

Crown Pastoral Land Tenure Review

Lease name : Godley Peaks

Lease number : Pt 017

Conservation resources report

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

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

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GODLEY PEAKS PASTORAL LEASE



CONSERVATION RESOURCES REPORT

April 2003

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PART 1 INTRODUCTION

This report describes the significant inherent values present on Godley Peaks Pastoral Lease. The information presented in this report is derived from field surveys undertaken during November 2002 and data collated between November 2002 and January 2003. Field survey reports upon which this report is based are listed below. The methodologies used for the field surveys are described in those reports, and are not outlined again in this report. This report forms part of the Godley Peaks Pastoral Lease tenure review process.

Godley Peaks Pastoral Lease covers an area of approximately 14493 hectares at the northern end of the Mackenzie Basin in Canterbury. The property lies west of Lake Tekapo and its major tributary, the Godley River. It covers the eastern flank of the Hall Range between the Cass River in the south and Rutherford Stream in the north. Godley Peaks Pastoral Lease adjoins a large area of Crown land Area to the west; Glenmore Pastoral Lease across the Cass River to the south; Crown land (UCL) in the Godley Valley to the northeast; and, Lake Tekapo to the southeast. Micks Lagoon Wildlife Reserve and Cass River Delta Conservation Area adjoin the property in the southeast.

Godley Peaks Pastoral Lease covers the steep broken slopes of the Hall Range, and a smaller area of gentler moraine country at the south end of the property between the lower Cass River and Lake Tekapo. It lies between approximately 700 metres altitude at Lake Tekapo and 2430 metres altitude at Mt Radove, with the majority of the property above 900 metres. The property is drained by Mistake Creek in the south, and elsewhere by tributaries of the Godley River including Rankin, Manning, Pollock and Little Hogget streams, and Ribbonwood and Sutherland creeks.

The property lies almost entirely within the Godley Ecological District (Tasman Ecological Region); only a relatively small area of lower-altitude moraine-covered country in the south of the property lies within the Tekapo Ecological District (Mackenzie Ecological Region). Mackenzie Ecological Region was surveyed as part of the Protected Natural Areas Programme in the early 1980s. Two areas identified as priority natural areas (PNA) for protection during that survey (Espie *et al*, 1984) lie wholly on Godley Peaks Pastoral Lease (Tekapo PNA 24 Micks Lagoon and Tekapo PNA 25 Raupo Lagoon) and the property adjoins two other priority natural areas (Tekapo PNA 23 Lower Cass River and Tekapo PNA 26 Lake Tekapo). The first two areas are also listed as Sites of Special Wildlife Interest of “outstanding” value.

Field survey reports upon which this report is based:

- Godley Peaks Pastoral Lease, Assessment of Natural Landscape Values, Anne Steven, December 2002. 27p+maps+photographs.
- Godley Peaks Pastoral Lease Botanical Assessment, Carol Jensen, January 2003, 11p+photographs+map.
- Assessment of the Fauna Values of Godley Peaks Pastoral Lease, Jane Sedgely, DOC, December 2002, 12p+map+photographs.
- Godley Peaks Pastoral Lease Invertebrate Assessment, Simon Morris, February 2003, 11p+maps+photographs.
- Godley Peaks Pastoral Lease, Report on Aquatic Fauna Surveys, Scott Bowie, January 2003, 13p+map+photographs.

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

2.1 LANDSCAPE

2.1.1 Landscape Context

Godley Peaks Pastoral Lease is situated in the Mackenzie Basin, a large part of which has been identified as one of the most extensive outstanding natural landscapes in the Canterbury Region. The sheer scale and openness of the landscape and its natural character are unsurpassed in New Zealand (Boffa Miskell and Lucas Associates, 1993). The Hall Range is identified as regionally significant by that study, as the major peaks of the range are a visually integral part of the Mackenzie Basin landscape.

Physically, Godley Peaks Pastoral Lease ranges from basin-floor topography (moraine downlands and alluvial surfaces) to steep rectilinear mountains. In the north of the property, closer to the main divide of the Southern Alps, the topography becomes increasingly steep and rugged with much exposed rock. The landforms of the Hall Range and the lower Cass and Mistake valleys, left by the Godley Glacier as it pushed south and west to merge with the Tasman Glacier, are an integral part of the glacial morphology of the area.

The southern part of Godley Peaks Pastoral Lease forms a significant part of the northern Mackenzie Basin landscape. Mistake Peak ridge on the south end of the Hall Range is a prominent part of the mountain backdrop enclosing the Mackenzie Basin between the Tekapo and Pukaki valleys. Its rounded form with the rocky knob of Mistake Peak perched on top are easily recognisable from great distances and from different perspectives. Collectively, the distinctive landforms of Mistake Peak, Mt Joseph and Braemar Dome form an impressive and memorable backdrop to the Mackenzie Basin and imbue the area with special character.

The mountains at the south end of the property are highly visible from parts of State Highway 8 and Lake Tekapo village. The Hall Range is also prominent in views across Lake Tekapo and the Godley Valley from Lilybank Road. The property contains several visually-striking features and areas of high aesthetic value.

Obvious cultural modification is limited to a few inconspicuous fences and four-wheel-drive tracks; a few small scattered buildings; occasional exotic woodlots and shelterbelts; and, areas of developed pasture at lower altitudes.

2.1.2 Landscape Description

At the broadest level, Godley Peaks Pastoral Lease is within the “Intermontane Ranges and Basins Landscape Type”, a band of mountain ranges, valleys and basins running the length of and parallel to the main divide of the Southern Alps (Boffa Miskell and Lucas Associates, 1993). At a district level the property lies within the “Mackenzie Basin”, the largest intermontane basin.

At a sub-basin level, the Mackenzie Basin landscape can be divided into three different landscape compartments. Godley Peaks Pastoral Lease falls into three of these landscape compartments: the “Lake Tekapo Landscape Compartment” comprising the lower altitude country along the Cass River and the east side of the Hall Range as far north as Little Rough spur; the “Jollie-Fork-Cass Landscape Compartment” comprising Mistake Valley; and, the “Godley Landscape Compartment” comprising the northern end of the property.

For the purposes of this landscape assessment (pastoral lease tenure review) Godley Peaks Pastoral Lease is further divided into eight landscape units. These units are illustrated on the Landscape Unit Map appended to this report, and are described below.

Landscape Unit 1, Homestead

The Homestead Unit lies between Lake Tekapo, Godley Peaks Road, and the Cass and Mistake rivers. It comprises flat to undulating subdued glacial moraine and low-angle alluvial fan topography between 700 and 800m altitude, and extending right to the lakeshore. The area has been extensively modified through subdivision into geometric paddocks which contain cultivated pasture, fodder crops or degraded short tussockland. Coniferous shelterbelts line paddock boundaries. Swamps and small tarns occur within the area, including Micks Lagoon and Rapuwai Lagoon. This area also contains the Godley Peaks homestead.

Landscape Unit 2, Cass River

The Cass River Unit includes the broad gravel floodplain and braided channels of the river’s lower reaches where it forms the boundary of the property. A period of rapid post-glacial down-cutting has produced a deep, steep-sided meandering valley through the moraine near the homestead. Small, low, discontinuous terraces occur within this valley. These support grassland of variable condition and wetlands in moist depressions. Willow trees are dotted down the river course. The steep planar side-slopes have a sparse short tussockland/matagouri¹ scrub cover.

Upstream, where the Cass River passes Joseph Valley Wetland on the Glenmore side, the riverbed is more open and not entrenched. The only obvious cultural elements are a small evergreen woodlot on the crest of the terrace just downstream from the open section of river, and trees planted downstream beside the road.

Landscape Unit 3, Godley Peaks Moraine

The Godley Peaks Moraine Unit is a large area of moraine hill and down-land above (west of) Godley Peaks Road and bisected by the Mistake River. It has steep to gentle rolling to hummocky topography comprising moraine ridges, melt-water channels and recent alluvial gullies. It rises from approximately 780m to over 1100m altitude. The unit slopes southwest and southeast, draining into the Cass and Mistake rivers. It is generally well vegetated with little visible rock, scree or bare ground. Vegetation is predominantly tussockland and matagouri scrub, with areas of depleted grassland in places and areas of snow tussockland at higher altitudes particularly east of Mistake River.

The area is extensively grazed in small- to medium-sized blocks. A four-wheel-drive track winds up the face on the east side of Mistake River, and also up the true right of the Mistake Valley. This unit can be subdivided into three landscape sub-units:

Bottom Moraine (North and South shearing paddocks): This area has flatter and finer textured topography with a distinct southeast-northwest grain, and comprising a series of small ridges

¹ Scientific names of species are listed in Section 4.1.1

and hillocks. This appears to be an old fluvio-glacial surface related to the Mistake River, as this kind of topography is confined to the area between the Mistake and Cass rivers. Small tarns lie in depressions at the southern end. The area is fenced into two large paddocks, with a conifer shelter-belt at the upper boundary along the rim of Mistake Valley.

