Toitu te Land whenua Information New Zealand

Crown Pastoral Land Tenure Review

Lease name : CLENT HILLS

Lease number : PC 076

Conservation Resources Report - Part 1

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.

Note: Plans which form part of the Conservation Resources Report are published separately.

These documents are all released under the Official information Act 1982.

April 07

CLENT HILLS PASTORAL LEASE

CONSERVATION RESOURCES REPORT

Department of Conservation

February 2006

CONTENTS

PART 1 INTRODUCTION

This report describes the inherent conservation values present on Clent Hills Pastoral Lease in the Ashburton Lakes Basin, Mid Canterbury. Originally, this lease covered 12,181 hectares, however a major portion of the lease has been purchased by the Nature Heritage Fund and will be managed for conservation purposes by the Department of Conservation. The lease now covers an area of 2182 hectares on relatively gentle country lying between 691m at Lake Heron and 1014m on Ricki Spur. The property is drained by sections of the Gentleman Smith and Clent Hills Streams, with the south-eastern corner feeding into a wetland beside Lake Emily (see attached map).

Clent Hills Pastoral Lease adjoins Castle Ridge Station (freehold) to the south, Mt Arrowsmith Pastoral Lease to the west and public conservation land recently purchased by the Nature Heritage Fund to the north and east. Across Lake Heron is the Upper Lake Heron Pastoral Lease.

The property lies in the Hakatere Ecological District (ED) within the Heron Ecological Region (McEwen, 1987). Heron Ecological Region was surveyed as part of the Protected Natural Areas Programme (PNAP) in the mid 1980s (Harrington *et al*, 1986). There are three areas recommended for protection which border and still have some minor part on the lease – Hakatere 2 (Lake Stream/Cameron Fan/Lake Heron), Hakatere 3 (Swin Fan) and Hakatere 4 (Longman Range). There is a larger portion of Hakatere 5 (Lake Emily) still on the lease.

This report has been compiled from the following field survey reports:

- Plant Communities of Clent Hills Pastoral Lease. Mike Harding, May 2004, 16p + maps and photos.
- Assessment of the Fauna Values Clent Hills Pastoral Lease, Canterbury. Jane Sedgeley, Department of Conservation, Christchurch, May 2004, 14p + maps.
- Clent Hills Pastoral Lease, a report on the Aquatic Fauna Surveys. Scott Bowie, Department of Conservation, Christchurch, May 2004, 7p + photographs + map.
- Invertebrate Assessment of Clent Hills Pastoral Lease. Simon Morris, May 2004, 5p + appendices + photographs + map.

PART 2 INHERENT VALUES: DESCRIPTION OF CONSERVATION RESOURCES AND ASSESSMENT OF SIGNIFICANCE

2.1 LANDSCAPE

2.1.1 Landscape Context

The Clent Hills Pastoral Lease forms an integral part of the Ashburton Lakes/Hakatere Basin, which is a highly recognizable landscape of national significance. The flanks of the surrounding mountain ranges define the basin while the lakes and wetlands emphasize it. This inter-montane basin has been described as "probably the most important lake/wetland complex remaining in the South Island high country" (Harrington *et al*, 1986).

A full landscape survey was not carried out for this report as most of the significant landscape components of the original lease were protected through the Nature Heritage Fund purchase. The landscape context and description have been extrapolated from information on adjoining leases and from the NHF purchase proposal.

2.1.2 Landscape Description

Clent Hills Pastoral Lease forms an integral part of the Ashburton Lakes Basin landscape, characterized by its distinctive glacial landforms. The landscape surrounding and within the property forms a coherent and striking high country landscape. Most of the land within the lease is now developed but still remains part of the wider distinctive landscape.

In aesthetic terms Clent Hills Pastoral Lease exemplifies the qualities that are closely associated with the Ashburton Lakes Basin including:

- The uniformity and simplicity of landform with horizontal sweeps.
- Subtle interlocking landforms that provide an overall sense of space and freedom.

2.2 LANDFORMS AND GEOLOGY

Clent Hills is largely flat or gently sloping country on the basin floor, comprising glacial outwash gravels and till of the St Bernard Formation. These deposits are separated by two glacially-smoothed ridges (Isolated Hill and Ricki Spur) comprising Mesozoic greywacke and argillite of the Torlesse Group (Warren, 1967). The St Bernard Formation comprises moraine and outwash surfaces of the Emily and Lake Heron glacial advances, representing the five most recent advances in this part of the Lake Heron Basin (Mabin, 1984). This part of the property is drained by Clent Hills and Gentleman Smith streams, both of which flow south to the Ashburton River (South Branch).

2.3 CLIMATE

Clent Hills Pastoral Lease is in an area characterised by a relatively cool climate with wide seasonal temperature variation (Tomlinson, 1976). The area is cooler and wetter than the

main Canterbury Plains and snow may lie for several weeks in winter. Predominant winds are from the northwest and are frequently strong. Annual rainfall ranges between 1200 and 1600 mm (Tomlinson, 1976). The area experiences high annual and moderate winter solar radiation and slight rainfall deficits (Leathwick *et al*, 2003).

