

Crown Pastoral Land Tenure Review

Lease name : MT GERALD

Lease number : PT 010

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.

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

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

August

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MT GERALD PASTORAL LEASE



CONSERVATION RESOURCES REPORT

Department Of Conservation

August 2006

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PART 1 INTRODUCTION

Mt Gerald Pastoral Lease is a 6203 ha property located on the lower western slopes of the Two Thumb Range, at the confluence of the Godley and Macaulay rivers in the Mackenzie Basin, South Canterbury. It covers moderately-steep slopes below 1400 m on the Two Thumb Range and an area of flat to gently-sloping valley floor in the lower Godley valley. The property ranges in altitude from 720 m beside the Godley River to approximately 1400 m on the mid slopes of the Two Thumb Range.

The northern part of the property is drained by the Macaulay River and the lower reaches of a number of its tributaries, notably Ninety Five, Ribbonwood, Stone Hut, First Waterfall, Second Waterfall, Third Waterfall and North East Gorge streams. The southern part of the property is drained by the Godley River and small tributaries of the Godley River (Mount Gerald Creek and tributaries of Coal River). The Macaulay River flows into the Godley River. Access to the property is from State Highway 8 at Lake Tekapo via Lilybank Road.

The southeast part of Mt Gerald Pastoral Lease on the slopes of the Two Thumb Range lies in the Tekapo Ecological District (ED), within Mackenzie Ecological Region (ER). The northeast part of the property, also on the slopes of the Two Thumb Range, lies in Two Thumb ED, within Heron ER. Western parts of the property on the lower range slopes and on the floors of the Godley and Macaulay valleys lie in Godley ED, within Tasman ER (McEwen, 1987). The Tekapo and Two Thumb districts were surveyed in the 1980s as part of the Protected Natural Areas Programme. One area encompassing the catchment of Third Waterfall Stream (Two Thumb RAP 1, Stone Hut Moraine) was recommended for protection by that survey (Harrington *et al.*, 1986). No parts of the property within the Tekapo ED were recommended for protection (Espie *et al.*, 1984). The floor of the lower Godley River valley (The Island) and the beds of the Godley and Macaulay rivers adjacent to the property are listed as Significant Sites of Wildlife Interest (SSWI) and Wetlands of Ecological and Representative Importance (WERI).

The property adjoins Godley Peaks Pastoral Lease and Godley Riverbed Conservation Area (Conservation Land Unit I36005) across the Godley River (UCL) to the west, Lilybank Pastoral Lease across the Macaulay River (UCL) to the northwest, Godley-Macaulay Conservation Area (I36008) to the north in the upper Macaulay valley, Mt Gerald/Two Thumb Conservation Area (I36007) on the slopes of the Two Thumb Range to the east, and Richmond Pastoral Lease to the south, (see attached map).

The tenure review inspection of the property was undertaken during October 2005 and February-March 2006 by a range of specialists. These specialists' reports (listed below) form the basis of this Conservation Resources Report.

- Mt Gerald Pastoral Lease Landscape Assessment, Alan Petrie, October 2005, 7p + photos + map.
- Plant Communities of Mt Gerald Pastoral Lease and Recommendations for Protection, Geoff Walls, March 2006, 15p + maps.
- Assessment of the Fauna Values of Mt Gerald Pastoral Lease, Simon Elkington, *undated*, 14p + maps.
- Mt Gerald Pastoral Lease, A Report on the Aquatic Fauna Surveys, Scott Bowie, May 2006, 17p including photos + maps.
- Mt Gerald Pastoral Lease, Assessment of Invertebrate Values and Recommendations for their Protection, Rowan Emberson and Pauline Syrett, March 2006, 13p + photos + maps.

Insert Topo Map

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

2.1 LANDSCAPE

2.1.1 Landscape Context

The Mackenzie Basin, within which Mt Gerald Pastoral Lease is located, is recognised in the Canterbury Regional Landscape Study (Boffa Miskell and Lucas Associates, 1993) as regionally outstanding, principally due to its scale, sense of spaciousness and the dominance of natural patterns and processes over human intervention.

The three primary landforms of the property are the alluvial outwash flats at the head of Lake Tekapo, the suite of terraces and hummocky moraine on the lower slopes of the Two Thumb Range in the Godley River valley and the constant ice-scoured slopes of the Two Thumb Range in the Macaulay River valley.

2.1.2 Landscape Description

For the purposes of this landscape assessment Mt Gerald Pastoral Lease is divided into four landscape units, principally based on topography, (see attached map). The criteria used to assess and evaluate the landscape values of each unit are based on the following attributes:

- Naturalness: an expression of the indigenous content of the vegetative cover and the extent of human intervention.
- Legibility: an expression of the clarity of the formative processes and how striking these processes are.
- Aesthetic value: the memorability and naturalness of the area, including factors which can make a landscape vivid, such as simplicity in landform, muted colours and fine-textured ground cover.
- Visual values: a sub-set of landscape values which relate to the visibility of a particular landscape or natural feature as seen from public vantage points.

Unit 1, The Island

This unit comprises the alluvial outwash flats on the floor of the Godley River valley below the confluence of the Macaulay River. It is bounded to the east by a low alluvial terrace and on other sides by the open beds of the Godley and Macaulay rivers. A notable feature of The Island is its low relief. It rises less than 40 metres (c.710 to c.750 m) over a distance of more than five kilometres. Meandering watercourses indent the otherwise flat surface.

The Island is dominated by short grassland, sedgeland, remnants of red tussockland and stunted matagouri shrubland. Sedges and red tussock are more common along stream channels. Matagouri forms elongated shrublands along old gravel bars. Two patches of crack willow trees are present at the southern end of the flats.

Landscape Values

This unit contains high inherent landscape values due to the distinctive two-dimensional character of the topography. The lack of vertical elements reinforces the sense of spaciousness and enables unimpeded views of Lake Tekapo from Lilybank Road. In aesthetic terms, the unit conveys a feeling of coherence attributable to the subtle integration of the plant communities and their limited copper-gold-grey colour range.

Potential Vulnerability to Change

Land uses that have the potential to adversely affect this unit are:

- The introduction of structures which detract from the existing two-dimensional character of the alluvial flats.
- Further infestations of crack willow which nullify the existing uncluttered character of the unit.
- Fencing that leads to fragmentation of the existing vegetative cover.
- Uncontrolled four-wheel-drive access that damages the wetlands and ponds.
- Further stock pressure that has an adverse effect on water quality and the fragile margins of the wetlands.

Unit 2, Godley Valley

Description

This substantial unit includes the flight of glacial terraces and lateral moraine on the flank of the Two Thumb Range covering the southeast part of the property. This suite of landforms continues onto the adjoining Richmond Pastoral Lease, south of the property. The glacial terraces lie between c.1000 m and c.1300 m and are relatively constant, except for the incised stream gullies that cross them. The lateral moraine below the terraces features hummocky topography comprising a sequence of low ridges and mounds separated by concave troughs. The surface of the moraine is deeply etched by substantial watercourses such as Ribbonwood Stream and Mt Gerald Creek.

Tall tussockland is dominant on upper slopes, grading down-slope to dense even sward of fescue tussock and pasture grasses. Pasture becomes more conspicuous below c.900 m. Below this, closer to the lower alluvial terraces, there is a belt of dense matagouri scrub. Vehicle tracks traverse the unit, including the upper slopes.

Landscape Values

The upper section of the unit contains high inherent landscape values attributable to the legibility of the glacial landforms, especially the hummocky moraine. The vegetative cover follows uniform patterns with no hard edges. This segment of the unit is an integral part of a larger highly recognizable landscape type that covers the slopes of the Two Thumb Range east of Lake Tekapo. Below c.900 m altitude, the inherent landscape values are generally only moderate due to the disjointed vegetation pattern resulting from the conversion of large areas to extensive farmland.

Potential Vulnerability to Change

Land uses that have the potential to adversely affect this unit are:

- Fencing that leads to fragmentation of the existing coherent tussockland cover on the glacial landforms.
- Tree planting.
- The introduction of structures.

Unit 3, Stone Hut Stream Fan

This small unit comprises the wide alluvial fans of Stone Hut and lower Ribbonwood streams and the adjoining river flats of the Macaulay River. Low terrace risers have been formed in the fan by channels of the streams. The upper limit to the unit is the point near the property boundary where Stone Hut Stream emerges from a confined gorge-like valley.

The upper section of the unit is clad in tall tussockland, with good condition tall tussock on the darker slopes and sparser tall tussock with short tussock and introduced grasses on sunnier faces. Below Stone Hut (c.1000 m altitude) introduced grasses dominate the vegetation. Matagouri shrubland is common further down on the Macaulay River flats. The lower slopes and stable gravel terraces of the upper reaches of Stone Hut Stream are lined with matagouri-*Olearia* shrubland. Crack willow trees are present near Stone Hut. The southern section of the river flats are cultivated and sown in pasture.

Landscape Values

This unit possesses only moderate inherent landscape values principally due to the extent to which vegetation on the alluvial fan and river flats has been modified. The upper gorge-like section of Stone Hut Stream has moderate scenic values due to the presence of mixed shrubland, reaches of white water and an overall sense of containment.

Potential Vulnerability to Change

Land uses that have the potential to adversely affect this unit are:

- Further infestation of Stone Hut Stream by crack willow.
- Conversion of tall tussockland to grassland in the upper catchment of Stone Hut Stream.
- Tree planting.