Middle Moraine (Skinnys and Berties blocks): This is an area of higher, steeper and more variable terrain draining southwest into the Cass River. A melt-water channel separates it from the Bottom Moraine Sub-unit, and the short tussockland cover is slightly healthier.

Upper Moraine (Bridge Block): This sub-unit covers the highest part of the moraine, rising to around 1100m altitude. A small discrete lateral moraine hill (1178m) sits on the upper edge. This lateral moraine is veneered across the lower south end of the Mistake Peak ridge, with a small section in Mistake Valley. It has moderately-steep to steep terrain of a rolling hummocky nature, although lower slopes tend to be more planar. Numerous small and often discontinuous gullies dissect the slopes. Vegetation is more variable and includes short and tall tussockland and matagouri scrub.

Landscape Unit 4, Lower Mistake Valley

In the Lower Mistake Valley Unit the Mistake River has cut a large angular valley into the moraine, with the sharp crest of the valley slopes and angular forms suggesting a period of rapid post-glacial down-cutting. The valley floor is narrow and bouldery. The planar side-slopes are sculpted by numerous small gullies giving a ribbed appearance, and there are large patches of active scree. Depleted tall and short tussockland and matagouri scrub form the predominant plant cover.

Landscape Unit 5, Mistake Hill

This unit covers the lower southeast end of the Mistake Peak ridge, facing Lake Tekapo. It has a broad rolling crest some 1500 to 1580m in altitude that falls away steeply to the east. The upper slopes are dissected by evenly-spaced and evenly-sized gullies giving a distinctive coarsely-ribbed appearance. These gullies are interrupted by moraine benches. The lower slopes are broadly concave. Exposed rock is absent except for a few patches of talus.

Vegetation cover is similar to that in Landscape Unit 4 although the lower slopes have been fenced into rectangular paddocks. Inaka scrub and snow tussockland are predominant above about 1200m altitude, and stonefield is present on the broad summit of the ridge.

Landscape Unit 6, Upper Mistake Valley

This is a large elevated and relatively remote sub-alpine valley at 1120-1200m altitude, and perched some 500 to 600m above the Mackenzie Basin. The wide valley floor comprises a mix of meandering floodplain, piedmont fan and hummocky moraine. The fans tend to be rather wrinkled in appearance, probably due to their composition of large angular boulders deposited in single events rather than gradually by streams. The enclosing mountain slopes of the Haszard and Mistake Peak ridges rise to over 2000m altitude.

Vegetation cover is predominantly tall tussockland with small patches of scrub. Short tussockland is present on the lower slopes and valley floor. The tussockland varies from being extremely depleted on some faces and on parts of the valley floor to being relatively dense, especially on cooler aspects. The consistent cover of tussockland renders the topography highly legible and the whole valley has a beautiful sculptural quality. Apart from a four-wheel-drive track there are no other obvious cultural elements.

This unit also includes a small part of the Cass Valley in which the valley sides are characteristically long and steep with an even gradient all the way to the valley floor. The valley sides are dissected by long gullies and have long parallel ribbons of scree, often headed by rock bluffs. Steep alluvial cones line the base of the slope. The slope curves around to the northeast and drops in height to merge with the high moraine. The end of the range comprises an old funnel-shaped basin, the contents of which now form a spectacular large, steep and symmetrical alluvial fan with a stream at its centre. These slopes are relatively well vegetated; inaka scrub is common over mid to upper slope giving a rusty tinge to the surface.

Landscape Unit 7, Hall Range

The Hall Range is a high mountain range trending north for approximately 25km from Mistake Peak to the Liebig Range near the Main Divide. It rises from approximately 700m altitude at Lake Tekapo, and 900m on the valley floor in the north (at Rutherford Stream), to well over 2000m at the highest peaks. The range forms the true right of the Godley Valley, one of the larger braided river valleys of the Mackenzie Basin.

A number of large subsidiary ridges and spurs dissect the heavily-glaciated main range and form deep valleys. These spurs have been truncated by the Godley Glacier, creating the series of large steep triangular faces. Side-valleys are typically broadly-curving to straight with sheer ice-scoured sides, and dividing ridges tend to be steep-sided with numerous sharp peaks and knobs. Cirque basins lie at the head of the side valleys, typically on the north and west sides, facing south and east. The most recent advance of the Godley Glacier reached down-valley to near Kea Gully (Sibbalds Island terminal moraine was deposited during this advance). The terrain north (up-valley) from this point is more rugged and precipitous, with recent lateral moraine in the side valleys (e.g. Rankin and Rutherford valleys).

Post-glacial erosion has further modified the steep slopes. They are dissected by numerous gullies, and mantled with talus and scree. The surface of the range is a vertically-oriented mosaic of bedrock, talus and scree separated by steep well-vegetated slopes. Plant communities are a mix of tall and short tussockland, matagouri scrub, mixed sub-alpine shrubland, and herbfield. Pasture grasses and mouse-ear hawkweed are present on the lower slopes. Fences are a minor cultural element on the valley floor and lowest slopes. A few vehicle access tracks criss-cross the lower range slopes in places.

Landscape Unit 8, Godley River Flats

This unit covers the relatively small areas of older vegetated river flat and low-angle alluvial fans along the western edge of the Godley riverbed, most of which is a braided gravel floodplain. At the head of Lake Tekapo there are larger areas of wetland (dominated by sedges and red tussock), which are presently grazed by cattle. Short tussockland (with exotic grasses and herbs) is the main cover on these relatively recent surfaces, with extensive patches of matagouri scrub on the alluvial fans.

A well-formed four-wheel-drive vehicle track runs up the valley to Rankin Hut, providing access to a lodge (John Scott Lodge) and three small station huts. Small plantations of conifers and willows are present near these buildings. Areas of developed pasture in the lower valley are fenced into several large paddocks.

2.1.3 Visual Values

The southern part of Godley Peaks Pastoral Lease is visible from a number of places within the Mackenzie Basin. Most views of the property are distant and panoramic. Mistake Peak ridge is most prominent in these views and is an important visual element of the Basin landscape. The main public views are from Lake Tekapo village and State Highway 8. Other important views are from Godley Peaks, Lilybank, and Braemar roads, and from Round Hill Ski Area and Lake Alexandrina. Panoramic views of the property can be gained from Mt John. Northern parts of the property are only visible from Lilybank Road or the Godley riverbed.

Views from State Highway 8: The most important views are from the section of highway between Balmoral Military Camp and Mt John, and between Lake Tekapo village (on its east side) and a point about 4km east, just where the highway rises on to the high outwash terrace west of Edward Stream. The mountains between Tekapo and Pukaki form the visual backdrop to the Mackenzie Basin from more distant sections of State Highway 8, such as between Lake Ruataniwha and the Lake Ohau turnoff, but even in these distant views Mistake Peak is a recognisable feature.

Views from the Braemar Road: There are very impressive views of Mistake Peak ridge and other peaks west of the property from this road. The visual character of this landscape is memorable: it is almost exclusively composed of natural landforms of outwash plain, moraine and mountain peak with a cover of tussock, scree and rock, creating an image of striking simplicity, unity and cohesiveness.

View from Tekapo Village: The view up Lake Tekapo from the village is one of the iconic views of the Canterbury high country. It is a very popular tourist view, seen from the Church of the Good Shepherd (with the classic view through the altar window) and from the Mackenzie Memorial. The Mistake Peak ridge is a key element underlying the impact and quality of this view.

View from Lilybank Road and Round Hill Ski Field: Lilybank Road is a no-exit shingle road providing access to Round Hill Ski Field and to several pastoral runs on the east side of Lake Tekapo. Almost all the property is visible from this road: a great mountain-range panorama with a foreground of Lake Tekapo or the Godley riverbed. The physical structure of the range and its subsidiary ridges and spurs, the glacial shaping processes, and the patterns of vegetation can be obtained in these views.

Views from Mount Cook Road (State Highway 80) and the canal roads: The distinctive bulge of Mistake Peak is distantly visible from the canal roads and from State Highway 80 at least as far north as Peters Lookout. It is the eastern-most part of the impressive panorama of mountain ranges seen from across the Tasman Valley.

Views from Mt John and Godley Peaks Road: Views of similar aspect to those from State Highway 8 west of Tekapo are gained from the first few kilometres of the Godley Peaks Road. More detailed views of the Haszard Ridge, Cass Valley and Mistake Peak ridge are gained as the road approaches the property. These ridges also form a large part of an impressive panoramic view gained from the top of Mt John.