2.4 VEGETATION

2.4.1 ECOLOGICAL CONTEXT

Clent Hills Pastoral Lease is entirely within the Hakatere Ecological District which is part of the Heron Ecological Region. The area was affected by glaciation until relatively recent times (c. 10000 years ago) (Mabin, 1984). The original vegetation of this part of the Hakatere Ecological District was probably a mixture of scrub, tall tussockland dominated by narrow-leaved snow tussock, short tussockland on valley floors and red tussockland and sedgeland at poorly drained sites (Harrington *et al*, 1986; McEwen, 1987). Patches of beech forest were present in some areas, as indicated by small remnants elsewhere in the district (Harrington *et al*, 1986). Tall scrub dominated by inaka, snow totara and mountain toatoa is likely to have been present on moraines until it was removed by fire approximately 600 years ago (Burrows *et al*, 1990). Mixed scrub is also likely to have been present on rocky slopes and stream beds. Studies in the nearby Rakaia Valley (Burrows and Russell, 1990) suggest that areas of beech forest that may have been present on some lower slopes in the area are likely to have been destroyed by natural (pre-human) and more recent induced fires.

In their analysis of the Level II Land Environments on the property, Leathwick *et al* (2003) propose that Land Environment E4, covering almost all of the property, originally supported mountain totara, mountain toatoa and bog pine. Tall tussockland and short tussockland replaced this vegetation following fire. Small areas of Land Environment N2 are present in the valley between Isolated Hill and Ricki Spur. This land environment originally supported shrubland or short tussockland. A small area of Land Environment K1 is present alongside the Swin River, and a small area of Land Environment K4 present near Lake Emily. The former originally supported short tussockland dominated by fescue tussock and blue tussock, and the latter originally supported red tussockland or sedgeland (Leathwick *et al*, 2003).

The extent to which woody vegetation prevailed in the area prior to human settlement would have been influenced by natural fires. Burrows and Russell (1990) suggest that an area nearby in the Rakaia Valley was affected by five fires over the past 5800 years. Of these, four occurred prior to human settlement. Periodic fires and the harsh valley-floor climate (especially severe frosts) would have discouraged the establishment of forest on lower altitude parts of the property.

2.4.2 INDIGENOUS PLANT COMMUNITIES

The most extensive indigenous plant community on Clent Hills Pastoral Lease is depleted tussockland. This community is present on the Lake Heron moraines and on the slopes of Isolated Hill and Ricki Spur. It is dominated by fescue tussock with scattered narrow-leaved snow tussock and/or red tussock. Dense red tussockland is present in the catchment of Lake Emily, especially in the poorly-drained basins and on surfaces closer to the lake. Depleted short tussockland dominated by fescue tussock is present on uncultivated valley floors. Mixed scrub and shrubland occupy rocky slopes and associated talus. All other areas are dominated by pasture comprising cultivated and irrigated paddocks, frequently separated by shelter belts of pine trees.

Indigenous plant communities are described below (see attached map).

1. Lake Heron Moraine

This is a small area (c. 20 ha) of undeveloped ablation moraine lying east of the Hakatere-Heron Road and south of the area of moraine on the southern shore of Lake Heron. It is part of the landforms deposited after the last Lake Heron glacial advance (Mabin, 1984) and appears to be the only part of this landform surface not protected. It is the only unprotected area on this north-western part of the property that has not been intensively developed.

The area supports depleted short tussockland with scattered plants of narrow-leaved snow tussock and matagouri. Dominant species are fescue tussock (6-25% cover), *Raoulia subsericea*, sweet vernal, browntop, golden speargrass, blue tussock, *Celmisia gracilenta*, *Coprosma petriei* and *Pimelea oreophila*. Other common species present are *Brachyscome longiscapa*, patotara, harebell, *Gentiana montana*, *Geranium sessiliflorum*, catsear, *Brachyglottis bellidioides* and *Ranunculus multiscapus*.

2. Swin River Fan

This area covers the northern portion of the area surveyed, between a pine shelterbelt and the boundary of the property along the Swin River. Landforms are rolling ablation moraine in the western part of this area (near Lake Hill) and an alluvial fan of the Swin River in the eastern part. The western part supports depleted short tussockland with areas of cushionfield in ephemeral tarns in the moraine hollows. The eastern part supports areas of depleted short tussockland, pasture and gravelfield.

Short tussockland on the moraine surface is dominated by fescue tussock (25-50% cover), sweet vernal and browntop. Other common species present are mouse-ear hawkweed, harebell, *Raoulia subsericea*, blue tussock, catsear and *Coprosma petriei*. Less-common species present include *Celmisia gracilenta*, *Pimelea oreophila*, *Stellaria gracilenta*, *Gentiana montana* and *Ranunculus multiscapus*. Scattered through the short tussockland are low plants of matagouri and occasional plants of narrow-leaved snow tussock and red tussock.

Cushionfield in the moraine hollows is dominated by *Gentiana bellidifolia* (in full flower at the time of survey), *Galium perpusillum*, *Epilobium angustum*, *Euphrasia zelandica*, *Coprosma petriei*, *Gnaphalium traversii*, *Potentilla anserinoides* and a small sedge (*Carex* sp.).