Unit 4, Macaulay Valley

This unit encompasses the entire west-facing slopes of the Two Thumb Range in the Macaulay valley in the northern part of the property. The upper boundary of the unit is the property boundary at c. 1350 m. The eastern boundary is the Macaulay River and its tributary, North East Gorge Stream. The southern boundary is Stone Hut Stream. The dominant landform is the constant slope that is periodically incised by large streams, notably First Waterfall, Second Waterfall and Third Waterfall streams. A feature of these streams is the waterfalls that cascade from narrow cuts in the base rock. Discontinuous river flats are present along the margins of the Macaulay River.

The composition of the vegetation varies depending on altitude. The upper and mid slopes are dominated by tall tussockland, and the lower slopes are dominated by fescue tussockland and matagouri shrubland. Mixed matagouri-*Olearia* scrub is present on the margins of the larger streams and on the over-steepened toe slopes.

Landscape Values

This unit has high inherent landscape values due to the overall impression of naturalness and the dominance of tussocklands. It forms the visual boundary between the more developed lower country along the Macaulay River (Unit 3) and the less modified northern part of the property. Visual impacts are limited to an upgraded access track. Distinctive and memorable features of this unit are the waterfalls that cascade from the ravine-like gullies.

Potential Vulnerability to Change

Land uses that have the potential to adversely affect this unit are:

- Unsympathetic tracking or other earthworks on prominent slopes.
- Subdivision that fragments the existing vegetation pattern.
- The introduction of structures that compromise the backcountry character.

2.1.3 Visual Values

Mt Gerald Pastoral Lease makes an important contribution to scenic character of the Mackenzie Basin, as the west-facing slopes on the property help define the visual and physical edge of the basin. Mt Gerald Pastoral Lease is most clearly visible from the unsealed Lilybank Road that sidles around the eastern edges of Lake Tekapo and from sections of Godley Peaks Road on the opposite side of the lake. Views of the property from these locations tend to be expansive and panoramic due to the lack of intervening landforms.

From an aesthetic and scenic perspective, the property is an integral part of this regionally important high country landscape; a landscape that features prominently in various forms of media, such as artwork, pictorial calendars and tourist promotions.

A notable feature of Mt Gerald Pastoral Lease is that it is located at a road end where sweeping views of the high country can be experienced. The landscape elements that can be viewed from the road end include:

- The outwash flats of the Godley and Macaulay rivers.
- The medial moraine on Lilybank Station.
- The cultivated river flats that contrast markedly in colour and texture with the adjoining tussock-covered slopes.
- The expansive and distant views of angular mountains that rise abruptly from the broad river flats.

The combination of these elements forms a vivid and memorable image of a quintessential Canterbury high country landscape.

Significance of Landscape Values

The Island (Unit 1) makes an outstanding contribution to the high country landscape. The two-dimensional qualities of this valley floor landscape contrast strikingly with the angular mountains on the surrounding ranges. The northern part of the property (Unit 4) is highly significant as an iconic high country landscape, forming the immediate foreground to a classic Canterbury high country view towards the upper reaches of the Macaulay River. It reinforces the existing wild and scenic qualities of the Macaulay River valley even though the original vegetation has been modified. The mid and upper flanks of the Two Thumb Range (part of Unit 2) make a significant contribution to the coherence and pleasantness of the high country landscape.

Insert Landscape Values Map

2.2 GEOLOGY, LANDFORMS AND SOILS

2.2.1 Geology

The basement rocks of the Two Thumb Range in this area are moderately indurated greywacke and argillite of the Torlesse Group (Chlorite Subzone I) (Gair, 1967). Large parts of the range slopes on the property are covered with hummocky lateral moraine, deposited by successive glacial advances during the Otira (last) Glaciation (Suggate, 1978). The most extensive area of moraine, covering most of the lower western slopes, is attributed to the recent Tekapo ice advance. Moraine on the upper slopes on the southern part of the property (south of Ribbonwood Stream), and an isolated band of moraine on upper slopes on the northeast part of the property, are from the earlier Mt John advance (Gair, 1967). The valley floors of the Godley and Macaulay rivers (including The Island), and the extensive fans of lower Stone Hut and Ribbonwood streams, comprise recently-deposited gravel, sand and silt.

2.2.2 Landforms

Mt Gerald Pastoral Lease is dominated by the moderately-steep slopes of the Two Thumb Range and the relatively extensive gentle beds of the Godley and Macaulay rivers. The range slopes on the northern part of the property (in the Macaulay valley) are glacially-smoothed and dissected by narrow deeply-incised gullies. The range slopes on the western and southern (Godley valley) part of the property are gentler and mantled in extensive hummocky moraine and, again, dissected by stream gullies. The larger streams, notably Stone Hut and Ribbonwood streams have formed large gravel fans in their lower reaches. The wide gravel beds of the Godley and Macaulay rivers, including the more stable section of riverbed within the property (The Island) form an impressive landform. The braided river channels, extensive stable river flats and smaller terraces and fans at the valley edges combine to create a distinct landform which contrasts markedly with the adjoining steep mountain slopes. The mountain ranges and the wide valleys are typical of the extensively-glaciated central Southern Alps.

2.2.3 Soils

Higher altitude parts of the property on the Two Thumb Range have Kaikoura steepland soils and Cass hill soils. Mid altitude slopes have Ohau soils. Gentler lower altitude slopes have Dalgety shallow soils and Mesopotamia deep silt loam. Lower-altitude parts of the property on the floor of the Godley River valley (The Island) have Tasman sandy loams and Dobson shallow soils.

Significance of Geology, Landforms and Soils

The range slopes and wide gentle valley floors on the property are typical of the extensively-glaciated central Southern Alps. The significance of the effects of recent glaciation and subsequent fluvial erosion and deposition are well illustrated by landforms on the property, notably the broad ice-smoothed slopes, the narrow deeply-incised stream gullies, the extensive hummocky lateral moraine, the relatively large fans of the main streams and the wide flat stable river bed on The Island.

2.3 CLIMATE

Mt Gerald Pastoral Lease has a sub-humid mountain climate with cold winters and warm summers. The climate of the area is strongly influenced by the proximity of the main divide of the Southern Alps. Predominant winds are from the northwest, with occasional gales. Snow can affect all parts of the property and lie at higher altitudes for several weeks in winter. Average annual precipitation is over 1000 mm though sustained dry periods can occur (Tomlinson, 1976). The property lies in an area which receives high annual solar radiation and has low average annual water deficits (Leathwick *et al.*, 2003).

2.4 LAND ENVIRONMENTS OF NEW ZEALAND (LENZ)

LENZ is, as described by Leathwick *et al.* (2003): “a classification of New Zealand’s landscapes using a comprehensive set of climate, landform and soil variables chosen for their role in driving geographic variation in biological patterns.” The classification units of LENZ, termed environments by Leathwick *et al.* (2003), aim to: “identify areas of land having similar environmental conditions regardless of where they occur in New Zealand.” The consequences of this are that “LENZ provides a framework that allows prediction of a range of biological and environmental attributes. These include the character of natural ecosystems, the vulnerability of environments to human activity, and the potential spread or productivity of new organisms (Leathwick *et al.* 2003).” Leathwick *et al.* (2003) present the LENZ information at four levels of detail, with level I containing 20 environments, level II containing 100 environments, level III containing 200 environments and level IV containing 500 environments. These LENZ classes are presented nationally to assist use at a range of scales; however, this data should be interpreted with caution, as the predicted extent and suggested vegetation types for each Land Environment (Leathwick *et al.*, 2003) have been extrapolated from limited field data.

In an analysis of the LENZ level IV data, with consideration of the remaining indigenous vegetation cover and the legal protection of these environments, Walker *et al.* (2005) proposed a threat classification for the remaining indigenous biodiversity in New Zealand’s environments based on the two components of vulnerability (likelihood of loss): poor legal protection and risk of loss. This threat classification (Table One) has become the recognised benchmark for the promotion of threatened LENZ conservation.

Table One LENZ threat categories and definitions (Walker *et al.* 2005)

Category	Criterion
Acutely Threatened	<10% indigenous cover remaining
Chronically Threatened	10-20% indigenous cover remaining
At Risk	20-30% indigenous cover remaining
Critically Underprotected	>30% indigenous cover remaining <10% legally protected
Underprotected	>30% indigenous cover remaining 10-20% legally protected
No Threat Category	>30% indigenous cover remaining >20% legally protected

The small area at the eastern edge of The Island is “acutely-threatened”. Other mid- to low-altitude parts of the property are “at risk”. A small area of land is classified as “critically underprotected” on The Island. The rest of the property has a “no threat category”, (see attached map).

Significance of Land Environments

A small area at the eastern edge of The Island is classified as “acutely-threatened”. All other lower-altitude parts of Mt Gerald Pastoral Lease on the floor of the Godley River valley and lower slopes of the Two Thumb Range are “at risk”, except for a small area on The Island which is classified “critically underprotected”.

Insert LENZ Map

2.5 VEGETATION

2.5.1 Ecological Context

Mt Gerald Pastoral Lease lies at the confluence of three ecological districts (McEwen, 1987). The Island and the Macaulay River flats are on the southeast edge of Godley Ecological District (ED), a district of glaciated greywacke mountains and broad valleys. The central and southern parts of the property form the northeast tip of Tekapo ED, which is characterised by lakes and extensive moraines. The remainder of the property, made up of the eastern and northern hill slopes, is within Two Thumb ED, based around a rugged greywacke mountain range with a sub humid climate.