View from Lake Alexandrina: Mistake Valley is the focus of views from the south end of Lake Alexandrina.

Views from the Cass Riverbed: The immediate enclosing slopes of the Cass River are visible in detail from Crown land in the Cass riverbed.

2.2 LANDFORMS AND GEOLOGY

Three distinct and contrasting landforms dominate Godley Peaks Pastoral Lease: the mountainous glaciated country of the Hall Range, which makes up the bulk of the property; the broad outwash plain of the Godley River, of which only a small part is within the pastoral lease; and, the low-altitude moraines and river gravels in the south of the property between the Hall Range and the Cass River. The mountainous country comprises greywacke and argillite of the Torlesse Group with some recent alluvium in upper Mistake Creek; the river floodplain comprises recent outwash gravel; and, the moraine country comprises glacial till of the Tekapo and Mt John formations (Gair, 1967).

The effects of recent glaciation and subsequent fluvial erosion are clearly illustrated by landforms on the property. High summits and ridges of the Hall Range are ice-steepened arêtes, surrounded by frost-shattered rock buttresses and mantled with broken talus that forms extensive scree slopes. The valleys are U-shaped in their upper reaches, originating from small cirque basins, and frequently narrow and incised in their lower reaches. The eastern faces of the Hall Range are truncated and carved smooth by glaciers, and mantled with moraine where these glaciers carved south and west into the Mackenzie Basin.

Godley Peaks Pastoral Lease is mostly mountainous, rising to 2430m altitude at Mt Radove, with a large proportion of the property lying above 900m. Areas of gentle terrain are confined to a relatively small part of the property on the toe-slopes and flats of the Godley River and middle reaches of Mistake River, and the gently-sloping moraine-covered country around the lower reaches of the Cass and Mistake rivers at the southern end of the property.

The property is drained by tributaries of the Godley and Mistake rivers. All eastern and northern parts of the property are drained by the western tributaries of the Godley River, including Rankin, Manning, Pollock and Little Hogget streams, and Ribbonwood and Sutherland creeks. Western and southern parts of the property are drained by lower tributaries of the Mistake and Cass rivers. All eventually drain to the Waitaki River via Lake Tekapo.

Soils on the property are predominantly high country yellow-brown earths: Kaikoura soils dominate the steeplands; and, Tekapo, Cass and Puketeraki soils dominate the rolling lower-altitude country in the south. Recent Tasman soils and Dobson gley soils are present on alluvium. Weakly developed alpine soils are present on the crest of the Hall Range.

2.3 CLIMATE

Godley Peaks Pastoral Lease lies in the rain shadow of the main divide of the Southern Alps. Winds are predominantly from the northwest and are most frequent in spring and autumn. Summers are warm and dry; winters are cold with frequent snow and severe frosts. Snow can fall throughout the year and can lie for several months on higher-altitude parts of the property. Annual precipitation is 600mm at Lake Tekapo and probably over 5000mm in the north of the property near the main divide (McEwen, 1987).

2.4 VEGETATION

2.4.1 Original Vegetation

McEwen (1987) described the former (pre-European) vegetation of the Godley Ecological District as predominantly tall tussockland with short tussockland and matagouri on river flats, mountain toatoa scrub, mountain totara forest, and minor areas of silver beech forest in the southeast. Wilson (1978) concurs that montane parts of the district were probably dominated by low-stature mountain toatoa-mountain totara forest. However, McGlone (2001) suggests that tall tussock (*Chionochloa*) was likely to have been confined to alpine areas and that montane slopes supported low-stature forest and scrub.

An extensive part of Godley Peaks Pastoral Lease lies above the natural timberline, and is dominated by tussockland, exposed rock and scree. Present-day vegetation in the alpine zone is probably much as it was prior to the arrival of humans, except for some depletion and modification caused by introduced mammals. Vegetation in the montane zone has undoubtedly been modified and depleted by the increased frequency of fire associated with human settlement, and the effects of grazing animals. Plant communities at the wetter northern end of the property appear less affected by these influences and probably more-closely resemble the original vegetation in that area.

Lower-altitude parts of the property are likely to have supported red tussockland, short tussockland, wetland vegetation, or stonefield communities depending on substrate and drainage. Vegetation in these areas is much more substantially altered, with substantial areas now supporting developed pasture.

2.4.2 Indigenous Plant Communities

The present-day vegetation of Godley Peaks Pastoral Lease is mainly tall tussockland with short tussockland and matagouri shrubland on river flats. There are limited areas of scrub and forest (mainly mountain toatoa and mountain totara) on montane slopes, and extensive areas of tall tussockland, and bare rock and scree with scattered specialised plants at higher altitudes. The gently sloping southern end of the property between the Cass and Mistake rivers has some depleted short tussockland but most of this area has been extensively modified by over-sowing and top-dressing and, in some places, irrigation. The main plant communities on the property are described below.

Forest

Remnants of mountain totara forest survive on boulder-fields surrounded by mixed shrubland on the steep faces below Mistake Peak. A single mountain totara tree is also present just outside the property boundary on the north side of Rutherford Stream. These trees are representative of the more extensive mountain totara forest that would have originally been present along the range slopes.

Other small trees such as kowhai, mountain ribbonwood, broadleaf and manuka occur in small pockets amongst scrub along the base of the slopes in the Godley Valley.

Scrub and Shrubland

Scrub and shrubland occur over less than 10% of the property. These communities are present mainly on the lower slopes of the Hall Range, and the fans and gorges of the streams feeding into the Godley River and Lake Tekapo.

The steep faces above Lake Tekapo are well vegetated. Dominant species include mountain totara, matagouri, mingimingi and *Olearia bullata*. Also present are mountain ribbonwood, weeping matipo, korokio, porcupine shrub, *Hebe subalpina*, *Coprosma intertexta*, sweet brier and occasional wilding pines. Climbers, including bush lawyer, pohuehue, scrub pohuehue and native jasmine are common. A population of the threatened shrub, *Hebe cupressoides*, is present on the edge of a steep boulder-field on these slopes. Associated shrubs at this site are mingimingi, *Hebe subalpina*, korokio, *Olearia bullata*, porcupine shrub, mountain wineberry, mountain ribbonwood, pohuehue, native jasmine and bush lawyer.

Tall matagouri scrub grows on the wide fans built up by Sutherland and Ribbonwood creeks, and Little Hogget and Pollock streams. These wide fans support the tallest and oldest matagouri on the property, with individual plants up to 4m high. Beneath the matagouri is a short turf of sweet vernal and fescue tussock. The threatened shrubs *Coprosma intertexta* and *Olearia bullata* are present, and in places common, in these lower-altitude shrublands.

Near Ribbonwood Hut is a group of small kowhai trees: the only kowhai seen during survey. They gain some protection from steep rock outcrops and surrounding scrub. Species present nearby include matagouri, mingimingi, and *Olearia odorata*, with porcupine shrub and the leathery fern *Pyrrosia eleagnifolia* in rock clefts.

The range slopes overlooking the Godley River largely support short tussockland with scrub in gullies and on toe slopes. This scrub is often dominated by matagouri but sheltered sites support a variety of shrubs and small trees. Broadleaf and manuka were observed at one site. Associated species include *Hebe buchananii*, *Parahebe lyallii*, *Clematis marata*, porcupine shrub, bush lawyer, tutu, *Olearia avicenniifolia*, tauhinu, *Gaultheria crassa* and matagouri.

Although there are no areas of tall native forest on the property, areas of scrub with small trees exist on the lower shady slopes of gullies towards the north end of the property. The best example of this tall scrub is on the north side of Rankin Stream where dense mountain toatoa scrub grows above the river. Other small trees that form a dense canopy include mountain ribbonwood, three-finger, yellow tree daisy and mingimingi. The range slopes north of Rankin Stream are entirely scrub-covered, with a diverse mixture of species including matagouri, tauhinu, *Hebe subalpina*, inaka (*Dracophyllum uniflorum* and *D. longifolium*), *Gaultheria crassa*, mountain flax, *Olearia avicenniifolia*, *Coprosma rugosa*, mountain wineberry, and occasionally yellow tree daisy, mountain toatoa and *Olearia nummulariifolia*. Scattered throughout the scrub are large herbs including giant buttercup, *Gingidia montana* and *Celmisia semicordata*. On rock outcrops *Helichrysum intermedium*, *Parahebe lyallii*, *Blechnum penna-marina* and bristle tussock are sometimes present.