Gravelfield on the gentle Swin River alluvial surface is dominated by bare ground and scabweed, mouse-ear hawkweed, storksbill, sandwort, *Scleranthus uniflorus*, *Plantago lanigera*, creeping pohuehue, *Raoulia monroi* and sheep's sorrel.

3. Isolated Hill

This area covers the low northern ridge of Isolated Hill. It is a ridge of glacially-smoothed bedrock with a relatively gentle crest and steeper flanks. The ridge crest, gentler slopes and adjoining valley floor support depleted short tussockland. Steeper rocky slopes on the southwest flank of the ridge support rockland and scrub communities. Small patches of low matagouri scrub are present on the eastern slopes.

Short tussockland on the ridge crest and gentler slopes is dominated by low matagouri (6-25%), fescue tussock (25-50% cover), mouse-ear hawkweed, sweet vernal and browntop. Other common species present are patotara, white clover, *Coprosma petriei*, *Celmisia gracilenta*, *Pimelea oreophila*, *Stellaria gracilenta*, *Geranium sessiliflorum* and *Ranunculus multiscapus*.

Short tussockland is also present as a relatively narrow strip on the floor of Gentleman Smith Valley just west of the ridge and east of the fence separating the area from cultivated paddocks. This diverse community is dominated by fescue tussock (26-50% cover), *Coprosma petriei* and mouse-ear hawkweed. Other common species present are blue tussock, *Pimelea oreophila*, *Stellaria gracilenta*, *Ranunculus multiscapus*, sweet vernal, browntop and low shrubs of matagouri. Also present but less common are patotara, golden speargrass, *Raoulia subsericea*, red woodrush, *Polytrichum juniperinum*, harebell, *Celmisia gracilenta*, *Raoulia hookeri*, *Blechnum penna-marina*, *Gnaphalium* sp., sheep's sorrel, mouse-ear chickweed and white clover. The short tussockland at this site is the healthiest and densest observed on the property.

Scrub on the steeper rocky southwest slopes of the Isolated Hill ridge is dominated by mingimingi (26-50% cover), mountain wineberry, matagouri, porcupine shrub, *Rubus schmidelioides*, *Coprosma intertexta* and scrub pohuehue. Other common species present are native broom, bracken, woolly mullein and gooseberry. Small elder trees are scattered through the scrub.

Open rocky slopes above the scrub support scattered shrubs of mingimingi, matagouri, *Coprosma intertexta*, native broom, porcupine shrub and sweet brier, with blue tussock, fescue tussock, mouse-ear hawkweed, grasses, haresfoot trefoil, patotara, woolly mullein, creeping pohuehue, *Scleranthus uniflorus*, white fuzzweed and *Gnaphalium sphaericum*. Exposed surfaces at the top of the rocky slope support sprawling mats of *Raoulia apicinigra*. Shrubs of prostrate kowhai are present on rock bluffs.

4. Valley East of Isolated Hill

This area was formed by a meltwater channel flowing from the glacier during the Lake Heron 1 advance (Mabin, 1984). The area extends from the property boundary in the south to adjacent to the north end of the Isolated Hill ridge (and adjacent to the summit of Ricki Spur) in the north. Most of this area is cultivated pasture but there is some remnant highly to moderately depleted short tussockland and smaller areas of cushionfield/herbfield (covering 5% of the valley floor).

Short tussockland on a narrow terrace on the eastern side of this area (east of the fence along the base of Ricki Spur) is dominated by fescue tussock (6-25% cover) and mouse-ear hawkweed (51-75% cover). Other common species present are blue tussock, *Pimelea oreophila*, *Coprosma petriei*, sweet vernal, browntop and low shrubs of matagouri. Also present but less common are patotara, harebell, *Raoulia subsericea*, *Celmisia gracilenta* and *Ranunculus multiscapus*.

Cushionfield/herbfield communities are present at exposed terrace-edge sites and in ephemeral tarn or wind-eroded hollows on the valley floor. These areas are dominated by bare ground, mouse-ear hawkweed and species of moss and lichen. Other important species (some of which are occasionally dominant) are sheep's sorrel, sweet vernal, sandwort, *Plantago lanigera*, *Stellaria gracilenta*, *Raoulia monroi*, *Raoulia apicinigra* and *Poa maniototo*. Occasionally present are dwarf or prostrate plants of porcupine shrub and *Hebe pimeleoides* var. *minor*.

5. Ricki Spur

This area covers the western slopes of Ricki Spur. Ricki Spur is a ridge of glacially-smoothed bedrock with moderately steep upper slopes and relatively gentle lower slopes, except in the southwest where the toe slopes are steep and rocky. The southern part of this area comprises a broad ridge crest which becomes part of the Lake Emily catchment described below. The ridge crest and gentler slopes support depleted short tussockland and patches of low matagouri scrub. Steeper rocky slopes on the southwest flank of the ridge support rockland and scrub communities.

Short tussockland communities are similar to those described for the Isolated Hill ridge (above), with the addition of scattered tall tussock (narrow-leaved snow tussock and red tussock) on the southern slopes. Low matagouri scrub is also common in this area.