Tekapo ED has been surveyed as part of the Protected Natural Areas Programme (Espie *et al.*, 1984). That survey did not identify any Recommended Areas for Protection (RAPs) on Mt Gerald Pastoral Lease. The Two Thumb ED has also been surveyed as part of the Protected Natural Areas Programme (Harrington *et al.*, 1986). One area, covering the catchment of Third Waterfall Stream (Two Thumb RAP 1, Stone Hut Moraine), was recommended for the protection of an altitudinal sequence and moraine landform.

The original (pre-human) vegetation of the property was probably a mosaic of forest and shrubland at lower altitudes and subalpine scrub and tall tussock at higher altitudes (McEwen, 1987). The forest was probably dominated by mountain totara and mountain toatoa, with considerable amounts of mountain ribbonwood and possibly areas of mountain beech. Low-lying land subject to floods, hard frosts, drought and impeded drainage probably had sedgeland and rushland in swamps, shrubland and low vegetation on stony sites, and areas of red tussockland. Climatic extremes, severe weather events (storms, heavy snowfalls and floods) and natural erosion would have provided a dynamic environment for the vegetation and natural fires may also have had an effect. The area would have been home to numerous birds, including large herbivores such as moa, takahe, South Island goose, kakapo and adzebill. They, and smaller animals such as fruit-eating birds, lizards and insect pollinators, would have had a considerable influence on the vegetation.

2.5.2 Vegetation and Flora

The original indigenous plant communities of Mt Gerald Pastoral Lease are substantially depleted. Some lower altitude parts of the property are modified and now support plant communities dominated by pasture species or low-stature matagouri shrubland, with minor pockets of other indigenous vegetation. The exceptions are The Island and the river flats below Second Waterfall Stream, which still have a predominance of indigenous plants (tussocks, sedges, shrubs and smaller specialist wetland and stonefield species). The stream gullies also contain indigenous vegetation, including remnant trees (notably mountain totara, mountain ribbonwood and mountain toatoa), large speargrass and mature shrubland. Tall tussockland is present at higher altitudes on the west-facing slopes of the Two Thumb Range. The condition and naturalness of the tussockland generally increases with altitude, though there are some higher-altitude sites where pasture species are dominant. These indigenous plant communities are described below for the two distinct parts of Mt Gerald Pastoral Lease.

The Island

This area encompasses the extensive valley-floor flats northwest of the homestead. The flats are alluvial gravels with varying amounts of sandy or muddy soil (deep in places, absent and therefore stony in others). They are flood-prone, are crossed by a network of water channels and have a series of ponds. On the western flank are gentle toe slopes founded on moraine deposits and including several small ponds (some constantly wet, others occasionally dry).

The vegetation varies considerably because of the variation in substrate and degree of drainage. At the northern end and extending about halfway southwards, are stonefields of river-deposited stones and gravel. Where the stonefield is regularly swept by floods are scattered grasses (sweet vernal, browntop, fescue tussock and silver tussock), willow herb (*Epilobium melanocaulon*), creeping pohuehue and mat daisies (mainly *Raoulia australis* and *R. tenuicaulis*). On the older more stable stonefields are complex carpets of indigenous plants specialised for that habitat, including mat daisies (at least three species), creeping pohuehue, *Coprosma petriei*, patotara, *Colobanthus brevisepalus*, *Scleranthus uniflorus*, *Acaena inermis*, *Pimelea oreophila* and a wealth of lichens and mosses. The mosses are dominant in places. Low bushes of matagouri, scattered fescue tussock, sparse exotic pasture plants and mouse-ear hawkweed are also present.

Where there is substantial soil development, but good drainage, the main vegetation is a pasture of sweet vernal and browntop also containing fescue tussock, scattered low matagouri, St John's wort and considerable mouse-ear hawkweed. Indigenous specialist stonefield plants are present throughout this vegetation.

Ponds and channels carrying water are flanked by communities dominated by bog rush, with various other sedges, rushes and grasses. In flowing and standing water are macrophytes including red pondweed, *Myriophyllum triphyllum*, water forget-me-not and water buttercup. Ponds prone to drying up have ephemeral turfs of very small sedges and tiny prostrate plants such as *Galium perpusillum*.

There are extensive damp areas. These are dominated by red tussock, which is accompanied by sedges (bog rush, rautahi and several fine-leaved *Carex* species), various rushes and exotic grasses (especially sweet vernal). There are scattered shrubs of *Olearia bullata* in places, areas in which *Hebe odora* is common and pockets of sphagnum moss.

On the moraine on the eastern side of The Island is a combination of pasture (mainly browntop, sweet vernal and fescue tussock) and matagouri shrubland (including some *Coprosma intertexta* and *Olearia odorata*), with small pockets of red tussock in damp hollows. The ponds there have fringes of bog rush, other sedges, rushes and a scattering of *Olearia bullata*. The southern ponds are quite heavily used by stock and have been modified in places by machine excavation.

There are trees of crack willow and Lombardy poplar planted in places. The willows are spreading along water channels but have been kept largely in check by stock browsing.

Hill Slopes

This area covers the east and north parts of the property which includes the land above 1000 m altitude. It also includes some lower-altitude land: a tongue in mid Ribbonwood Stream, part of the outwash fan system north of Stone Hut Stream and the flats and lower slopes north of First Waterfall Stream. The altitude ranges from c.800 m to c.1400 m. The slopes have distinct benches or terraces of moraine and generally steepen as they rise. They are punctuated by a series of streams, three of which in the north have incised rocky gulch systems with waterfalls at their heads. The vegetation is predominantly tall tussockland with varying amounts of shrubs scattered throughout. There are also areas of dense shrubland and treeland, mostly associated with the streams. The density and health of the tussock cover is generally better at higher altitude and north of Third Waterfall Stream. The condition of the tussock cover appears to have been influenced by grazing pressure, over-sowing and top-dressing. Wilding conifers (larch and pines) are present in the uplands, mostly as saplings and small trees.

Most slopes above 1000 m have tall tussockland dominated by narrow-leaved snow-tussock. Slim snow-tussock is also present and assumes dominance on most slopes above 1200 m. Fescue tussock is common and is dominant in some places where the tall tussock has largely gone due to grazing, forming areas of short tussock grassland. Shrubs are scattered throughout and include matagouri,

tauhinu, porcupine shrub, turpentine shrub, dwarf inaka, coral broom, mountain heath, snow totara, several *Hebe* species and localised patches of low-growing manuka. Other indigenous plants, growing between the tussocks and beneath the shrubs, include golden speargrass, patotara, bracken, feathery tutu, the mountain daisies *Celmisia lyallii*, *C. gracilentata* and *C. angustifolia*, *Brachyglottis haastii*, *B. lagopus*, *Carmichaelia vexillata*, cushion broom, snowberry, *Gaultheria crassa*, *Pernettya nana*, *Pentachondra pumila*, *Pimelea oreophila*, *Hebe pimeleoides*, *H. buchananii*, *Coprosma petriei*, blue tussock, *Gentianella corymbifera*, grassland buttercup, woolly head, red woodrush, harebell, *Euphrasia zelandica* and mat daisies (*Raoulia subsericea* and *R. australis*). Lichens and mosses are common. Exotic plants include mouse-ear hawkweed, St John's wort, sweet vernal, browntop, purging flax, sheep's sorrel and occasional wilding larch and pines.

There are small damp hollows on the glacial moraine benches, invariably with a turf dominated by comb sedge and containing sundew, small sedges and various small indigenous herbs.

The southern gullies (Mount Gerald Creek, Ribbonwood Stream, Stone Hut Stream and several smaller streams) are generally bouldery and filled with mature shrubland dominated by matagouri but with much *Olearia odorata*, mountain wineberry, *Coprosma propinqua* and tauhinu and lesser amounts of porcupine shrub, *Olearia cymbifolia*, *O. nummularifolia*, turpentine shrub, *Coprosma intertexta* and *Hebe subalpina*. Golden speargrass, giant speargrass and narrow-leaved snow-tussock are common and Ribbonwood Stream is distinguished by a large population of mountain ribbonwood. Stone Hut Stream has several large crack willow trees below the hut and some sweet brier. In Ribbonwood Stream and Stone Hut Stream the mature shrubland extends down onto the gentler fans.

The northern gullies (First Waterfall, Second Waterfall and Third Waterfall streams) are very different. They are rugged rocky gulches fed by waterfalls, and consequently have not suffered from fire and stock impact as much as the adjacent land. They therefore constitute refugia and retain elements of the original forest cover. Most significant is the abundance of mountain totara (large old gnarled trees and numerous progeny) in Third Waterfall Stream and a small group in Second Waterfall Stream. Also present are mountain toatoa (one tree at the waterfall in First Waterfall Stream), broadleaf (a few in Second Waterfall Stream), mountain ribbonwood (lower Third Waterfall Stream) and mountain akeake (abundant in First Waterfall Stream). The vegetation otherwise is densely shrubby and contains matagouri, *Olearia odorata*, mountain wineberry, *Coprosma propinqua*, *Coprosma intertexta*, tauhinu, porcupine shrub, *Olearia cymbifolia*, *O. nummularifolia*, *Brachyglottis cassinioides*, *Hebe subalpina*, *H. traversii*, golden speargrass, giant speargrass and narrow-leaved snow-tussock. On the sheer rock are plants of snow totara, *Helichrysum intermedium*, *Hebe buchananii* and *Exocarpus bidwillii*, with some *Celmisia semicordata* on shaded faces.