There are only very small scattered pockets of shrubland in the Mistake Valley, mainly associated with rock outcrops or small boulder-fields. Usually small pockets of stunted matagouri colonise the base of boulder-fields. However, one boulder-field on the eastern side of Mistake River is sparsely vegetated with a diverse range of shrubs including *Olearia cymbifolia*, porcupine shrub, snow totara, *Olearia odorata* (severely browsed), *Leucopogon colensoi*, *Coprosma cheesemaniae*, inaka, *Myrsine nummularia* and tauhinu. Golden spaniard, narrow-leaved snow-tussock and *Blechnum penna-marina* are also present.

Coral broom was commonly present on rubbly ground in lower Mistake Valley. However, nearly all the plants seen were severely browsed.

Rock outcrops in the lower Mistake Valley support *Helichrysum intermedium* and *Hebe buchananii*. Porcupine shrub, mountain wineberry, *Olearia odorata*, coral broom, mingimingi and *Clematis marata* are present at the base of the rock outcrops and boulder-fields.

Short tussockland

Short tussockland occupies most of the slopes and terraces below 1100m altitude. The density of fescue tussock varies from scattered plants with a high proportion of adventives, to sites where fescue tussock is dominant and most inter-tussock plants are indigenous.

Above Angus Hut fescue tussock is dominant with blue tussock and many native herbs, including patotara, *Raoulia subsericea*, *Pimelea oreophila* and the grassland buttercup (*Ranunculus multiscapus*). On lower slopes the naturalised grasses sweet vernal and browntop become more dominant, and fescue tussock becomes sparser. Mouse-ear hawkweed is present but only forms a minor component of the grassland.

Short tussockland in the southern part of the property is more modified with a higher proportion of mouse-ear hawkweed. However there is still a wide variety of small native herbs, including *Celmisia angustifolia*, patotara, *Brachyscome longiscapa*, dwarf broom, *Raoulia subsericea*, *Ranunculus multiscapus* and *Brachyglottis haastii*. The Mistake River flats are sparsely covered in fescue tussock with wetland seepages supporting sedges (*Carex* spp.) and occasionally *Gunnera dentata*. On well-drained open stony areas mats of *Raoulia tenuicaulis* and creeping pohuehue are common.

The alluvial flats in the Godley Valley are dominated by fescue tussock, with sweet vernal, browntop and moss as the main inter-tussock species. Range slopes overlooking the Godley River typically support short tussockland on the lower slopes merging into tall tussockland, rock and scree on the upper slopes. Matagouri scrub (often with *Olearia odorata* present) occupies the gullies and toe slopes.

On the gently-sloping moraines between the Cass and Mistake rivers fescue tussock becomes sparser, and naturalised species such as sheep's sorrel become more dominant.

Tall tussockland

Tall tussockland occupies the mountain slopes above about 1100m altitude, and covers approximately 30% of the total lease area. Narrow-leaved snow-tussock dominates at the lower-altitude warmer sites, and slim snow-tussock dominates at higher-altitude colder sites. This community is robust and intact at higher altitudes but somewhat depleted in places at lower altitudes. At 1200m this community typically includes narrow-leaved snow-tussock (20% cover) and mouse-ear hawkweed (40% cover). Other important inter-tussock species are patotara, fescue tussock, *Raoulia subsericea*, *Celmisia angustifolia*, *Celmisia gracilentia* and *Pimelea oreophila*. Other species occasionally present include dwarf broom, blue tussock, red woodrush, *Rytidosperma pumila*, tauhinu, *Vittadinia australis*, sweet vernal and king devil.

At higher altitudes a similar range of species is present, but with a greater cover of narrow-leaved snow-tussock (30%) and less mouse-ear hawkweed (10%).

At the head of Sutherland Creek (1500m) slim snow-tussock is dominant. Other important species present include blue tussock, *Raoulia grandiflora*, *Celmisia laricifolia*, *Celmisia lyallii* and mountain clubmoss.

Red tussock land

The most extensive area of red tussock land on the property lies on the Godley River flats between Lake Tekapo and the fans of Sutherland Creek and Big Hogget Stream. A large area of red tussock land extends well beyond the property boundary onto the Godley River flats. Small streams meander across the flats, fed by springs that emerge from the bottom of the slope. Tall dense red tussock dominates this plant community with some wetter areas dominated by bog-rush. Fescue tussock, sweet vernal and browntop grow on drier sites within the wetland. *Carex coriacea* is often present on damp ground. This extensive wetland is in very good condition with little obvious stock damage. Although sweet vernal, browntop and white clover are present the natural drainage patterns of meandering streams and seepages have not been disturbed.

Other wetlands inspected on the property were on the gently sloping moraine at the southern end of the property. All areas are small and highly modified, with considerable soil disturbance by cattle. Most wetlands are dominated by bog-rush, pasture grasses and clovers, with little or no red tussock. Developed and often irrigated paddocks usually surround the small wetland areas. The small lagoon below the homestead contains the only raupo seen on the property. However, it is surrounded by developed paddocks and large willow trees are present in and around the lagoon.

Rock and scree

Approximately 30% of the lease area is exposed rock and scree. The western lease boundary follows along the crest of the Hall Range, and the rocky peaks and ridges along this range are steep and jagged, providing the source of the long screes that descend into the valleys.

Mistake Peak at (1921m) was the highest point visited. On the exposed summit ridge, rock pavement supports a sparse vegetation of blue tussock, *Dracophyllum pronum*, *Raoulia petriensis*, *Raoulia grandiflora*, *Anisotome flexuosa*, *Scleranthus uniflorus* and *Chionohebe pulvinaris*, with scattered vegetable sheep (*Raoulia eximia*) on rock bluffs nearby. On the saddle linking the Mistake River and Sutherland Creek, gentle debris slopes support a scattering of *Ranunculus crithmifolius* and *Chionohebe pulvinaris*. On the exposed saddle is a sparse vegetation of slim snow-tussock, *Celmisia angustifolia*, *Raoulia grandiflora*, *Leucopogon fraseri*, *Kelleria dieffenbachii*, *Pentachondra pumila*, red woodrush and *Anisotome flexuosa*.

The higher slopes along the summit ridge of the Hall Range were not visited. However, alpine rock and scree is likely to support highly-specialised alpine plant communities similar to those present in the eastern part of Mt Cook National Park.

2.4.3 Notable Flora

The following species classified as threatened by Hitchmough (2002) have been recorded from the property.

Table 1 Threatened plant species recorded from Godley Peaks Pastoral Lease.

Plant Species	Known Distribution on Property
Nationally Vulnerable	
<i>Hebe cupressoides</i>	eastern slopes of Mistake Peak
Gradual Decline	
<i>Carmichaelia crassicaule</i>	scattered in lower Mistake Valley
<i>Carmichaelia vexillata</i>	scattered in tussockland
Sparse	
<i>Clematis marata</i>	scattered in low-altitude shrubland
<i>Coprosma intertexta</i>	scattered throughout low-altitude shrubland
<i>Olearia bullata</i>	scattered throughout low-altitude shrubland
Range Restricted	
<i>Hebe buchananii</i>	Godley Valley and Mistake Valley
<i>Raoulia petriensis</i>	common to abundant on Mistake Peak ridge
Data Deficient	
<i>Vittadinia australis</i>	Mistake Valley

Other notable plants observed on the property include kowhai, broadleaf and manuka (uncommon in the area), and mountain toatoa and mountain totara (important components of the original vegetation, but now uncommon).

2.4.4 Problem Plants

Introduced plants that may have a significant 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.

Crack willow (*Salix fragilis*)

Crack willow is present in and around ponds, rivers and wetlands at the southern end of the property. Willows were also abundant in lower Sutherland Creek, and along waterways in the vicinity of John Scott Lodge, threatening areas of red tussockland in the lower Godley Valley. Control or containment of these infestations may be required to protect conservation values.

Gorse (*Ulex europaeus*) and broom (*Cytisus scoparius*)

An infestation of gorse was observed on the lower hill-slopes near Angus Hut. Most of the gorse is dead but some re-growth and seedlings are present. Three young broom plants were also observed in this area. Eradication of these infestations is important, as they threaten adjoining areas of tussockland, pasture and riverbed.

Wilding pines (conifer species)

There are wind breaks and plantations of conifers on the gentle moraines at the southern end of the property. However, intensive grazing of the developed pastures that surround these plantings is likely to prevent any significant tree spread on this part of the property.

Small plantations of pines, European larch and Douglas fir are present at each of the station huts in the Godley Valley. Wilding tree spread is present at all these locations, though presently appears to be confined to the vicinity of the planted trees. An important area of spread is that of European larch onto the open riverbed near Rankin Hut in the upper valley. All spread from exotic trees in the Godley Valley should be removed. Ideally plantations in the upper valley (at Angus and Rankin huts) should be removed.