Scrub on the steeper rocky southwest slopes is dominated by mingimingi (26-50% cover), mountain wineberry, matagouri, porcupine shrub, *Rubus schmidelioides* and scrub pohuehue. Other common species present are *Coprosma intertexta* (occasionally in dense patches), *Olearia bullata*, native broom, *Clematis marata*, sweet brier and bracken. Small elder trees are occasionally present.

Open rocky slopes above the scrub support scattered shrubland-short tussockland-herbfield similar to that described for the southwest slopes of Isolated Hill, including the notable species white fuzzweed and prostrate kowhai. A small patch of manuka is also present on a rocky knoll.

6. Lake Emily Catchment

This area covers the small valleys and adjoining slopes in the catchment of Lake Emily, on the southeast part of the pastoral lease and includes part of RAP Hakatere 5 (Lake Emily). The area supports dense red tussockland at poorly drained sites, depleted fescue tussockland on well drained valley-floor sites and mixed tall tussockland-short tussockland on adjoining slopes.

Dense red tussockland is dominated by red tussock, with inter-tussock spaces dominated by pasture grasses. Also present are *Juncus effusus*, *Schoenus pauciflorus*, matagouri, sweet brier, native broom, *Olearia bullata*, *Hebe venustula*, *Blechnum penna-marina*, sphagnum moss, *Bulbinella* sp., *Carex coriacea* and comb sedge.

Short tussockland in this area is relatively diverse. It is dominated by fescue tussock (6-25% cover), blue tussock (6-25% cover), *Coprosma petriei* and mouse-ear hawkweed. Other common species present are *Raoulia subsericea*, browntop, sweet vernal, catsear, *Brachyscome longiscapa*, patotara, *Gentiana montana*, *Euphrasia zelandica*, *Polytrichum juniperinum*, *Pimelea oreophila*, *Carex breviculmis*, *Celmisia gracilenta*, *Ranunculus multiscapus*, harebell, *Carmichaelia monroi*, *Brachyglottis bellidioides* and occasional golden speargrass.

Mixed tall tussockland-short tussockland on gentle slopes is dominated by red tussock (6-25% cover), fescue tussock (6-25% cover), matagouri, golden speargrass, snowberry, mouse-ear hawkweed, sweet vernal, browntop, *Raoulia subsericea* and catsear. Other common species present are *Pimelea oreophila*, *Leucopogon suaveolens*, *Celmisia gracilenta*, patotara, red woodrush, *Coprosma petriei*, harebell, *Celmisia spectabilis*, *Holcus lanatus*, *Brachyglottis bellidioides*, *Carex breviculmis* and *Euphrasia zelandica*. Occasionally present are scattered tauhinu shrubs.

Cushionfield is present in small ephemeral tarn hollows in this area. This plant community is similar to that described for such sites in the Swin River area, with the addition of *Gentiana grisebachii*.

Herbfield is present within this area along the small ephemeral streams flowing towards Lake Emily. Areas of open (wind-eroded) sand and silt support white clover, sheep's sorrel, creeping pohuehue, *Taraxacum officinale*, *Geranium sessiliflorum*, *Acaena inermis*, *A. caesiiglauca*, *Cirsium arvense* and *Gonocarpus micranthus*. Also present are patches of *Raoulia monroi*.

7. Clent Hills and Gentleman Smith Valleys

This area covers the majority of the property, taking in most of the modified parts of the lease. It borders RAP Hakatere 2 (Lake Stream/Cameron Fan/Lake Heron) with a small area of this being inside the pastoral lease boundary. It comprises most of the gentle valley-floor surfaces on either side of the Hakatere-Heron Road. The glacial and fluvio-glacial landforms in this area have been developed into pasture and are intensively grazed. The area is divided into small paddocks by fences and shelter belts.

Summary

Plant communities on the property that have not been intensively developed (i.e. cultivated) are partly representative of the original vegetation. Of these, scrub, rockland, cushionfield and red tussockland communities are highly representative, short tussockland on valley floors is moderately-highly representative, and short tussockland and tall tussockland on hill slopes and moraines moderately representative. The original (pre-human) vegetation of the area would have been dominated by low-stature (non-woody) plant communities. Remaining indigenous plant communities on the property are not dissimilar in character to those originally present.

Plant communities at lower elevations, especially those on gentle outwash surfaces, in the Lake Heron basin are seriously depleted relative to their former extent. These sites have been favoured for development and most now support cultivated and/or irrigated pasture.

Analysis of the extent to which the Land Environments of the property are represented within existing protected natural areas indicates that less than 10% of Land Environment E4, less than 1% of Land Environment N2, less than 3% of Land Environment K4 and approximately 24% of Land Environment K1 are protected (Department of Conservation, *unpublished data*, April 2004). While these data should be interpreted with caution, they could support the conclusion that undeveloped low-altitude sites on the property are a high priority for protection. However, the environments may now be adequately represented on recently protected adjoining public conservation land

Several notable plant species are present on the property, including four species listed as threatened by Hitchmough (2002) and at least one species that is very uncommon in the area (prostrate kowhai). These species occur in the less-depleted scrub, rockland and valley-floor short tussockland and cushionfield plant communities. It is possible that other threatened or rare species may be present in the ephemeral tarns and silty hollows.