The river flats below Second Waterfall and Third Waterfall streams are just elevated enough to be largely out of the reach of floods. Gravelly places on the margins kept open by floods have a sparse vegetation of mat daisies (mainly *Raoulia australis* and *R. tenuicaulis*), creeping pohuehue, *Epilobium melanocaulon*, fescue tussock and silver tussock. Stable dry ground has a cover of browntop, sweet vernal, *Leptinella serrulata*, fescue tussock and silver tussock, with scattered shrubs (matagouri, *Olearia odorata* and porcupine shrub), mouse-ear hawkweed and many small indigenous ground plants. Damp hollows and stream margins have dense vegetation of bog rush, rautahi, fescue tussock, silver tussock and various smaller sedges and rushes. A small population of the reddish sedge *Carex tenuiculmis* is also present. There is a lone crack willow tree and some *Carex ovalis* (an exotic sedge).

Just downstream of the flats on the riverbank is a mature shrubland of matagouri, *Olearia odorata*, *Coprosma propinqua*, *Coprosma intertexta* and mountain wineberry.

Notable Flora

Notable plant species recorded on the property are listed in Table Two below. Threat categories are those proposed by de Lange *et al.* (2004).

Table Two Notable plant species from Mt Gerald Pastoral Lease, March 2006.

Plant species	Threat status	Distribution on property
<i>Carex tenuiculmis</i>	Sparse	Swampy flats at the mouth of Second Waterfall Stream.
<i>Carmichaelia crassicaule</i> (coral broom)	Gradual decline	Higher altitude slopes (uncommon).
<i>Carmichaelia vexillata</i>	Gradual decline	Common on dry hill slopes.
<i>Leptinella serrulata</i>	Gradual decline	On lower terraces and slopes
Significance		
<i>Coprosma intertexta</i>	Locally uncommon	In gullies and on river banks.
<i>Griselinia littoralis</i> (broadleaf)	Locally uncommon	Second Waterfall Stream.
<i>Hebe buchananii</i>	Locally uncommon	On slopes (uncommon).
<i>Hebe</i> aff. <i>pimeleoides</i>	Locally uncommon	On slopes (common in places).
<i>Hoheria lyallii</i> (mountain ribbonwood)	Locally uncommon	Strong population in Ribbonwood Stream; present in Third Waterfall Stream.
<i>Olearia bullata</i>	Locally uncommon	In damp places (sparse).
<i>Phyllocladus alpinus</i> (mountain toatoa)	Locally uncommon	A single tree in First Waterfall Stream gully.
<i>Podocarpus hallii</i> (mountain totara)	Locally uncommon	Second Waterfall Stream; Third Waterfall Stream.

Significance of Vegetation and Flora

Indigenous plant communities on higher-altitude parts of Mt Gerald Pastoral Lease (generally above 1000 m) at the north and east of the property, have significant inherent values. These areas, mainly of tussockland, are representative, or have components that are representative, of the original vegetation, have high naturalness values and support populations of threatened plant species (coral broom and *Carmichaelia vexillata*). The rocky gorges of the main streams are refuges for remnant original forest species, including mountain totara, mountain toatoa, mountain ribbonwood and broadleaf. Swampy river flats at the mouth of Second Waterfall Stream also retain elements of the original vegetation, including a population of the threatened sedge *Carex tenuiculmis*. The lower reaches of Stone Hut Stream and the adjacent stream to the north have extensive mature indigenous shrublands, and Ribbonwood Stream has a highly distinctive riparian population of mountain ribbonwood.

The Island has significant inherent values. These include stable stonefield communities dominated by low growing indigenous plants, red tussockland in damp sites and indigenous wetland vegetation in ponds and channels.

Insert Botanical Values Map

2.5.3 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.

Gorse

The only infestation of gorse seen on the property was a few bushes at the confluence of Ninety Five and Ribbonwood streams. Gorse poses a potential threat to stonefield and tussockland communities on The Island and to higher-altitude shrubland and tussockland.

Broom

Small infestations of broom were seen on the property associated with low-altitude tracks. Broom poses a potential threat to stonefield and tussockland communities on The Island and to higher altitude shrubland and tussockland.

Wilding exotic conifers

A scattering of wilding exotic conifers (larch and pine) was seen on the property, mostly in the higher-altitude tussockland. Other wildings were seen on neighbouring public conservation land. Plantations of exotic conifers occur around Mt Gerald Station, Lilybank Station and along Lilybank Road, providing potential seed sources. A substantial though not large effort would be required to remove trees from upper slopes on the property and ongoing monitoring and control will be necessary to keep higher-altitude parts of the property free of wilding tree spread. The stonefield, grassland and shrubland communities on The Island are also vulnerable to wilding exotic conifer invasion, particularly if grazing is removed.

Crack willow

Crack willow trees occur along waterways on The Island, below the hut in Stone Hut Stream and occasionally on the Macaulay River flats. They are currently kept in check by grazing. These trees pose a considerable threat to downstream riparian and wetland areas.

Lombardy poplar

Lombardy poplar trees are planted in small discrete pockets on The Island. They are currently kept in check by grazing.

Sweet brier

Sweet brier is widespread on the property. It is locally common and is likely to be long persistent. It is unlikely to have a significant effect on ecological values.

St John's wort

St John's wort is widespread and common on the property. It is particularly prevalent in this part of the country, but does not appear to present a significant ecological threat.

2.6 FAUNA

2.6.1 Bats

Short-tailed bats have not been recorded in Canterbury since the arrival of Europeans. A small population of South Island long-tailed bat is present in South Canterbury. The closest bat records to Mt Gerald Pastoral Lease are from the Tengawai River (Sedgeley, 2002). The property was not surveyed for bats because bat roosting and feeding habitats (forest and mature shrubland) are not present in the area.

2.6.2 Birds

Bird populations of the Godley River valley are typical of those in the large central Southern Alps valleys with high mountain ranges, wide braided rivers and associated wetlands. The braided rivers of the Godley and Macaulay are home to a range of specialised bird species that have adapted specifically to utilise this internationally rare habitat type. These braided rivers and the associated habitats on The Island provide particularly important breeding and feeding habitats for black stilt (threat status: nationally critical). Bird populations in this area (especially black stilt populations) have been closely monitored for a number of years by the Department of Conservation as part of Project River Recovery. The Island is near the northern limit of the breeding range of black stilt. Nine other threatened bird species utilise these habitats: banded dotterel (gradual decline), black-billed gull (serious decline), black-fronted tern (nationally endangered), black shag (sparse), Caspian tern (nationally vulnerable), grey duck (nationally endangered), marsh crake (sparse), New Zealand falcon (gradual decline) and wrybill (nationally vulnerable).

Other birds regularly reported from the Godley River delta, at the head of Lake Tekapo, are New Zealand scaup, Australasian crested grebe (nationally endangered), bar-tailed godwit and chestnut-breasted shelduck. The Australasian bittern (nationally endangered) has not been recorded from the property, although there appears to be suitable habitat in the wetlands on The Island and it has been recorded from Godley Peaks Pastoral Lease across the valley.

The paucity of forest on this property means there are no forest birds of note, but common bush birds such as South Island fantail, grey warbler and silvereye occur both here and on neighbouring properties. South Island tomtit and South Island rifleman (gradual decline) are occasionally seen in scrub on the other side of the Godley valley. Kea (nationally endangered) and rock wren (nationally vulnerable) are present in the mountains west of Mt Gerald Pastoral Lease.

The Godley and Macaulay rivers, including The Island, are classified as Sites of Special Wildlife Interest (SSWI) (Jarman, 1986) and Wetlands of Ecological and Representative Importance (WERI). They provide “outstanding” habitat for a range of wetland bird species (Jarman, 1986). These habitats are among the best examples of their type in New Zealand, are relatively unmodified and not well represented outside Canterbury. They are large, have diverse microhabitats and water bird fauna and contain viable populations of most species typical of these habitat types.

Birds observed on Mt Gerald Pastoral Lease are described below for the three main parts of the property.

The Island

This area lies between Lilybank Road and the Godley and Macaulay rivers. It includes wetland habitats, dry grassy ridges, matagouri dominated shrubland and areas of recently-deposited river gravel. Within the wetland zones there are extensive bog rush-dominated rushlands, marshy areas of red tussockland, deep spring-fed streams and tarns. A wide range of indigenous and introduced bird

species are found on The Island due to the variety of habitats here and on the adjoining braided river beds and Godley River delta.

Threatened bird species observed here during the survey were a pair of black stilts at a tarn, one wrybill feeding around the edge of a tarn, eight black-fronted terns feeding over wetlands, two black shags feeding in one of the deep spring-fed streams, more than 20 banded dotterels feeding around the tarn edges, four grey ducks feeding in tarns and streams throughout the wetland. Three New Zealand falcons were seen in the area. Other indigenous birds seen in the wetlands were Australasian harrier, Australasian pied stilt, little shag, New Zealand pipit, paradise shelduck, pukeko, silvereeye, southern black-backed gull, spur-winged plover, welcome swallow, grey teal, New Zealand shoveler, and white-faced heron. Fifteen naturalised bird species were recorded in this area. The Island provides high quality habitat for a diverse and representative range of wetland birds, 23 indigenous species have been recorded from this area.

Macaulay Valley

This area covers the northern part of the property in the Macaulay Valley, north of and including First Waterfall Stream. The incised stream gullies support low-forest, shrubland, talus and rockland habitats. Intervening slopes support tall tussockland, short tussockland and shrubland habitats. Indigenous bird species observed in the shrublands were South Island fantail, grey warbler and silvereeye. Australasian harrier, New Zealand pipit and New Zealand falcon were recorded from adjoining tussockland habitats. The stream gullies appear to provide suitable breeding habitat for New Zealand falcon. Eight introduced bird species were recorded from this area.