Wilding pines are also present on the steep eastern slopes of Mistake Peak above Lake Tekapo. Wilding spread is well established in this area, with some large trees present. Removal of these trees is necessary to protect conservation values, notably mountain totara remnants, populations of *Olearia bullata*, and a population of the threatened shrub *Hebe cupressoides*.

Sweet brier (*Rosa rubiginosa*)

Sweet brier is present in scrub above and below the vehicle track on the Mistake Peak faces above Lake Tekapo. This species does not appear to pose a significant threat to natural values on the property.

St John's wort (*Hypericum perforatum*)

St John's wort was observed throughout the property on low-altitude riverbeds, roadsides and tussocklands. It is very well established at disturbed sites such as recently-deposited gravels and on road verges. Control of this species would probably be difficult.

Gooseberry (*Ribes uva-crispa*)

Gooseberry was observed at several locations in low-altitude shrubland and scrub in the Godley Valley. It does not appear to be dominant at any site. Control of this species would be difficult.

Raspberry (*Rubus idaeus*)

A population of raspberry (probably planted) is present at Rankin Hut. While this species has only spread a short distance into the surrounding matagouri scrub, removal of this infestation would be prudent.

2.5 FAUNA

2.5.1 Birds and Reptiles

A total of 53 bird species were recorded on Godley Peaks Pastoral Lease: 33 indigenous (16 endemic and 17 native); 17 introduced; and, three vagrant (Tables 2 and 3). Of the indigenous birds, 13 species are classed as threatened (Table 5). Four endemic lizard species were recorded (Table 4), one of which is classed as threatened (Table 5). The lakes, wetlands and streams associated with the Godley River floodplain, the southern moraines and Mistake Valley, and the upper slopes of the Hall Range provide the most important habitats on the property for native birds. Mistake Valley and low-altitude boulder slopes throughout the property provide the most important habitats for lizards.

The main bird and lizard habitats on the property are described below for the following areas: Mistake Valley; Godley Valley floodplain and lower hill-slopes; southern wetlands; the lake terraces in the southeast corner of the property; and, the Hall Range.

Mistake Valley

The Mistake River is mostly a single-channelled river draining a valley with deeply incised terraces and steep eroding escarpments in its mid to lower reaches. The river valley provides a variety of habitat types: riverbed; small areas of open shingle; eroded terraces; rock outcrops; small tarns; wetlands; and, shrubland. One wetland, on a high terrace in middle reaches of the river, is listed as a Wetland of Regional Importance (Mistake River Swamp).

Birds

New Zealand pipit, Australasian harrier, South Island pied oystercatcher, paradise shelduck, spur-winged plover, black shag, grey duck, grey teal, southern black-backed gull and a group of seven black-fronted terns were recorded in the middle reaches of the valley. Grey warbler and silvereye were present in the lower reaches.

Lizards

Lizards were numerous among the rock outcrops on the high terraces and hill-slopes in the middle reaches of the valley. Two spotted skinks, four common geckos "Southern Alps", and several common and McCann's skinks were recorded on a high terrace on the true right of the river. The eroded terraces, scree slopes, dry stream-gullies and riverbed provide suitable habitat for scree skink and long-toed skink but neither species was recorded during this brief survey. Common and McCann's skinks were found among tussock and rocks in a small tributary valley, and common skink and common gecko were also found among rock and scree just above the vehicle track on the true left of the river.

Godley Valley floodplain and lower hill-slopes

This area contains diverse habitats: shrubland; boulder-field; mountain totara forest remnants; *Carex* and red tussock wetlands; streams; and, riverbed. The river floodplain between Ribbonwood and Sutherland creeks is a SSWI of "outstanding" value to wildlife (Godley River Wetland). Species recorded in this area include black stilt, black-fronted tern, wrybill, black-fronted dotterel and marsh crake (Jarman, 1987).

Birds

New Zealand pipit, Australasian harrier, South Island pied oystercatcher, spur-winged plover, banded dotterel, paradise shelduck, grey teal, southern black-backed gull, black-fronted tern and eastern falcon were observed during this survey. Grey warbler and silvereye were present in shrubland.

Lizards

Common gecko "Southern Alps" was recorded at three locations: among boulders on eroding northeast-facing terraces just north of Rankin Hut; among rocks at the toe of a scree slide approximately two kilometres south of Rankin Hut; and, on a boulder-field on a hill-slope just below the Godley Delta near the *Hebe cupressoides* site. A common/McCann's skink was recorded in matagouri shrubland.

Other species

Several *Brachaspis* "Hunter" grasshoppers were found in two locations: the outwash gravel of Rankin Stream and outwash boulders from a small steep stream just north of Rankin Stream. The former were found on the stream bed amongst willowherbs (*Epilobium* sp.), fescue tussock, tutu and mat daisies (*Raoulia* sp.). The latter were on a site above the Godley River floodplain amongst creeping pohuehue, fescue tussock, matagouri and *Blechnum penna-marina*.

Southern wetlands

Two wetlands were examined during this survey: Rapuwai Lagoon (also known as Lakeside Lagoon or Raupo Lagoon) and an unnamed pond with raupo wetlands immediately behind the homestead. Additional wetlands present in this part of the property are Micks Lagoon and the Homestead Pond. These wetlands are surrounded by grazed and developed farmland. Micks Lagoon and Rapuwai Lagoon are listed as SSWIs of “outstanding” value to wildlife (Jarman, 1987). Homestead Pond is listed as a WERI (DOC database). Micks Lagoon is public conservation land and is fenced off from stock. Rapuwai lagoon and the unnamed pond behind the homestead are partially fenced though are accessible to stock.

Birds

Micks Lagoon is described as excellent nesting habitat for waterfowl, especially grey teal and New Zealand scaup. Juvenile black stilt are released at Micks Lagoon and adult black stilt and marsh crake breed at the site. Australasian bittern and wrybill are also present (Jarman, 1987). Eastern bar-tailed godwit, pectoral sandpiper, white-winged black tern and chestnut-breasted shelduck have also been recorded (Jarman, 1987; Simon Elkington, *pers. comm.*) along with a variety of non-threatened indigenous wetland birds.

Rapuwai lagoon is described as best raupo habitat in the Mackenzie Ecological Region (Jarman, 1987). Banded dotterel, Australasian bittern and white-winged black tern have been recorded. New Zealand scaup and marsh crake have been recorded on Homestead Pond. During this survey New Zealand shoveler were recorded in Rapuwai Lagoon, and New Zealand scaup, black swan, shining cuckoo and grey warbler were recorded at the unnamed pond.

Lake terraces in the southeast corner of the property

Northeast-facing lake terraces just east of Micks Lagoon support matagouri and native broom with a ground-cover of fescue tussock, mat daisies (*Raoulia* spp.), sand and stones. These terraces provide good lizard habitat: common and McCann’s skink were recorded, and three common geckos were found.

Hall Range

The upper slopes of the Hall Range were not visited, but are likely to provide important habitat for two threatened bird species: kea and rock wren (McEwen, 1987). Kea have been recorded from the area (Bull *et al.*, 1985), and rock wren are present in the mountains of Mt Cook National Park, just west of the property. Another threatened species, blue duck, has been recorded from the upper Godley Valley (Cunningham, 1991) but is unlikely to be present on the property.

Table 2 Indigenous bird species recorded from Godley Peaks Pastoral Lease.