2.4.3 NOTABLE FLORA

Notable plant species observed on Clent Hills Pastoral Lease surveyed are listed in Table 1 below. Threat categories are those proposed by de Lange (2004).

Table 1 Notable plant species, Clent Hills Pastoral Lease, April 2004.

Plant Species	Known Distribution on Property
Gradual Decline	
Raoulia monroi	Relatively common at several locations: Swin River flats, valley floor west of Ricki Spur, and along ephemeral streams in Lake Emily catchment.
Sparse	
Coprosma intertexta	Scattered patches in scrub on lower southwest slopes of Isolated Hill and Ricki Spur.
Data Deficient	
Vittadinia australis	Present on rocky slopes on lower southwest slopes of Isolated Hill and Ricki Spur.
Uncommon in Ecological District	
prostrate kowhai	Present on rock outcrops on southwest slopes of Isolated Hill and Ricki Spur. Not recorded in ED by Harrington *et al* (1986); recorded at only one location in the adjoining Mt Hutt ED (Glenny, 1989).

The abundance of *Raoulia monroi* is notable. This species is present throughout the eastern high country but is normally rare. It is common on the property at sites where soil has been exposed through wind erosion. *Coprosma intertexta* was not recorded in the Hakatere or Arrowsmith ecological districts by Harrington *et al* (1986) or in the adjoining Mt Hutt Ecological District by Arand and Glenny (1990). It is common, and in places co-dominant, in the two areas of scrub surveyed.

2.4.4 PROBLEM PLANTS

Introduced plants that may have an important effect on indigenous plant communities on the property, and that can be controlled or contained, are listed and discussed below. Other ubiquitous naturalised species for which containment or control are probably impractical, such as mouse-ear hawkweed and pasture grasses, are not discussed here but are listed in the vegetation descriptions.

Sweet brier

Sweet brier is present as scattered shrubs throughout tall tussockland and scrub on the property. It is not dominant anywhere and does not appear to be spreading aggressively. Control of this species is desirable but not essential to protect existing conservation values.

Gooseberry

Gooseberry is present in scrub on the southwest slopes of Isolated Hill. It is not dominant in this community but poses a moderate threat to adjoining areas. Removal of this infestation would be desirable, though not essential to protect the conservation values of this site.

Broom

Scattered broom plants are present alongside the Hakatere-Heron Road. A few browsed plants were observed in the area inspected on the southern part of the Lake Heron moraine

just east of the road. Broom is also likely to be present on northern parts of this landform that are already protected. Broom poses a serious threat to depleted short tussocklands in this area. Existing infestations should be removed, and the area monitored regularly for further infestations.

Wilding pines
Scattered wilding pine trees are present alongside the Hakatere-Heron Road and occasionally in the area inspected on the southern part of the Lake Heron moraine just east of the road. Wilding pines pose a serious threat to depleted short tussocklands in this area, and to other plant communities further south and east on the property.

Elder
Small elder trees are scattered through scrub communities on the southwest slopes of Isolated Hill and Ricki Spur. The presence of this species compromise the ecological value of these scrub communities and threatens other areas vulnerable to infestations arising from their bird-dispersed fruits. These infestations should be removed to prevent further spread.

2.5 FAUNA

2.5.1 BIRDS

Bird observations for several locations are grouped into three broad habitat types: wetlands, shrubland and associated rocklands, and cultivated paddocks (see attached map).

Wetlands

Wetlands in two areas of the property were visited. The first was part of an extensive areas of red tussock wetland associated with Lake Emily, and is located in the south-eastern part of the property. The second is located in a cultivated area at the top of Gentleman Smith Stream; it is highly modified by damming and contains little native vegetation.

The wetland associated with Lake Emily was very dry at the time of survey. There was a small stream and few seepages, but very little open water present. The bird fauna observed during this inspection reflected this paucity of open water at this time of year. Southern black-backed gull, spur-winged plover, New Zealand pipit, and Australasian harrier were recorded. Standing water is likely to be present at other times of the year, and the combination of open water and tall tussock will provide good habitat for marsh crake. This threatened species has been recorded in wetlands around nearby Lake Heron.

The piece of wetland assessed during this inspection is an integral part of the whole wetland mosaic associated with Lake Emily. Lake Emily is located outside of the boundary of the area being assessed, but the wetlands are hydrologically linked and form a continuous habitat. Lake Emily itself was not assessed as part of this survey, but its bird values are well known. In addition to the indigenous species listed above the following species have been recorded using the lake and wetlands during annual winter bird counts: southern crested grebe (nationally critical) (maximum count of 5), black swan (considered a native through fossil records), paradise shelduck, New Zealand scaup, black shag (sparse), little shag, black-fronted tern (serious decline), white-fronted tern (gradual decline), grey duck (serious decline), South Island pied oystercatcher, and pukeko (Ornothological Society of New Zealand Ashburton Lakes mid-winter bird survey, 1984–2003, unpublished data).

No birds were recorded in the wetland at the top of Gentleman Smith Stream.

