cones and moraine ridges associated with shrublands at the south end of the Dogs Range are quite rugged and very steep in places.

The only other physical impediments to foot access are localised dense shrublands, and some wetlands, though these can still be travelled through.



### **2.7.2 Legal Access**

The Lake Heron and Lake Clearwater roads provide legal access to the property boundaries. The property is quite well traversed by legal roads but these rarely follow formed tracks or practical access routes. The Potts River terrace and Clearwater moraines provide an obvious access route, but a legal road is only present in the upper section. There is no legal road following the vehicle track from the Hakatere-Heron Road to upper Paddle Hill Creek. The legal road line up the South Ashburton Gorge is largely impractical.

### **2.7.3 Activities**

Lake Clearwater is a focus for fishing, boating, windsurfing and passive recreational uses with many people staying at the bach settlement. Birdwatching occurs here, as the Lake supports large numbers of waterfowl, and the threatened southern crested grebe. This activity also occurs on the floodplain of the South Ashburton River, where braided river birds can readily be seen.

There is evidence to suggest 4WD and off road motorbike use along the north side of Lake Clearwater, extending onto the moraines above and to the west. Some tarns and other wetlands have been severely damaged by vehicles.

Tramping and walking occurs in the area with Mt Guy, Mystery Lake and the Dogs Range being likely destinations. Both provide wonderful views of the basin and surrounding mountains. People travel through the property to the upper South Ashburton Valley for more challenging tramping and mountaineering e.g. the Ashburton face of Mt Arrowsmith. This valley can also be accessed via saddles from the Cameron Valley.

Some mountain biking occurs in the area. The ride into the upper South Ashburton valley via Paddle Hill Creek is a long but interesting one. Rides may also be done around Mt Guy and across the lower Clearwater moraines. The ride onto the Dogs Range is very steep.

**PART 3****OTHER RELEVANT MATTERS & PLANS****3.1 Consultation**

Meetings were held with non-government organisations at Christchurch on 25 September 2001 and at Timaru on 26 September 2002. Comments on Hakatere included:

- Spider lakes are important. There should be provision for safeguarding rare plants. Grazing could be allowed to keep exotic grasses out of dwarf native plant zones. There should be an easement from the road to the lakes.
- Mystery Lake is also important for aquatic birds with the lakes being used in a cyclic manner.
- Lake Clearwater needs a buffer around the lake to protect the large tussock wetlands.
- Deerstalkers would like good walking access up the Potts River, vehicle access up the Paddle Hill Creek track to Boundary Stream and walking access up the South Ashburton River from the bridge.
- Lambie Stream is important for fishing. All streams should have marginal strips laid off.

A full report was received from the Federated Mountain Clubs of New Zealand. Recommendations in this report included:

- Protection of all parts of the lease west of the fence-line that is east of Dogs Hill and Mt Guy.
- Foot and mountain-bike access along the vehicle track which climbs onto the crest of the Dogs Range from near the point where the track through Paddle Hill Stream meets Boundary Creek and the South Branch of the Ashburton River.
- Wander-at-will foot access to all parts of the Dogs Range, Mt Guy and the hill country between Paddle Hill Creek and the South Branch of the Ashburton River which are not returned to full Crown ownership as a result of tenure review.
- Foot access from the Hakatere-Potts Road to the Spider Lakes and thence to the eastern flanks of Mt Guy.
- Foot access around the eastern end of Lake Clearwater via the present vehicle track and from there directly onto the southern spurs of Mt Guy.
- Foot access from the Hakatere-Potts Road across the stream draining the western end of Lake Clearwater (i.e. via the current footbridge) and thence to the saddle between the Dogs Range and Mt Guy (to secure legal public foot access to these two upland areas).
- Foot access along the lip of the terrace above the Potts River to provide practical access on up the Potts River as well as to upper boundary of the pastoral lease.
- Foot and mountain-bike access along the vehicle track to Mystery Lake. (FMC would not support this route becoming publicly available for 4WD vehicle use.)