Bird species		Known Distribution on Property
Common name	Scientific name	
black shag	<i>Phalacrocorax carbo novaehollandiae</i>	throughout
little shag*	<i>P. melanoleucos brevirostris</i>	Micks Lagoon; Cass and Godley rivers
white-faced heron*	<i>Ardea novaehollandiae</i>	throughout in rivers and wetlands
Australasian bittern*	<i>Botaurus poiciloptilis</i>	Micks Lagoon; Rapuwai Lagoon
black swan	<i>Cygnus atratus</i>	unnamed pond behind homestead
paradise shelduck	<i>Tadorna variegata</i>	throughout
chestnut-breasted shelduck*	<i>T. tadornoides</i>	Micks Lagoon
grey duck	<i>Anas superciliosa superciliosa</i>	wetlands; Cass and Godley rivers
grey teal	<i>A. gibberifrons</i>	wetlands; Mistake, Cass and Godley rivers
New Zealand shoveler	<i>A. rhynchotis</i>	Micks and Rapuwai lagoons; Cass and Godley rivers
New Zealand scaup	<i>Aythya australis</i>	Micks Lagoon; unnamed homestead pond
Australasian harrier	<i>Circus approximans</i>	throughout
eastern falcon	<i>Falco novaeseelandiae "eastern"</i>	throughout
marsh crane*	<i>Porzana pusilla affinis</i>	Godley River wetland; Micks and Rapuwai lagoons; Homestead Pond
pukeko*	<i>Porphyrio porphyrio</i>	Micks Lagoon
pied oystercatcher	<i>Haematopus ostralegus finschi</i>	throughout
spur-winged plover	<i>Vanellus miles</i>	throughout
pied stilt*	<i>Himantopus himantopus</i>	wetlands; Cass and Godley rivers
black stilt*	<i>H. novaeseelandiae</i>	Micks Lagoon; Cass and Godley rivers, Godley River Wetland
banded dotterel	<i>Charadrius bicinctus</i>	Cass and Godley rivers; depleted grasslands; Godley River Wetland
wrybill*	<i>Anarhynchus frontalis</i>	Micks Lagoon; Cass and Godley rivers, Godley River Wetland
black-backed gull	<i>Larus dominicanus</i>	throughout
black-billed gull*	<i>L. bulleri</i>	Micks Lagoon; Cass and Godley rivers
black-fronted tern	<i>Sterna albobstriata</i>	wetlands; Mistake, Cass and Godley rivers
Caspian tern*	<i>S. caspia</i>	Cass and Godley rivers
shining cuckoo	<i>Chrysococcyx lucidus</i>	unnamed homestead pond
kingfisher	<i>Halcyon sancta vagans</i>	road bridge on Cass River
welcome swallow*	<i>Hirundo tahitica</i>	rivers; wetlands
New Zealand pipit	<i>Anthus novaeseelandiae novaeseelandia</i>	throughout
grey warbler	<i>Gerygone igata</i>	shelterbelts; shrubland
fantail*	<i>Rhipidura fuliginosa fuliginosa</i>	shelterbelts; shrubland
tomtit*	<i>Petroica macrocephala</i>	shrubland; plantations
silvereeye	<i>Zosterops lateralis</i>	shelterbelts; shrubland

*Recorded previously (Jarman, 1987; Elkington, *pers.comm.*) but not recorded November 2002.

Table 3 Introduced bird species recorded from Godley Peaks Pastoral Lease, November 2002.

Bird species	
Common name	Scientific name
Canada goose	<i>Branta canadensis</i>
mallard	<i>Anas platyrhynchos</i>
chukor	<i>Alectoris chukar</i>
California quail	<i>Callipepla californica</i>
rock dove	<i>Columbia livia</i>
skylark	<i>Alauda arvensis</i>
dunnock	<i>Prunella modularis</i>
song thrush	<i>Turdus philomelos</i>
blackbird	<i>T. merula</i>
starling	<i>Sturnus vulgaris</i>
house sparrow	<i>Passer domesticus</i>
chaffinch	<i>Fringilla coelebs</i>
redpoll	<i>Carduelis flammea</i>
goldfinch	<i>C. carduelis</i>
greenfinch	<i>C. chloris</i>
yellowhammer	<i>Emberiza cintrarella</i>
Australian magpie	<i>Gymnorhina tibicen</i>

Table 4 Endemic lizard species recorded from Godley Peaks Pastoral Lease, November 2002.

Lizard species		Known Distribution on Property
Common name	Scientific name	
common gecko	<i>Hoplodactylus</i> aff. <i>maculatus</i> "Southern Alps"	throughout: under rocks and among talus
spotted skink	<i>Oligosoma lineoocellatum</i>	rocks outcrops; Mistake River terraces
McCann's skink	<i>O. maccanni</i>	throughout
common skink	<i>O. nigriplantare polychroma</i>	throughout

2.5.2 Freshwater Fauna

Freshwater fauna communities were surveyed at 18 sites on Godley Peaks Pastoral Lease, along the Cass, Mistake and Godley rivers, and at a series of springs and wetlands associated with these rivers. Five different fish species, including three native species, and a wide range of aquatic macro-invertebrates, including insect larvae, crustaceans, molluscs and worms, were observed on the property.

Seven different aquatic habitat types are present on this property. These are classified by water source, resistance to drying, and surrounding landform structure. Of these, five are flowing-water habitats and three are still-water habitats. Native fish were found in all habitat types, except for the springs in Mistake Valley. The native fish communities on the property were not as diverse as expected, but many of the streams had to be surveyed at accessible locations, rather than in areas of optimum habitat. No threatened fish species were found, although two

threatened fish species (upland longjaw galaxias and longfin eel) have been recorded in the area previously.

Macro-invertebrate fauna on Godley Peaks Pastoral Lease was quite diverse, with many of the habitats showing high diversity, notably the tributary streams of the Mistake and Godley rivers.

One of the distinguishing features of the Waitaki River and its tributaries is the hydroelectric dams that are found along its length. This has two major effects on the fish communities within the river. The first is that fish communities above the dams are generally composed of only non-diadromous species (those species without a marine phase in their lifecycle), although some exceptions do occur: some longfin eels (*Anguilla dieffenbachii*) are still present in the river system; and, the normally diadromous common bully (*Gobiomorphus cotidianus*) and koaro (*Galaxias brevipinnis*) have become non-diadromous, substituting lakes for the sea. The second effect is that the fish communities are divided into separate populations, with little or no migration across dams. This means that any re-colonisation of previously de-watered streams can only occur within each dam catchment.

Above the Waitaki Dam, only 11 fish species are present, including five species of introduced salmonid, four species of galaxiid and two species of bully. Of these, chinook salmon (*Oncorhynchus tshawytscha*), sockeye salmon (*O. nerka*) and brook char (*Salvelinus fontinalis*) are scarce and only associated with Lake Aviemore, Lake Benmore and Lake Ohau. The other eight species are quite widely distributed in the Waitaki catchment.

Freshwater fish species previously recorded (in the New Zealand Freshwater Fish Database) in the vicinity of Godley Peaks Pastoral Lease (Cass and Godley rivers and Micks Lagoon) are: koaro, Canterbury galaxias (*Galaxias vulgaris*), alpine galaxias (*G. paucispondylus*), upland longjaw galaxias (*G. prognathus*), common bully, upland bully (*Gobiomorphus breviceps*), longfin eel, brown trout (*Salmo trutta*) and rainbow trout (*Oncorhynchus mykiss*). Of these, upland longjaw galaxias and longfin eel are listed as threatened by Hitchmough (2002).

Habitat Types

The seven habitat types associated with freshwater communities on Godley Peaks Pastoral Lease are described below.

Wetlands

The most important wetlands in the area lie outside the pastoral lease boundary: Micks Lagoon (public conservation land); Rapuwai Lagoon; and, a wetland near the homestead (Godley Peaks freehold). The wetlands vary in the quality of habitat: Micks Lagoon is quite pristine, being fenced off and having some native plantings; but Rapuwai Lagoon and the wetland near the homestead are quite degraded with some stock access and a dominance of introduced vegetation.

Drained Wetlands

One small wetland near the homestead has been recently drained and is in the final stages of drying up. This area is completely degraded, dominated by pine trees and pasture, and is accessible to stock.

Springs

There are numerous springs along the Godley River and several on the terraces above the Mistake River. Springs in the Godley Valley are all connected to the main river, whereas the springs on the Mistake Valley terraces are isolated, generally drying up before reaching the river. All of the springs surveyed were accessible to stock. Most springs are located in tussockland, though pasture species are also present.

Godley River Streams

The tributary streams of the Godley River are of two types, as a result of landform structure rather than stream size:

- A. "Rapid Descent Streams" originate at high altitudes and flow down steep slopes forming large waterfalls. Stream sides at lower altitudes are generally surrounded by pasture. Pikes Peak Stream has a small pool where the stream reaches a terrace created by the Godley River floodplain. This pool is 30m long and over 2m deep.
- B. "Slow Descent Streams" originate at greater distances from the Godley River, so have fewer waterfalls. Stream sides support shrubland and pasture.

Mistake River Streams

The Mistake Valley can be divided into three sections based on vegetation and landform:

- A. The "Lower River System" is fast flowing, almost torrential, with a long reach of steeper gradient. Nearer Lake Tekapo the gradient eases but the river still maintains a large fast flow.
- B. The "Upper River System" is gentler where the river flows across extensive flats with separate channels cutting through the areas of tussock and pasture. The side channels are quiet, meandering across the valley, whereas the main flow is quite fast.
- C. The "Tributary Streams" are all the smaller side-streams of the river. Those on the true left are minimal, generally drying up before joining the main river, whereas those on the true right have permanent flows right to the river. These streams mostly flow through tussockland.

Artificial Water-Races

A water-race on the property originates from the Mistake River, flowing past the homestead and into the Cass River. It flows through sown pasture and a pine plantation with only sporadic patches of native vegetation along its length. It is accessible to stock, except for a fenced section near the homestead.