Godley Valley

This area covers the main southern part of the property on the slopes of the Two Thumb Range. The stream valleys support shrubland and tussockland habitats. Adjoining slopes support tall tussockland, short tussockland, grassland and shrubland habitats. Indigenous bird species observed in shrublands were South Island fantail, grey warbler and silvereeye. Australasian harrier, spur-winged plover, New Zealand pipit and New Zealand falcon were observed in the open habitats. Thirteen naturalised bird species were recorded from this area.

Bird Species Recorded

Forty-three bird species were recorded on Mt Gerald Pastoral Lease (40 in February-March 2006 and three additional species prior to the survey (S Elkington, unpublished reports, 1987 – 2003); 26 indigenous species and 17 naturalised species. Ten threatened species were recorded. Threat categories are those proposed by Hitchmough and Bull (*in press*).

Table Three Indigenous bird species recorded from Mt Gerald Pastoral Lease.

Bird species	Threat status	Distribution on property
Australasian harrier	Not threatened	Throughout.
Australasian pied stilt	Not threatened	The Island.
banded dotterel	Gradual decline	The Island; Godley and Macaulay rivers; grassland and tarns.
black-billed gull*	Serious decline	The Island; Godley and Macaulay rivers.
black-fronted tern	Nationally endangered	The Island; Godley and Macaulay rivers.
black shag	Sparse	The Island; Godley and Macaulay rivers.
black stilt	Nationally critical	The Island; Godley and Macaulay rivers.
Caspian tern	Nationally vulnerable	The Island; Godley and Macaulay rivers.
grey duck	Nationally endangered	The Island; Godley and Macaulay rivers.

grey teal	Not threatened	The Island
grey warbler	Not threatened	Scrub and shelterbelts throughout.
little shag	Not threatened	The Island; Godley River.
marsh crake*	Sparse	The Island.
New Zealand falcon	Gradual decline	Throughout.
New Zealand pipit	Not threatened	Throughout.
New Zealand shoveler	Not threatened	The Island.
paradise shelduck	Not threatened	The Island; Godley and Macaulay rivers; grassland and tarns.
pukeko	Not threatened	The Island.
silvereve	Not threatened	Scrub and shelterbelts throughout.
southern black-backed gull	Not threatened	Throughout.
South Island fantail	Not threatened	Scrub and shelterbelts throughout.
South Island pied oystercatcher*	Not threatened	The Island; Godley and Macaulay rivers; grassland and tarns.
spur-winged plover	Not threatened	Throughout.
welcome swallow	Not threatened	Throughout.
white-faced heron	Not threatened	The Island; Godley and Macaulay rivers.
wrybill	Nationally vulnerable	The Island; Godley and Macaulay rivers.

* recorded prior to the survey.

Naturalised bird species observed on the property were Australian magpie, blackbird, black swan, Canada goose, chaffinch, chukor, dunnock, goldfinch, greenfinch, house sparrow, mallard, redpoll, rock pigeon, skylark, song thrush, starling and yellowhammer.

Significance of the Bird Fauna

The Island provides nationally important habitat for indigenous bird species. Ten threatened species were recorded from habitats in this area, including black-fronted tern (nationally endangered), black stilt (nationally critical), grey duck (nationally endangered), Caspian tern (nationally vulnerable) and wrybill (nationally vulnerable). The Island forms a significant part of an SSWI and WERI site which provides outstanding habitat for birds. The incised stream gullies on the property, especially First Waterfall, Second Waterfall and Third Waterfall streams provide important shrubland and low-forest habitats for indigenous birds in an area where much of the original woody vegetation has been lost. The property adjoins, buffers and complements extensive areas of open riverbed habitat in the Godley and Macaulay valleys and mountain habitats on the Two Thumb Range.

2.6.3 Lizards

The Department of Conservation's Herpetofauna Database contains no records of lizards from Mt Gerald Pastoral Lease. Three species of common lizards have been recorded from the adjoining Richmond Pastoral Lease: Southern Alps gecko, common skink and McCann's skink. Three threatened species of lizard have been recorded further south, on Mt Hay Pastoral Lease: scree skink (gradual decline), long-toed skink (gradual decline) and spotted skink (gradual decline). Green skink (gradual decline) and jewelled gecko (gradual decline) have been recorded from the upper Tekapo River. The recently discovered Rangitata skink (data deficient) has been recorded from the Rangitata Gorge, northeast of the property.

Mt Gerald Pastoral Lease supports relatively extensive areas of suitable lizard habitat, though few lizards were observed during the survey. Southern Alps gecko and common skink were recorded in talus-shrubland habitats on the northern part of the property. Southern Alps gecko, McCann's skink and common skink were recorded in boulders alongside the vehicle tracks on the south eastern part of the property. All three species are common and are not threatened.

Significance of Lizard Fauna

Mt Gerald Pastoral Lease provides extensive areas of suitable habitat for lizards, including habitat that is potentially suitable for threatened species. Three common species of lizard were recorded from the property. Talus and shrubland in the incised stream gullies appears to provide the most important habitat for lizards on the property. Lizard habitats on the property are contiguous with extensive areas of intact habitat on adjoining protected lands and pastoral leases.

Insert Bird and Lizard values map

2.6.4 Freshwater Fauna (fish and invertebrates)

The northern part of Mt Gerald Pastoral Lease is drained by the Macaulay River and the lower reaches of a number of its tributaries (Ninety Five, Ribbonwood, Stone Hut, First Waterfall, Second Waterfall, Third Waterfall, Two Thumb and North East Gorge streams). The southern part of the property is drained by the Godley River and parts of its tributaries (Mount Gerald Creek and Coal River). The Macaulay River flows into the Godley River and both flow to Lake Tekapo in the Waitaki River catchment. The Godley River runs along the western boundary of the property, and the Macaulay River runs along the northwest boundary. The extensive wide gravel beds of the two rivers adjoining the property are Unallocated Crown land (UCL).

One of the distinguishing features of the Waitaki Catchment is the presence of hydroelectric dams. This has two major effects on fish communities. The first is that fish communities upstream from the dams are generally composed of only non-diadromous species (those species without a marine phase in their lifecycle), although some exceptions do occur (e.g. longfin eel may still be present and common bully and koaro have become non-diadromous substituting lakes for the sea). The second effect is that fish communities are separated into discrete populations preventing re-colonization of previously dewatered streams.

The New Zealand Freshwater Fish Database (NZFFD) has 891 records from the Waitaki River catchment (at 5th of May 2006). Species recorded from rivers and streams near the property are longfin eel, alpine galaxias, Canterbury galaxias, koaro, upland longjaw galaxias, common bully, upland bully, rainbow trout and brown trout. Two of these species are considered threatened by Hitchmough and Bull (*in press*): longfin eel (threat status: gradual decline) and upland longjaw galaxias (gradual decline).

Mt Gerald Pastoral Lease comprises two main geographic areas of freshwater habitat, classified by physical character and location. Freshwater habitats and the fish and macro-invertebrate species recorded are described below for each of these areas.

The Island

This area comprises the low-lying flats on the floor of the Godley River valley and the adjacent lower hill slopes. It is characterised by extensive river flats with ephemeral tarns, springs, meandering streams and some larger river channels. Riparian vegetation includes rushland, sedgeland, red tussockland, grassland, small areas of shrubland and in some areas, introduced crack willow and poplar trees. Ephemeral tarns have turf communities at their margins. Stock and wild animal access is unrestricted. Vehicle tracks traverse parts of the area.

Waterways vary from about three metres wide in the smaller streams to more than 10 metres wide in larger streams at the southern end of the area. The wetlands are interspersed with the other habitats, creating a mosaic of habitat types. The channel of the Macaulay River that flows through the northeast corner of the block is approximately nine metres wide. Most waterways are 100 to 500 mm deep, although pools more than a metre deep occur in some areas. Stream substrates vary from cobble and gravel in the river-fed sections to mainly mud-based in the spring-fed streams.

Seven sites were electro-fished in this area: four in channels fed from the Macaulay River, two in spring-fed streams and one in a large stream flowing from the adjoining hill slopes. Brown trout were found at six sites, koaro at five sites, upland bully at five sites, rainbow trout at four sites and alpine galaxias at two sites. Two sites on The Island, the main stream and a channel of the Macaulay River, support diverse fish faunas comprising populations of three indigenous species (alpine galaxias, koaro and upland bully). Additional species recorded in the NZFFD from this area are longfin eel, Canterbury galaxias, upland longjaw galaxias and common bully.

The less modified wetlands support a diverse and representative invertebrate fauna including species of aquatic bugs, damselflies, caddis flies, aquatic two-winged flies, marsh beetles and water scavenger beetles. The survey was late in the season and the wetlands were uncharacteristically dry and heavily grazed by cattle. Normally present would be dragonflies, mayflies and diving beetles. The channels of the Macaulay River support a streamside fauna of small ground beetles. A population of the uncommon large scavenger water beetle, *Limnoxenus zealandicus*, usually found in muddy weed-choked ponds, was found aestivating under rocks by a dry tarn.

Macro-invertebrates recorded in this area were: *Coloburiscus humeralis*, *Deleatidium* spp., *Stenoperla prasina*, *Aoteapsyche* sp., *Hydrobiosis* sp., *Hydropsychidae* sp., *Olinga feredayi*, *Pycnocentria* sp., *Pycnocentroides aeris*, *Archichauliodes diversus* and *Elmidae* sp.