Shrublands and rocklands

Two areas of shrublands and rocklands were assessed, one on the west-facing slopes of Isolated Hill and one on north-west facing slopes to the south of Ricki Spur. Additionally, a small area of rocks on the edge of a tussock wetland in the south-eastern part of the property was assessed.

Grey warbler and silvereye were recorded in the shrublands as well as a range of introduced passerines (Tables 2 & 3).

Cultivated paddocks

The majority of the area assessed was cultivated. Large numbers of paradise shelduck (>100 birds) were recorded in a grazed paddock north-west of Ricki Spur. Spur-winged plover were recorded throughout, and at least 15 banded dotterel (threatened, gradual decline) were recorded in a paddock on the western side of Gentleman Smith Stream. A large number of Canada geese flew over, but did not settle in the paddocks.

Table 2. Indigenous bird species recorded on Clent Hills Pastoral Lease during tenure review inspection, April 2004.

Bird Species Common name	Scientific name	**Known distribution on the property**
Australasian harrier	*Circus approximans*	throughout
banded dotterel	*Charadrius bicinctus bicinctus*	paddock to east of Gentleman Smith Stream
grey warbler	*Gerygone igata*	shrublands south of Ricki Spur; Isolated Hill
New Zealand pipit	*Anthus novaeseelandiae novaeseelandiae*	throughout
paradise shelduck	*Tadorna variegata*	cultivated paddocks
silvereye	*Zosterops lateralis lateralis*	shrublands south of Ricki Spur; Isolated Hill
southern black-backed gull	*Larus dominicanus dominicanus*	throughout
spur-winged plover	*Vanellus miles novaehollandiae*	cultivated paddocks

Table 3. Introduced bird species recorded on Clent Hills Pastoral Lease during tenure review inspection, April 2004.

Bird Species Common name	Scientific name
Australian magpie	*Gymnorhina tibicen*
blackbird	*Turdus merula*
chaffinch	*Fringilla coelebs*
Canada goose	*Branta canadensis*
dunnock	*Prunella modularis*
house sparrow	*Passer domesticus*
redpoll	*Carduelis flammea*
skylark	*Alauda arvensis*
song thrush	*Turdus philomelos*
starling	*Sturnus vulgaris*
yellowhammer	*Emberiza cintrenella*

SUMMARY

A total of 19 bird species were recorded on Clent Hills Pastoral Lease during this inspection: 8 indigenous species (1 endemic species, and 7 native) and 11 introduced. The threatened banded dotterel (gradual decline) was numerous in the cultivated paddocks. Many other bird species are likely to be present in the wetlands at different times of the year, particularly if there is more open water present. The wetland in the south-eastern corner of the property is closely associated with Lake Emily which is rated an outstanding bird habitat. In addition to the 8 species listed above, a total of 11 indigenous bird species (including 5 threatened species) have been recorded on Lake Emily and its associated wetlands during previous bird surveys.

2.5.2 LIZARDS

Lizard observations for several locations are all grouped into one habitat type: shrubland and associated rocklands. Two areas of this habitat type were assessed, one on the west-facing slopes of Isolated Hill and one on north-west facing slopes to the south of Ricki Spur. Additionally, a small area of rocks on the edge of a tussock wetland in the south-eastern part of the property was assessed (see attached map).

The area provided a diversity of lizard habitats including mature and diverse shrubland, rock outcrops, and screes/boulder fields with different sized rocks. Southern Alps gecko, McCann's skink and common skink were recorded (Table 4). The habitat appeared suitable for spotted skink but none were recorded. Because the shrublands were relatively diverse and mature, they may provide suitable habitat for jewelled gecko; however, none were found after an extensive search. This species is often very difficult to find, but the relatively isolated nature of the shrublands may also mean it is not present. The small rocky area in the southern part of the property contained a very high concentration of Southern Alps gecko. More than 20 individuals, including juveniles, were found under a single rock.

Table 4. Lizards observed on Clent Hills Pastoral Lease during tenure review inspection, April 2004.

Lizard species Common name	Scientific name	**Known Distribution on the Property**
common skink	*Oligosoma nigriplantare polychroma*	rocklands south of Ricki Spur; Isolated Hill
McCann's skink	*Oligosoma maccanni*	rocklands south of Ricki Spur; Isolated Hill
Southern Alps gecko	*Hoplodactylus* aff. *macculatus* "Southern Alps"	Ricki Spur, Isolated Hill; edge of Lake Emily wetlands

SUMMARY

Three species of lizard were recorded on Clent Hills Pastoral Lease, Southern Alps gecko, common skink and McCann's skink. These were all in small areas of rocklands and shrublands and the habitat also appears suitable for spotted skink.

2.5.3 Fish

Clent Hills Pastoral Lease lies in the catchment of the Ashburton River. The property is drained by Clent Hills and Gentleman Smith Streams, with the southeast part of the property feeding a wetland above Lake Emily (see attached map).

One of the distinguishing characteristics of this river is the lack of dams. This has two effects on the fish communities. The first is that the fish communities are more likely to have diadromous species present (species with a sea phase in their lifecycle). The second effect is that fish are able to migrate between streams, allowing colonisation of previously dewatered streams.