Braided Rivers

Braided sections of the Cass and Godley rivers border the property. These areas are mostly Unalienated Crown Land (UCL), but are closely associated with lower-altitude parts of the property.

Fish

Two fish species were recorded in Rapuwai Lagoon: upland and common bully. Other wetlands in the area, such as Micks Lagoon, are likely to support similar fish populations. No fish were observed in the springs on the terraces above the Mistake River, however springs in the Godley Valley support a number of fish. Of those surveyed, one was found to contain more than 64 koaro in a small 3 m² area, and another contained koaro and common bully. Records in the NZ Freshwater Fish Database indicate that several other native species are likely to be present in the Godley Valley springs, including upland bully, upland longjaw galaxias, alpine galaxias and Canterbury galaxias.

No Rapid Descent Streams were surveyed, but the reaches from the base of each waterfall to the Godley River show characteristics similar to some of the Slow Descent Streams. The Slow Descent streams were found to contain only koaro, although only sections close to the vehicle track were surveyed. Alpine galaxias, upland longjaw galaxias and Canterbury galaxias are likely to be present in the upper reaches of these streams.

Four species of fish were observed in the Mistake River waterways. The lower river system contained upland bully, koaro, rainbow trout and brown trout. The upper river flats contained salmonids: one rainbow trout was caught; and, one large salmonid seen. Other species of native fish are expected to occur in low numbers in these habitats, possibly Canterbury galaxias in the lower river system and upland bully in the upper river flats. The tributary streams above the Mistake River contained brown trout and koaro. Brown trout were found near the Mistake

River and koaro found at higher altitudes above the river. Koaro in the tributaries were larger than those observed in the main river.

No fish were observed in the artificial water-race. A holding tank near Mistake River, and the series of wetlands that it flows through at the downstream end, probably have a screening effect, keeping fish out of this system. Koaro were observed in the Cass River, and the NZ Freshwater Fish Database contains records of common and upland bully, upland longjaw galaxias and Canterbury galaxias.

Aquatic macro-invertebrates

No wetlands were surveyed for aquatic macro-invertebrates, however they are expected to be dominated by groups such as cased caddisflies, snails (numerous large *Lymnaea* species (snails) were seen in Rapuwai Lagoon), and Hemiptera and Odonata species. The only spring surveyed was in the Godley Valley. Quite a high diversity of macro-invertebrates was found, compared to some of the other habitats surveyed: cased caddisflies (*Beraeoptera roria*, *Olinga feredayi*, *Pycnocentria evecta* and *Pycnocentrodes aeris*) were common, however, numerically dominant were Diptera (*Diamesinae* spp. and *Orthocladinae* spp.) and snails (*Potamopyrgus* spp.). The other Godley River springs are likely to contain similar communities, as will the springs above Mistake River.

The Slow Descent Streams along the Godley River were found to have quite low macro-invertebrate diversity with the exception of Pollock Stream, which had the highest diversity of all of the streams sampled. The two *Deleatidium* groups (*lillii*- and *myzobranhia*-groups) and the worms (*Oligochaete* spp. and *Nematode* spp.) were the only species in common between all of those surveyed. One of the reasons for this is the temporal nature of these streams as their flow varies due to seasonal snow-melt. Pollock Stream was still dominated by these species, but also contained *Nesameletus* spp. in reasonable numbers. All of the other macro-invertebrate species present in Pollock Stream were very low in density. No Rapid Descent Streams were surveyed, but the lower sections are expected to be similar to the Slow Descent Streams.

The Mistake River streams contained diverse macro-invertebrate fauna, although the Lower River System proved the exception with few species present, and dominated by the *Deleatidium lillii*-group. The Upper River Flats were not surveyed, but because of the stable nature of some of the side channels, they would be expected to support a diverse macro-invertebrate fauna, with cased caddisflies and snails present, but also a selection of other macro-invertebrate groups. The Tributary Streams showed good diversity although no species was dominant in either of the streams surveyed. The *Deleatidium* groups (*lillii*- and *myzobranhia*-groups) were present, as were the *Nesameletus* spp., *Eriopterini* spp. and a variety of Diptera (*Chironominae* spp. and *Diamesinae* spp.).

The Artificial Water-Race, while not particularly diverse, did have some species not found in any of the other macro-invertebrate survey sites on the property, including a beetle (*Ptilodactylidae* sp.) and a cased caddisfly (*Oeconesus* sp.). The Cass River was not surveyed but is expected to have a similar macro-invertebrate community to other braided rivers.

2.5.3 Invertebrates

Invertebrates were sampled from five main habitats on Godley Peaks Pastoral Lease: alpine/subalpine; shrubland; open tussockland; river/wetland; and, stonefield (riverbed). Three notable invertebrate species were observed: the speargrass weevil (*Lyperobius huttoni*); the grasshopper *Brachaspis* "Hunter"; and, the grasshopper *Sigauss minutus*. Invertebrate communities of the property are described below for each of the main habitats sampled.

Alpine and Sub-alpine

Weather precluded effective sampling of high alpine habitats though a range of common species were observed in low-alpine and sub-alpine habitats. The Hall Range, especially the relatively unmodified high-altitude habitats, supports a diverse invertebrate fauna. Two alpine grasshopper/kawhitiwhiti species were collected above 1300m: *Sigauss australis* in tall tussockland and *Brachaspis* "Hunter" on rockfield and scree. The speargrass weevil (*Lyperobius huttoni*) was collected near Mistake Peak. Several black cicada (*Maoricicada* species) were observed on scree. High alpine insects such as centipedes (Chilopoda), weevils (Curculionidae) and cockroaches (Blattidae) are also present.

Shrubland

Three main types of shrubland were observed on the property: dense mixed shrubland with small patches of mountain toatoa on the east face of Mistake Peak; ribbons of matagouri or *Olearia* shrubland alongside low-altitude streams and on fans; and, inaka-dominated sub-alpine shrubland at the northern end of the property. All areas of shrubland appear to be in good condition and support healthy invertebrate populations.

Shrublands on the east face of Mistake Peak are likely to support the most diverse invertebrate populations, including species of cockroach, ground beetle (Carabidae), darkling beetle (Tenebrionidae), weevil, springtail (Arthropleona), centipede, millipede (Diplopoda) and flatworm (Geoplanidae). Areas of gravelfield and rock outcrop within these shrublands are likely to support species of cockroach, centipede, millipede and spider (Araneae). Small areas of grassland within these shrublands support species of grasshopper (Acrididae), fly (Diptera), cockroach, moth and butterfly (Lepidoptera), and ant, wasp and bee (Hymenoptera). The range of shrub daisy (*Olearia*) species (*O. odorata*, *O. bullata*, *O. nummulariifolia*, *O. cymbifolia*, *O. avicenniifolia*) present in these shrublands is likely to enhance their importance for Lepidoptera, as these shrub species provide habitats for a rich moth fauna (Patrick, 2000).

Tussockland

Several moth and butterfly species were observed in tussockland on the property, including the tussock ringlet butterfly (*Argyrophenga antipodum*), red admiral butterfly (*Bassaris gonerilla gonerilla*), southern blue butterfly (*Zizina otis oxleyi*), and species of copper butterfly (*Lycaena* spp.). Diurnal moths (Lepidoptera) were plentiful. The rare grasshopper *Sigauss minutus* was collected on the southern end of the Hazienda Range at 1180m: the highest recorded site for this species. Common species of invertebrate were observed in more modified low-altitude grasslands.

Rivers and Wetlands

High-altitude flush complexes, such as that at the head of Sutherland Creek, appear in good condition and are likely to support a diverse range of invertebrates, including species of crane fly (Tipulidae), caddisfly (Trichoptera), Hemiptera and ground beetle (Carabidae). Many of the streams on the east face of Pikes Peak flow over waterfalls before reaching the Godley River.

These streams support a diverse community of aquatic insects including species of caddisfly, mayfly (Ephemeroptera), dobsonfly (*Archichauliodes diversus*) and stonefly (Plecoptera). The yellow spotted dragonfly (*Procordulia grayi*) was observed near Rankin Hut.

There are three principal areas of wetland in the vicinity of the lower Cass River fan. All three are substantially modified, and only support common invertebrate species.

Stonefield (riverbeds)

Old moss- and lichen-covered alluvial fans in the Godley Valley between Pollock and Rutherford streams support an extremely rich and diverse invertebrate fauna. Diurnal moths were abundant and many species appear to be well represented. Other invertebrate species were common, including species of wasp (Hymenoptera), fly (Diptera), ant (Formicidae), beetle and weevil (Coleoptera).

2.5.4 Notable Fauna

The following species classified as threatened by Hitchmough (2002) were observed on the property.