Two Thumb Range

This area comprises the flanks of the Two Thumb Range on the property. It is characterised by moderately steep slopes with deeply-incised streams, occasional ephemeral streams and some small wetlands and tarns. All the main streams were flowing for their entire length at the time of survey, except for Ribbonwood Stream which was dry in its lower reaches. The Macaulay River and North East Gorge Stream flow along the edge of this area. The riparian vegetation is stonefield (riverbed) along the Macaulay River and North East Gorge Stream, scrub and low-forest in the incised gullies, and tussockland, grassland, shrubland and occasionally turf communities along the ephemeral and lower-altitude streams and tarns. Stock and wild animal access appears unrestricted, though gorged parts of the deeply-incised streams are largely inaccessible.

The Macaulay River is between 20 and 40 metres wide, although the actual riverbed is much wider. North East Gorge Stream is approximately 12 metres wide, also with a wider stream bed. The incised streams are between two and five metres wide, except for Mount Gerald Creek which is approximately one and a half metres wide. The ephemeral wetlands and tarns are generally each less than one hectare in extent. The Macaulay River varies in depth from about 300 mm in rapids to over one metre in pools. North East Gorge Stream is about 200 mm deep with pools over 500 mm deep. The other streams in this area are between 100 and 300 mm deep with pools up to 700 mm deep. River substrates are mainly boulders and cobbles, with some gravel. Stream substrates are bedrock, boulders and cobbles, with some mud in the lower reaches.

Eleven sites were electro-fished in this area: four in deeply-incised gorgy streams, five in large rocky streams and two in braided rivers. Koaro were found at nine sites, alpine galaxias at four sites, brown trout at three sites and rainbow trout at three sites. No fish were recorded at two sites. Additional species recorded in the NZFFD from this area are Canterbury galaxias, upland longjaw galaxias and upland bully.

Macro-invertebrates recorded in this area were: *Deleatidium* spp., *Nesameletus* sp., *Zephlebia* sp., *Zelandobius* sp., *Aoteapsyche* sp., *Hydrobiosis* sp., *Hydropsychidae* sp., *Olinga feredayi*, *Pycnocentria* sp., *Pycnocentroides aeris*, *Neocurupira* sp., *Aphrophila* sp., *Elmidae* sp. and *Sphaeriid* sp.

Although there is no published information on the invertebrate fauna of Mt Gerald Pastoral Lease, the caddis fly *Paroxyethira hintoni* (threat status: data deficient) has been collected from the nearby Godley Peaks Pastoral Lease. The aquatic larvae of this caddis fly inhabit mountain streams above 600 m (Winterbourn *et al.*, 2000).

Species Recorded

Five fish species were recorded during this survey of Mt Gerald Pastoral Lease.

Table Four Fish species recorded from Mt Gerald Pastoral Lease, February-March 2006.

Fish Species	Threat Status	Known Distribution on Property
alpine galaxias	Not threatened	River channels and larger tributaries.
brown trout	Introduced	Most permanent waterways.
koaro	Not threatened	Most permanent waterways.
rainbow trout	Introduced	River channels and large streams.
upland bully	Not threatened	Waterways on The Island.

Significance of the Freshwater Fauna

Freshwater habitats on the property are in good condition and support species typical of such habitats; with the exception of upland longjaw galaxias which were expected to be present, given the appropriate habitat and their presence in the NZFFD both up and down stream of this pastoral lease. The main stream and a channel of the Macaulay River on The Island both support a diverse fish fauna comprising populations of three indigenous species. Freshwater habitats on the property are contiguous with extensive intact habitats elsewhere in the Godley and Macaulay river catchments. The northern part of the property (in the Macaulay valley and the northern edge of The Island) lies within a catchment listed as a "Type I" Waters of National Importance. Type I implies whole river systems contain special features of national significance. This significance is because it is in the top ten sites by Natural Heritage Value score in its biogeographical unit; the catchment cover is largely natural; and it contains populations of threatened birds. The southern part of the property lies within a catchment listed as a "Type II" Waters of National Importance (Chadderton *et al.*, 2004). Type II implies that the waterway contains special features of national significance. Only sections of Type II catchments are of national importance. This significance is because it contains populations of threatened bird and fish communities.

Insert Aquatic values map

2.6.5 Terrestrial Invertebrates

Invertebrate sampling during this survey was concentrated mainly on beetles (Coleoptera). This order comprises the largest and most diverse group of insects in New Zealand. Beetles occur in all terrestrial and freshwater habitats and have the widest range of feeding habits of any group of terrestrial invertebrates. They are relatively well known in New Zealand compared with some other groups, and have been used extensively in ecological surveys (e.g. Harris and Burns, 2000).

The St John's wort beetles, *Chrysolina hyperici* and *C. quadrigemina* have been released on Mt Gerald Pastoral Lease (and other areas) for control of the toxic pasture weed St John's wort (Hancox *et al.*, 1986). Although large numbers of the greater St John's wort beetle (*C. quadrigemina*) were released on the property, the species survives patchily through the South Island (Fraser and Emberson, 1987). Only the lesser St John's wort beetle (*C. hyperici*) has been recovered in the area. Between 1983 and 1985 a study at Mt Gerald at 880 m showed that relatively low populations of lesser St John's wort beetles reduced the amount of weed present in spring (Syrett and Hancox, 1985).

Invertebrates of Mt Gerald Pastoral Lease are described below for the main parts of the property surveyed.

The Island

This area includes all of the area divided from the rest of the property by a braid of the Macaulay River, a finger of Unallocated Crown Land (UCL) and the wetland areas between The Island and Lilybank Road. Entomologically, the most interesting parts of this area are the sparsely vegetated stony ridges centred on the UCL but extending onto the property to the west and south. This area supports the northernmost reproducing population of the small grasshopper, *Sigaus* c.f. *minutus* 'blue', which is also the northernmost known population of any of the species of the *Sigaus minutus* complex. Suitable habitat for *S. minutus* occurs both on the UCL and on adjacent areas of the property.

Macaulay Valley

This area includes the valley of First Waterfall Stream and parts of the property further north. The main invertebrate values are associated with shrublands in the three waterfall gullies and beside North East Gorge Stream. In Third Waterfall Stream two species of host-specific flower weevils were collected from native broom (*Carmichaelia australis*), one species from *Olearia odorata*, a further species from flowering *O. avicenniaefolia* and two species from species of small-leaved *Coprosma*. The beetle fauna collected from shrubs in Second Waterfall Stream was less diverse, although an additional host-specific flower weevil species was collected from *O. odorata*. The shrubland beetle fauna of First Waterfall Stream is expected to be similar to that of Third Waterfall Stream.

A diverse streamside fauna, including three species of ground beetles not collected elsewhere on the property was found at the junction of Second Waterfall Stream and the Macaulay River. Tiger beetle holes, indicating the presence of these characteristic ground beetles, were found on a bank in tussockland between the streams. Aestivating St John's wort beetles were collected under rocks near St John's wort plants at about 1100 m. They are likely to be widespread over the property, but hard to collect at this time of year. The tussockland above 1200 m is likely to support a diverse and characteristic subalpine invertebrate fauna.

Godley Valley

This area includes the bulk of the property, south of First Waterfall Stream and excluding The Island. The invertebrate values identified were mainly along the upper boundary of the property above 1200 m and in stream gullies. The darkling beetle, *Artystona* n. sp., which feeds at night on lichens, was found in a rock pile to the south of Mt Gerald Creek. This is the first record of this species from a well known genus. The diving beetle, *Antiporus femoralis*, was found aestivating in very large numbers under rocks in a dry tarn just north of Ribbonwood Stream.

Higher altitude tall tussockland at the southeast corner of the property is likely to yield a diverse and representative fauna under better collecting conditions. Stone Hut Stream supports remnant woody vegetation that provides habitat for several species of host-specific flower weevils found here belonging to the genera *Peristoreus* and *Praolepra*. At lower altitudes the introduced Argentine stem weevil and strawberry root weevil, typical of developed pasture, were collected.

Species Recorded

During this invertebrate assessment of Mt Gerald Pastoral Lease, 71 species of insects were collected or observed from 23 sites. All were identified at least to tribe and most to genus or species. There were 44 beetle species (Coleoptera) from 10 families. Five of the beetle species are naturalised. There were two notable species, one a grasshopper in gradual decline, the other a new species of darkling beetle from a well-known genus.

Table Five Notable invertebrate species recorded from Mt Gerald Pastoral Lease, 2006.

Species	Threat Status	Distribution on Property
<i>Artystona</i> n. sp.	First record of a species from a well-known genus.	At 1270 m altitude in the southeast corner of the property.
<i>Sigauss</i> c.f. <i>minutus</i> 'blue'	Reproducing populations of a species in gradual decline.	Stony ridges on the eastern side of The Island.

Significance of the Invertebrate Fauna

Two notable species were collected from the property: a grasshopper (*Sigauss* c.f. *minutus* 'blue') and a new species of darkling beetle (*Artystona* n. sp.) from a well-known genus. The significant invertebrate values and habitats are concentrated in three main areas of the property: the higher altitude tussocklands, the waterfall gullies and the northern part of The Island.

Insert invertebrate values map

2.6.6 Problem Animals

Introduced animal species 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) are not discussed here.

Red deer, chamois and thar

These large wild animals were not observed on the property but are likely to be present on the Two Thumb Range adjacent to the property.

Brushtail possum

Possum sign was observed on the property. Possums are browsers of palatable indigenous plants and predators of birds, lizards and invertebrates.

Rabbits, hares, cats and hedgehogs

These species are present on the property.