The New Zealand Freshwater Fish Database contains 51 records (at 2nd April 2004) from the Ashburton River (McDowall & Richardson, 1983). Species recorded from streams near the property are Canterbury galaxias, alpine galaxias, koaro, upland bully, longfin eel, common smelt, brown trout, rainbow trout and brook char. Five freshwater habitats, classified by water source, size and physical character, were observed on the property. These habitats and the fish species recorded are described below.

Ephemeral Systems

Ephemeral systems occur in several places around the property, the largest at the north end of the Lake Emily wetlands; but some near the Swin River wetland, at the north end of the Isolated Hill spur and near the track east of Isolated Hill. They mainly flow through tussocks and mat daisies, but brown top was quite prevalent in the Lake Emily wetland system. All are accessible to stock. Most ephemeral systems were dry at the time of this survey. They are generally less than 300 m^2 in total area with the exception of the Lake Emily wetland area which was upwards of 10 hectares. The systems are generally soil based but cobbles and small boulders were common. As the ephemeral systems were generally dry it is not expected that any will be used by fish as they are isolated from other water sources with the exception of the Lake Emily wetland. This is likely to be used by some of the fish species in the area, including upland bully, Canterbury galaxias and brook char.

Seepages

Seepages occur in a couple of places around the pastoral lease, one near the southern end of Ricki Spur and another near the northern end of the Isolated Hill. The vegetation of seepages is generally introduced grasses intermixed with tussocks, but some shrubs present around the seepage margins. Stock access is available to all seepages. Generally, seepages are between three and eight metres in length, between 300 and 600 mm in width and less than 80 mm in average depth. Seepages are entirely mud based, often pooling in shallow depressions were they again started flowing underground. Two seepages were searched for fish, but none found. It is not expected that these seepages will be used by fish as they receive heavy use by stock and are isolated from other water sources preventing migration into these habitats.

Natural Streams

This habitat was quite sparse on the pastoral lease, with some parts of Clent Hills and Gentleman Smith Streams having small areas of residual natural stream, the Lake Emily wetland having several small enduring streams and some tributary streams. The vegetation differed between sites, Clent Hills and Gentleman Smith Streams were mainly introduced grasses with tussocks around stream margins, but the Lake Emily wetland streams were

predominantly native plant communities, particularly red tussock with some introduced brown top also present. Stock access was generally available to all streams. The streams were mostly about one metre wide and varying from 100 to 600 mm in average depth. The substrate was mainly mud, but some gravels and cobbles were also present. Two sites were surveyed for fish, with brook char found at one and upland bully found at both sites (see Table 5).

Modified Streams

This was the most common habitat on the pastoral lease. Commonly, these were stream channels which had been moved to the edges of paddocks, water races created to move water to needed areas, or existing stream channels deepened to ensure good drainage. The vegetation was introduced grasses with tussocks present along parts of the stream margins, and areas of cropped turnip in some paddocks. Stock access was available to all streams. The streams varied in width from 800 mm to two metres; and in average depths 100 to 300 mm. The substrate was mud and silt, with small areas of gravel present. Four sites were surveyed for fish. Upland bully and Canterbury galaxias were the only species found, upland bully occurring in all sites and Canterbury galaxias occurring in Gentleman Smith Stream only.

Farm Ponds

Several farm ponds were found around the pastoral lease, most associated with existing water courses. A series of five farm ponds were found in the an existing water channel in upper sections of Gentleman Smith Stream, a single pond near Isolated Hill and a pond near the ephemeral tarn at the northern end of Isolated Hill. The farm ponds are vegetated by introduced grasses with some tussocks around the edges. Stock has access to all parts of this habitat type. The farm ponds are about 12 to 15 metres wide, up to 30 metres long and often over one metre in average depth. Farms ponds are generally mud based with a few cobbles present. No farm pond was surveyed for fish, but given their close association with existing waterways, they are likely to contain some of the fish species found locally, including upland bully and Canterbury galaxias.

Table 5: Fish species found on Clent Hills Pastoral Lease, April 2004.

Fish species Common Name	Scientific name	**Known Distribution on Property**
Brook char*	*Salvelinus fontinalis*	Found in some tributary streams of Lake Emily.
Canterbury galaxias	*Galaxias vulgaris*	Most waterways, but mainly in Gentleman Smith Stream.
Upland bully	*Gobiomorphus breviceps*	Found in most water ways on the property

* introduced species

Summary

Freshwater fauna communities were surveyed at six sites on Clent Hills Pastoral Lease. Three fish species were recorded: brook char, Canterbury galaxias and upland bully. None of these are considered threatened. Five different aquatic habitat types were described. These were classified by water source, size and physical character. Three fish species, brook char, Canterbury galaxias and upland bully, were caught during the survey. The distribution

of fish around the pastoral lease is not unexpected as the modifications to the stream channels are likely to have had a significant influence on the occurrences of some fish species.