**3.2 Regional Policy Statements & Plans**

Not applicable

### 3.2 District Plans

Hakatere is in the Ashburton District for which there is an operational district plan. The pastoral lease is all within the Rural C zone and the lower country is recognised as an area of outstanding landscape while the higher country is recognised as an area of significant landscape. Part of the Potts River Gorge is noted as a Group One Area of Significant Nature Conservation Value and the Dogs range, the Lake Clearwater/Clearwater Moraines and the Spider Lakes are noted as Group Two Areas of Significant Nature Conservation Value. Most of the lease is above an altitudinal land use line of 900m a.s.l.

For those areas identified as Group One Areas of Significant Nature Conservation Value and/or any land above the Altitudinal Land Use Line the following apply:

- No earthworks shall exceed 30m<sup>3</sup> and/or 50m<sup>2</sup> in any one hectare in any continuous period of 5 years or be located on slopes with an angle of greater than 20<sup>0</sup>
- No clearance of indigenous vegetation shall exceed 100m<sup>2</sup> in area in any one hectare in any continuous period of 5 years, except for the clearance of amenity plantings and vegetation clearance within the “Extensions to the Altitudinal Land Use Line above 900m a.s.l.”
- There shall be no exotic tree planting, except amenity tree planting
- No buildings shall be erected.

For areas identified as Group Two Areas of Significant Nature Conservation Value no clearance of indigenous vegetation shall exceed:

- 5000m<sup>2</sup> in area in any continuous period of 5 years; or
- 500m<sup>2</sup> in area in any continuous period of 5 years, where the average maximum height of the canopy of the indigenous vegetation is greater than or equal to 3m; or
- 500m<sup>2</sup> in area of matagouri in any continuous period of 5 years where the average maximum height of the canopy of the matagouri is greater than or equal to 1.5m; or
- 100m<sup>2</sup> in area of *Chionchloa spp* (tall tussock) in any continuous period of 5 years.

### 3.3 Conservation Management Strategies & Plans

Hakatere is in the Rangitata Unit of the Canterbury Conservation Management Strategy. The Ashburton Lakes are recognised as a distinct entity within the unit and the objectives listed for the lakes are:

- To advocate integrated management of the Ashburton Lakes area to protect their natural and historic resources
- To promote protected status for the Ashburton Lakes and wetlands appropriate to their natural state.

### 3.5 Freshwater Fisheries Plans

Not applicable

**PART 4****MAPS ETC.****4.1 Illustrative Maps****4.1.1 Topo/Cadastral (Attached)****4.1.2 Values (Attached)****4.2 Additional Information*****Iphigenia novae-zelandiae* sites**

1:50,000 map J36:

1. 490332. A small ephemeral tarn west of Craddock Stream. Several patches seen in turf towards the perimeter of the tarn.
2. 550356. A kettlehole on a moraine ridge between Mt Guy and Dog's Range. It consists of turf vegetation with embedded glacial erratics. *Iphigenia* is in several localities near the outside edge of the tarn.
3. 566319. A small *Schoenus* bog degraded by cattle on moraine west of Spider Lakes.
4. 574319. A gently depression/gully between moraine ridges, draining a red tussock wetland mosaic degraded by cattle. Very large numbers (tens of thousands?) of *Iphigenia* in turf vegetation for two or three hundred metres towards Spider Lakes. There is some minor cattle damage.
5. 578315. Lake Donne at Spider Lakes, unclear if freehold? NW corner, in turf heavily trampled by cattle.
6. 583-312. In cattle-trampled turf of a small ephemeral tarn and cushion bog. The site is around 150m NE from the vehicle access track to Spider Lakes.
7. 588-323. The herbarium specimen came from this site - the first major stream gully north of Spider Lakes, that has downcut through the L.Heron fault scarp. *Iphigenia* was concentrated in the meandering gully floor in grassy turf.
8. 580-324. A small patch of *Iphigenia* in turf vegetation of a gentle gully depression/meander, in degraded snow tussock grassland.
9. 580-323. Turf associated with a tiny meandering depression in degraded *Fescue* grassland with matagouri.
10. 580-322. As for site 4.
11. 580-320. Turf in another gully meander, similar to site 4. It appears to be immediately north and parallel to that gully.
12. 580-315. Turf on NE margin of Lake Donne. Cattle have severely pugged the shoreline turf, and introduced grasses are widespread. Unsure if on freehold?

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### **4.3 Appreciation**

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