2.7 HISTORIC

2.7.1 European Heritage Values

Mt Gerald Pastoral Lease was divided from Richmond Pastoral Lease in 1911. Richmond was first taken up for grazing in 1858 and at one point covered more than 14000 ha (35000 acres). Mt Gerald and Richmond were run together until Mt Gerald was sold to Donald Burnett in 1916. It was sold in 1918 and again run together with Richmond (for the last time) till it was sold in 1920 (Pinney, 1971).

Significance of Historic Resources

No significant historic resources are known from the property.

2.8 PUBLIC RECREATION

2.8.1 Physical Characteristics

The property can be divided into two main recreation units.

The Island

This recreation unit covers the alluvial outwash flats on the floor of the Godley River valley below the confluence of the Macaulay River. The predominance of mostly indigenous vegetation and unmodified landforms provide a natural setting for recreation. A feature of The Island is the flat relief and low ground cover which provides a sense of spaciousness with unimpeded views of the surrounding landscape. The Island is visible from the Lilybank Road and surrounding mountains.

The Western Faces

This recreation unit covers the rest of the pastoral lease which is primarily the western faces of the Two Thumb Range up the Macaulay River to the pastoral lease northern boundary. Notable landscape features include glacial terraces, hummocky moraine and the deeply incised gullies on the northern part of the property. The vegetation is variable with aspect and altitude; upper and some mid slopes are dominated by tall tussock grasslands and fescue tussock while pasture grasses dominate the lower altitude slopes. Some deer fencing exists on sections of the unit. Parts of this unit, especially the northern area provide a natural setting for recreation. The mid and southern areas at lower altitudes provide less of a natural setting. The unit is visible from the Lilybank Road, the Macaulay River and the surrounding mountains.

From an aesthetic and scenic perspective the pastoral lease contributes to the high country landscape which forms the setting for varied passive and active recreation activities.

2.8.2 Legal Access

Roads

Lilybank Road traverses the lower western part of the property, between The Island and the lower slopes of the Two Thumb Range, providing access through the property from Lake Tekapo to Lilybank Station and the Godley and Macaulay valleys. An unformed legal road traverses the western edge of The Island, on the floor of the Godley River valley.

Marginal Strips

No marginal strips appear to be present along streams on or within the property boundaries. The wide beds of the Godley and Macaulay rivers are Unallocated Crown land (UCL).

Adjoining Public Conservation Land

The property adjoins Mt Gerald/Two Thumb Conservation Area (Conservation Land Unit I36007) along the entire length of its eastern boundary on the upper slopes of the Two Thumb Range.

2.8.3 Activities

Higher-altitude parts of the property on the Two Thumb Range provide good opportunities for tramping, hunting, ski-touring and scenery appreciation. Vehicle tracks provide access to the upper slopes at three locations on the property. These tracks are suitable for horse-riding, mountain-biking and walking. The southernmost track also provides access to a privately-owned ski-touring hut just across the property boundary in the Mt Gerald/Two Thumb Conservation Area. Ridges and slopes on other parts of the property also provide opportunities for foot access to the Two Thumb Range. The deeply-incised gullies on the northern part of the property are spectacular and scenic. Higher altitude parts of the property provide spectacular views of the Godley and Macaulay valleys and the surrounding mountain ranges.

Lower-altitude parts of the property on the floor of the Godley and Macaulay valleys provide opportunities for walking, mountain-biking, horse-riding, fishing, bird-watching and four-wheel drive vehicle use. Vehicle access routes to the Godley and Macaulay valleys, including the route to the popular new hut in the upper Macaulay valley, pass through or alongside the lower-altitude part of the property.

Significance of Recreation

Significant features of the property for recreation are the opportunities it provides for access to the Macaulay and Godley rivers which lead to other destinations, The Island for bird watching and other low impact recreational activities and access onto the Two Thumb Range, a popular destination for ski-touring, tramping and hunting.

PART 3 OTHER RELEVANT MATTERS AND PLANS

3.1 CONSULTATION

Information-gathering meetings were held with representatives of non-governmental organisations (NGOs) at Christchurch on the 5th September 2005 and at Geraldine on the 6th September 2005. Comments made at those meetings are summarised below.

- Parts of the property in the Macaulay valley have high ecological and landscape values.
- The part of the property north of Stone Hut Stream is relatively steep; this area should be protected as public conservation land.
- It is important to protect sequences of vegetation between the riverbed and the mountain tops.
- The existing boundary with conservation land on the Two Thumb Range is impractical for fencing. The boundary fence should be at the base of the slope, at approximately the 900 m contour; tussockland above 900 m is in good condition.
- Areas retired from grazing should be fenced.
- Lower-altitude areas should be protected to provide a natural setting for recreation.
- Areas of value on the property should be protected as public conservation land, rather than by covenant.
- The Island (the area west of Lilybank Road) has important wetlands listed as Significant Natural Areas in the District Plan. The area provides important habitat for black stilts; it should be protected as conservation land.
- The property makes a significant contribution to the high natural landscape values of the area; much of the property is visible from Lake Tekapo.
- There is a registered Land Improvement Agreement over the property.
- Protection of water quality is important; the Macaulay River is an important fishing river.
- The property covers important access points to large areas of conservation land on the Two Thumb Range, an area that provides good opportunities for ski-touring and other recreation.
- Various access routes through the property should be provided to permit safe access in a range of weather conditions and to enable effective recreational use of the Two Thumb Range.
- Practical foot, mountain-bike and horse access should be provided along the formed track east of the homestead.
- Practical foot access should be provided up the east bank of the Macaulay River, up the Stone Hut Stream road and around the gorge in lower North East Gorge Stream.
- The area around Stone Hut should be protected as conservation land; the hut is a very handy base for recreation and is only one hour's walk from the road.
- Stone Hut has historic value and should be protected and maintained as a public hut for recreational use.
- Access routes must provide clear, indisputable year-round access for recreation.
- The property is close to Tekapo; a fast-growing town for which good recreational opportunities will be increasingly important.
- The proposed access route up the property boundary is impractical as it is overgrown; clearing of straight-line access routes can have a significant effect on landscape values.

3.2 DISTRICT PLANS

Mt Gerald Pastoral Lease lies within the Rural Zone of the Mackenzie District.

Sites of Natural Significance listed in the Mackenzie District Plan that lie on the property are:

- 67 Godley River: the floor of the Godley River valley, including part of The Island.
- 8 Stone Hut Moraine: Two Thumb RAP 1, covering the catchment of Third Waterfall Stream.

3.3 CONSERVATION MANAGEMENT STRATEGIES

Mt Gerald Pastoral Lease lies within the Waitaki Place Unit of the Canterbury Conservancy. Relevant priority objectives for this unit listed in the CMS (Department of Conservation, 2000) are:

- To identify, maintain and seek to enhance the natural landscapes and natural landscape values of the Waitaki Unit.
- To identify the significant indigenous vegetation and threatened species of the Waitaki Unit.
- To use a range of effective methods to protect the indigenous biodiversity of the Waitaki Unit.
- To protect and enhance the viability of priority threatened species populations and their habitat(s) in the Waitaki Unit.
- To improve the range of viable riparian habitats for indigenous species in the Mackenzie Basin.
- To encourage landholders to cooperate in protecting braided river systems.
- To investigate conservation park status for the areas of land managed by the Department in the Ohau-Ahuriri area, Two Thumb Range and Hawkdun-Oteake area and, if agreed to by the Minister, gazette relevant conservation parks.
- To prevent the loss of natural and landscape values from wilding trees on land managed by the Department.
- To liaise with land managers and regulatory agencies to contain and control wilding trees.
- To reduce and maintain rabbit and thar densities to levels that ensure their adverse effects on natural values are minimised.
- To provide new recreational facilities and opportunities by the Department and other organisations and concessionaires where natural and historic resources and cultural values are not compromised.

3.4 NEW ZEALAND BIODIVERSITY STRATEGY

The New Zealand Government is a signatory to the Convention on Biological Diversity. In February 2000, Government released the New Zealand Biodiversity Strategy. This strategy is a blueprint for managing the country's diversity of species and habitats. It sets a number of goals to achieve this aim. Of particular relevance to tenure review is Goal 3, which states:

- Maintain and restore a full range of remaining natural habitats and ecosystems to a healthy functioning state, enhance critically scarce habitats, and sustain the more modified systems in production and urban environments, and do what is necessary to:
- Maintain and restore viable populations of all indigenous species across their natural range and maintain their genetic diversity.

PART 4 ATTACHMENTS

4.1 ADDITIONAL INFORMATION

4.1.1 Scientific Names of Species

Plant Species referred to in text

Species names follow those in the published volumes of New Zealand Flora and the name changes listed in A Checklist of Indigenous Vascular Plants of New Zealand, 10th Revision (*Unpublished Document*, S. Courtney, Department of Conservation, Nelson). Maori names are included for taonga species listed in Schedule 97 of the Ngai Tahu Claims Settlement Act 1998. Naturalised species are indicated by an asterisk (*).