2.5.4 Invertebrates

Invertebrates were surveyed in several shrubland communities, with the foremost shrublands on the pastoral lease being along the western side of Isolated Hill and a lower western terrace of Ricki Spur. The leaf litter in these areas was thin and provided only a minimum habitat for the ground living invertebrates. However, a large assortment of native invertebrates was observed for this time of year in these shrubland. These included ground beetles, blue blowfly, brown blowfly, spider wasps, spiders, cicada, cockroaches, millipedes and ants. On the shrubland foliage spiders and wasps observed searching for prey or resting in the sun. One *Olearia* sp., *O. bullata*, was recorded from the pastoral lease. A diverse moth fauna is associated with *Olearia* sp. Forty-one species of moths all endemic to New Zealand are known to feed on *Olearia* sp. Of these, 17 species are confined to this host group. Furthermore, the *Olearia* sp. plants are found to have their own complex ecosystems supporting lichens, mosses and algae, which in turn all support their own moth species (Patrick 2000).

Two species of grasshoppers, the common lowland grasshopper and *Sigaus campestris* are established in tussockland. Both are common species and are within their known distribution ranges. The common lowland grasshopper is established throughout all three main islands of New Zealand and *Sigaus campestris* is common in scattered populations, primarily along the east coast of the South Island between Lumsden and Cheviot. Other terrestrial invertebrates observed included crickets, darkling beetles, mountain weta and flatworms.

Aquatic invertebrates were inspected along the length of Gentleman Smith Stream which has been heavily modified. All the natural drainage courses have been rerouted along fence lines and now only hold minimum aquatic invertebrate habitat. These were found to contain fingernail clams, *Potamopyrgus* sp., *Physa* sp., *Sciomyzidae* sp., and *Austrosimulium* sp. Caddisflies, waterboatman, mayflies and beetles were observed in the water races. All waterways on the pastoral lease had an overall low rate of naturalness with a high human disturbance and modification. Several small wetland complexes are established along the southern pastoral lease boundary; however, because of the time of year these wetland complexes were dry and no wetland specialist invertebrates were observed. Only the common insects were seen including grasshoppers, ants and cricket.

2.5.5 Notable Fauna

Table 5 Notable fauna recorded from Clent Hills Pastoral Lease, April 2004.

Animal Species Common name	Scientific name	**Known Distribution on Property**
Gradual Decline		
banded dotteral	*Charadrius bicinctus bicinctus*	Paddocks east of Gentleman Smith Stream

2.5.6 Problem Animals

Introduced animals that may have an important effect on indigenous plant or animal communities on the property, and that can be controlled or contained, are listed and discussed below. Other ubiquitous naturalised species for which containment or control are

probably impractical (such as rodents and mustelids), or domesticated animals that are grazed on the property, are not discussed here; however, the shrublands and rocklands appeared to be fenced off from stock and no stock were observed in the wetlands.

Brushtail possum
Brushtail possum sign was observed at a number of locations on the property. Possums are predators of birds and lizards, as well as foliage browsers. Brushtail possum control is likely to be necessary to maintain conservation values.

Feral cat
No feral cats were seen during this survey, but they are likely to be present. Feral cats are predators of birds and lizards. Cat control may be necessary to protect populations of birds and lizards, especially those in riverbed habitats.

Rabbit and hare
Rabbits and hares were seen in relatively low numbers on the property. Control of rabbits and hares may be required to protect conservation values on the property and on adjoining farmland.

2.6 HISTORIC

Clent Hills Station was first farmed by Francis Leach and John Dudley who took up the license in 1857. By 1860 the station covered the land from the Stour River to the shores of Lake Heron, a total area of 20,000 hectares. In 1918, at the conclusion of World War 1, the government resumed control of the Old Man Range country (approximately 12,000 hectares) and this part of the original station regained the Clent Hills name. The rest of the area had been renamed Barrosa Station by Colonel Neill in 1913.

Clent Hills was taken up by Robert Buick and his brother in 1923. They spent the first three years on the property eradicating rabbits before putting the first stock – 500 hoggets – on to the property in 1926. The homestead was built in 1930 and the Buick family undertook further development before selling the station in 1982. In recent years, the business interests that purchased Clent Hills from the Buick family have provided the farm managers with opportunities to further develop the property.

2.7 PUBLIC RECREATION

2.7.1 Physical Characteristics

Clent Hills Pastoral Lease lies within the 'pastoral' recreation opportunity spectrum (ROS) class in the Recreation Strategy for Canterbury Conservancy (Department of Conservation, 1994). Recent national amendments to the ROS classification system put the pastoral lease within three ROS classes, Backcountry Accessible (Motorized), Front country and Rural. Front country accounts for a small area along the roadside near Lake Heron, with Rural and Backcountry Accessible (Motorized) roughly split equally, Rural generally being nearer the road. The property does provide easy access to the neighbouring ranges, The Arrowsmiths to the west and the Taylor Range to the east.

2.7.2 Legal Access

The Hakatere-Heron Road provides legal access to the property from the Ashburton Gorge Road. There are some legal roadlines crossing the property but they do not follow formed

tracks. Good public access is already provided from the Hakatere-Heron Road through the adjacent protected land to the hill country and the lakes that were once part of the lease.

2.7.3 Activities

There is little recreational activity on the lease. Most of the recreational activity in the area is on the land already protected adjacent to the lease. There is some potential to provide a walking and mountain biking route on the south-western boundary of the lease to give access to land to be protected on the adjoining Mt Arrowsmith lease.