<u>Common name</u>	<u>Scientific name</u>
blue tussock.....	<i>Poa colensoi</i>
bog rush.....	<i>Schoenus pauciflorus</i>
bracken.....	<i>Pteridium esculentum</i>
broadleaf/kapuka.....	<i>Griselinia littoralis</i>
broom*.....	<i>Cytisus scoparius</i>
browntop*.....	<i>Agrostis capillaris</i>
cocksfoot*.....	<i>Dactylis glomerata</i>
comb sedge.....	<i>Oreobolus pectinatus</i>
coral broom.....	<i>Carmichaelia crassicaule</i>
crack willow*.....	<i>Salix fragilis</i>
creeping pohuehue.....	<i>Muehlenbeckia axillaris</i>
cushion broom.....	<i>Carmichaelia nana</i>
dwarf inaka.....	<i>Dracophyllum pronum</i>
false speargrass/taramea.....	<i>Celmisia lyallii</i>
feathery tutu.....	<i>Coriaria plumosa</i>
fescue tussock.....	<i>Festuca novae-zelandiae</i>
giant speargrass/taramea.....	<i>Aciphylla scott-thomsonii</i>
golden speargrass/taramea.....	<i>Aciphylla aurea</i>
gorse*.....	<i>Ulex europaeus</i>
grassland buttercup.....	<i>Ranunculus multiscapus</i>
harebell.....	<i>Wahlenbergia albomarginata</i>
lancewood.....	<i>Pseudopanax crassifolius</i>
larch*.....	<i>Larix decidua</i>
Lombardy poplar*.....	<i>Populus nigra</i>
male fern*.....	<i>Dryopteris filix-mas</i>
manuka.....	<i>Leptospermum scoparium</i>
matagouri.....	<i>Discaria toumatou</i>
mountain akeake.....	<i>Olearia avicenniifolia</i>
mountain beech.....	<i>Nothofagus solandri</i> var. <i>cliffortioides</i>
mountain heath.....	<i>Leucopogon suaveolens</i>
mountain ribbonwood/houhi.....	<i>Hoheria lyallii</i>
mountain toatoa.....	<i>Phyllocladus alpinus</i>
mountain totara.....	<i>Podocarpus hallii</i>
mountain wineberry.....	<i>Aristotelia fruticosa</i>

mouse-ear hawkweed*	<i>Hieracium pilosella</i>
narrow-leaved snow-tussock	<i>Chionochloa rigida</i>
patotara	<i>Leucopogon fraseri</i>
porcupine shrub	<i>Melicytus alpinus</i>
purging flax*	<i>Linum catharticum</i>
rautahi	<i>Carex coriacea</i>
red pondweed	<i>Potamogeton cheesemanii</i>
red tussock	<i>Chionochloa rubra</i>
red woodrush	<i>Luzula rufa</i>
sheep's sorrel*	<i>Rumex acetosella</i>
short tussock	<i>Festuca</i> sp.
silver tussock/wi	<i>Poa cita</i>
slim snow-tussock	<i>Chionochloa macra</i>
snowberry	<i>Gaultheria depressa</i>
snow totara	<i>Podocarpus nivalis</i>
speargrass/taramea	<i>Aciphylla</i> sp.
sphagnum moss	<i>Sphagnum</i> sp.
St John's wort*	<i>Hypericum perforatum</i>
sundew	<i>Drosera arcturi</i>
sweet brier*	<i>Rosa rubiginosa</i>
sweet vernal*	<i>Anthoxanthum odoratum</i>
tall tussock	<i>Chionochloa</i> sp.
tauhinu	<i>Ozothamnus leptophyllus</i>
turpentine shrub	<i>Dracophyllum uniflorum</i>
water buttercup*	<i>Ranunculus trichophyllus</i>
water forget-me-not*	<i>Myosotis laxa</i> ssp. <i>caespitosa</i>
woolly head	<i>Craspedia</i> sp.

Animal Species referred to in text

Species names follow King (1990) for mammals, the June 2003 version of the New Zealand Recognized Bird Names list (compiled by C.J.R. Robertson and D.G. Medway for the Ornithological Society of New Zealand Inc.) for birds, Whitaker (1998) for lizards and McDowall (2000) for fish. Common names for invertebrates are those listed in the Entomological Society of New Zealand's Handbook of New Zealand Insect Names (Scott and Emberson, 1999). Maori names are included for taonga species listed in Schedule 97 of the Ngai Tahu Claims Settlement Act 1998. Naturalised species are indicated by an asterisk (*).

<u>Common name</u>	<u>Scientific name</u>
alpine galaxias	<i>Galaxias paucispondylus</i>
Argentine stem weevil*	<i>Listronotus bonariensis</i>
Australasian bittern	<i>Botaurus poiciloptilis</i>
Australasian crested grebe/kamana	<i>Podiceps cristatus australis</i>
Australasian harrier/kahu	<i>Circus approximans</i>
Australasian pied stilt/poaka	<i>Himantopus himantopus leucocephalus</i>
Australian magpie*	<i>Gymnorhina tibicen</i>
banded dotterel	<i>Charadrius bicinctus bicinctus</i>
bar-tailed godwit	<i>Limosa lapponica</i>
bat	see South Island long-tailed bat
black-billed gull	<i>Larus bulleri</i>
blackbird*	<i>Turdus merula</i>
black-fronted tern	<i>Sterna albostrata</i>
black shag/koau	<i>Phalacrocorax carbo novaehollandiae</i>
black stilt/kaki	<i>Himantopus novaeseelandiae</i>
black swan	<i>Cygnus atratus</i>

brown hare*	<i>Lepus europaeus occidentalis</i>
brown trout*	<i>Salmo trutta</i>
brush-tail possum*	<i>Trichosurus vulpecula</i>
Butler's mountain ringlet	<i>Erebiola butleri</i>
Canada goose*	<i>Branta Canadensis maxima</i>
Canterbury galaxias	<i>Galaxias vulgaris</i>
Caspian tern	<i>Sterna caspia</i>
cat*	see house cat
chaffinch*	<i>Fringilla coelebs</i>
chamois*	<i>Rupicapra rupicapra rupicapra</i>
chestnut-breasted shelduck	<i>Tadorna tadornoides</i>
chukor*	<i>Alectoris chukar</i>
common bully	<i>Gobiomorphus cotidianus</i>
common skink	<i>Oligosoma nigriplantare polychroma</i>
dunnock*	<i>Prunella modularis</i>
European hedgehog*	<i>Erinaceus europaeus occidentalis</i>
European rabbit*	<i>Oryctolagus cuniculus cuniculus</i>
goldfinch*	<i>Carduelis carduelis</i>
greenfinch*	<i>Carduelis chloris</i>
green blowfly	<i>Lucilia sericata</i>
green skink	<i>Oligosoma chloronoton</i>
grey duck/parera	<i>Anas superciliosa superciliosa</i>
grey teal/tete	<i>Anas gracilis</i>
grey warbler/riroriro	<i>Gerygone igata</i>
hare*	see brown hare
hedgehog*	see European hedgehog
Himalayan tahr*	<i>Hemitragus jemlahicus</i>
house cat*	<i>Felis catus</i>
house sparrow*	<i>Passer domesticus</i>
jewelled gecko	<i>Naultinus gemmeus</i>
kea	<i>Nestor notabilis</i>
koaro	<i>Galaxias brevipinnis</i>
little shag	<i>Phalacrocorax melanoleucos brevirostris</i>
longfin eel/tuna	<i>Anguilla dieffenbachii</i>
long-toed skink	<i>Oligosoma longipes</i>
McCann's skink	<i>Oligosoma maccanni</i>
mallard*	<i>Anas platyrhynchos platyrhynchos</i>
marsh crake	<i>Porzana pusilla affinis</i>
New Zealand falcon/karearea	<i>Falco novaeseelandiae</i>
New Zealand pipit/pihoihoi	<i>Anthus novaeseelandiae novaeseelandiae</i>
New Zealand scaup	<i>Aythya novaeseelandiae</i>
New Zealand shoveler/kuruwhengu	<i>Anas rhynchotis variegata</i>
paradise shelduck/putakitaki	<i>Tadorna variegata</i>
possum*	see brush-tail possum
pukeko/pakura	<i>Porphyrio porphyrio melanotus</i>
rabbit*	see European rabbit
rainbow trout*	<i>Oncorhynchus mykiss</i>
Rangitata skink	<i>Oligosoma sp.</i>
red deer*	<i>Cervus elaphus scoticus</i>
redpoll*	<i>Carduelis flammea</i>
rock pigeon*	<i>Columba livia</i>
rock wren	<i>Xenicus gilviventris</i>
scree skink	<i>Oligosoma waimatense</i>
short-tailed bat	<i>Mystacina tuberculata</i>
silveryeye	<i>Zosterops lateralis lateralis</i>

skylark*	<i>Alauda arvensis</i>
song thrush*	<i>Turdus philomelos</i>
Southern Alps gecko	<i>Hoplodactylus</i> aff. <i>maculatus</i> “Southern Alps”
southern black-backed gull/karoro	<i>Larus dominicanus dominicanus</i>
South Island fantail/piwakawaka	<i>Rhipidura fuliginosa fuliginosa</i>
South Island long-tailed bat	<i>Chalinolobus tuberculatus</i>
South Island pied oystercatcher	<i>Haematopus ostralegus finschi</i>
South Island rifleman/titipounamu	<i>Acanthisitta chloris chloris</i>
South Island tomtit/miromiro	<i>Petroica macrocephala macrocephala</i>
spotted skink	<i>Oligosoma lineocellatum</i>
spur-winged plover	<i>Vanellus miles novaehollandiae</i>
starling*	<i>Sturnus vulgaris</i>
St John’s wort beetles*	<i>Chrysolina</i> spp.
strawberry root weevil*	<i>Otiorhynchus ovatus</i>
tahr*	see Himalayan tahr
upland bully	<i>Gobiomorphus breviceps</i>
upland longjaw galaxias	<i>Galaxias prognathus</i>
welcome swallow	<i>Hirundo tahitica neoxena</i>
white-faced heron	<i>Ardea novaehollandiae novaehollandiae</i>
wrybill	<i>Anarhynchus frontalis</i>
yellowhammer*	<i>Emberiza cintrenella</i>

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