Table 5 Threatened fauna recorded from Godley Peaks Pastoral Lease.

Animal Species Common name	Scientific name	Known Distribution on Property
Nationally Critical black stilt	<i>H. novaeseelandiae</i>	Micks Lagoon; Cass and Godley rivers, Godley River Wetland
kea	<i>Nestor notabilis</i>	Likely to be present on Hall Range
Nationally Endangered Australasian bittern	<i>Botaurus poiciloptilis</i>	Micks Lagoon; Rapuwai Lagoon
Nationally Vulnerable wrybill	<i>Anarhynchus frontalis</i>	Micks Lagoon; Cass and Godley rivers, Godley River Wetland
Caspian tern	<i>Sterna caspia</i>	Cass and Godley rivers
rock wren	<i>Xenicus gilviventris</i>	Likely to be present on Hall Range
Serious Decline grey duck	<i>Anas superciliosa</i> <i>superciliosa</i>	wetlands; Cass and Godley rivers
black-billed gull	<i>L. bulleri</i>	Micks Lagoon; Cass and Godley rivers
black-fronted tern	<i>Sterna albostrata</i>	wetlands; Mistake, Cass and Godley rivers
Gradual Decline eastern falcon	<i>Falco novaeseelandiae</i> "eastern"	throughout
banded dotterel	<i>Charadrius bicinctus</i>	Cass and Godley rivers; depleted grasslands; Godley River Wetland
longfin eel	<i>Anguilla dieffenbachii</i>	likely to be present
alpine grasshopper	<i>Sigauss minutus</i>	Hall Range
Sparse black shag	<i>Phalacrocorax carbo</i> <i>novaeollandiae</i>	throughout
marsh crane	<i>Porzana pusilla affinis</i>	Godley River wetland; Micks and Rapuwai lagoons; Homestead Pond
upland longjaw galaxias	<i>Galaxias prognathus</i>	likely to be present
Range Restricted grasshopper	<i>Brachaspis</i> "Hunter"	Hall Range

2.5.5 Problem Animals

Introduced animals that may have a significant effect on indigenous plant communities on the property, and for which control or containment is practical, are discussed below. Other ubiquitous naturalised species are not listed.

Rabbits, hares and possums were observed on Godley Peaks Pastoral Lease. Red deer, chamois and tahr are also likely to be present. Of these species, rabbits and tahr pose the greatest threat: the former in drier habitats such as the open riverbeds; and the latter in high-altitude tussocklands. Control of rabbits and tahr may be required to protect the natural values of areas set aside as public conservation land. The northern part of the property lies within Management Unit 3 of the Department of Conservation's Himalayan Thar Control Plan (1993). That plan proposes a maximum population density of two tahr per km² in Management Unit 3, and presumably a zero density in southern parts of the property that lie outside the management units.

2.6 HISTORIC RESOURCES

Godley Peaks was originally called The Mistake and the first run holder was Thomas Williamson Hall. Pinney (1971) explains that his mistake was to pick a run with no suitable homestead site. He had originally applied for part of what became Glenmore Station however when he arrived to take possession he found this land was already taken, his amended description was dated 3 May 1859.

Hall sold to Smith and Saunders on the 20 August 1867. This period was notable for the conflict between William Sibbald of Lilybank Station over land boundaries. Nicolo Radove from Birch Hill took over the property in 1875 and endured 10 years of very hard times, heavy snows and low prices. By 1885 a mortgagee sale forced Radove off and John, Robert and Edmund Rutherford became the new owners. Between 1889 and 1912 further heavy snows, huge stock losses and rabbit problems drove several attempts to sell without success. However in 1912 Alexander MacRae became the new leaseholder. It was in this period that Godley Peaks was first used as the property name. Further changes of hands saw Bruce Murrey take over in 1922, Donald Burnett, John Ballantyne and John William Simpson in 1937 and in 1944 John Scott. Godley Peaks Station (1996) Limited was the new leaseholder in 1996 and in August 2001 LSF Holdings Limited took over.

The raising of Lake Tekapo, the flooding of the lower Godley valley and the surrender of part of the land for soil and water conservation purposes have reduced the property land size from approximately 23,627 ha in 1951 to the current 14,493ha.

2.7 PUBLIC RECREATION

2.7.1 Physical Characteristics

Access to the valley is primarily by a 4WD farm track that traverses the valley from the Cass River to just beyond Rankin Stream. This access takes some 2-3 hours by 4WD and can be difficult. The access track is only on the legal road for the first few kilometres to just beyond the homestead. From the yards the legal access and formed track are often parallel to one another and are just metres apart. Access into the Mistake Valley is via farm tracks on either side of the Mistake River. Access up the Cass from Godley Peaks is not particularly practical as the slopes of the Haszard Ridge drop of steeply into the Cass River opposite Cass Valley wetland on Glenmore

2.7.2 Legal Access

Practical legal access to the property is via Godley Peaks Road. There is a legal road which runs along the shore of Lake Tekapo and up to the Godley River, however in places this is under water and so does not provide practical access. A legal road traverses the lower flats through the property and runs up the Godley Valley. This legal road does not follow the formed farm track, although it is very close to it. A legal road runs up the Mistake valley on the true right terrace of Mistake River, but this is not linked to another legal access points. The status check also indicates on an early title that s.58 strips were meant to be laid off along all the creeks and rivers. However the current situation is unclear.

2.7.3 Activities

The Godley Valley has been an area of high recreational interest for a number of years. It's an access point to the public conservation land beyond and Mt Cook National Park. Activities have mainly included tramping, climbing and shooting. Property huts have been utilised by these groups as they provide excellent bases for access into the adjoining hinterland. The Hall Range, Mistake Valley are key attractions as well as the side valleys and basins. Access into upper valley by vehicles is through the middle of the property and is normally by permission only. This permission is seldom denied unless for climatic or stock management reasons.

Timaru Boys High School has a camp at Sutherlands Hut in a disused woolshed that has been modified. This facility is used for the schools outdoor activities.

PART 3 OTHER RELEVANT MATTERS AND PLANS

3.1 CONSULTATION

Early-warning consultation meetings were held in Timaru on the 10th September 2002 and in Christchurch on the 11th December 2002. Representatives of the following organisations were present at these meetings: NZ Four Wheel Drive Association, Canterbury Four Wheel Drive Association, Canterbury University Tramping Club, Canterbury Botanical Society, Peninsula Tramping Club, NZ Deerstalkers Association, Federated Farmers High Country Committee, Public Access NZ, South Canterbury Tramping Club, Temuka Tramping Club and Federated Mountain Clubs of NZ.

Issues raised by representatives included:

- A large area on the northern boundary of the property should be retained by the crown.
- The lessee has been upset by people going through the property.
- There are chukor-shooting opportunities on the property.
- There is black stilt habitat around Micks Lagoon and other lagoons.
- The legal road up the Godley Valley needs investigating.
- Legal access to the high school lodge (John Scott Lodge) needs to be defined to safeguard future access.
- The legal road is not contiguous in Mistake Valley and needs to be defined so that legal access is available.
- The rare *Ranunculus godleyanus* and a number of rare species of *Hebe* are present in the Godley Valley, possibly on public conservation land.
- There are concerns as to whether marginal strips have been laid off.
- People want assurances that there are marginal strips along both sides of the Mistake River up to the public conservation land boundary.
- There needs to be legal practical road access up the Cass River.

3.2 DISTRICT PLANS

Godley Peaks pastoral lease lies within the Mackenzie District. The Proposed District Plan, as amended by Council decisions, was notified in September 1999.

Under this plan Godley Peaks pastoral lease is zoned Rural. The schedule of Sites of Natural Significance in the Proposed Plan identifies Micks Lagoon (site 65) and Lake Tekapo (56), Cass River (66) and Godley River (67).

The Proposed District Plan contains a number of rules relating to land use activities within sites of natural significance, within riparian areas and in the high altitude areas (ie areas above 900m).

3.3 CONSERVATION MANAGEMENT STRATEGIES

Godley Peaks pastoral lease lies in the CMS unit known as Waitaki. The key priorities for this unit are:

- -to identify, maintain and seek to enhance the natural landscape values of the unit – through appropriate methods such as tenure review and district plans.
- -to identify the significant native vegetation and threatened species of the unit and to use a range of effective methods to protect a representative range of indigenous biodiversity of the unit as well as protecting and enhancing the viability of priority threatened species populations and their habitats in the unit.
- -for recreation and access the Conservancy's objectives are 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, and to liaise with adjacent landholders to resolve conflicts over access for recreation to land managed by the Department.
- -to reduce and maintain rabbit and thar densities to levels that ensure their adverse effects on natural values are minimised.

Other priorities identified in the CMS that are conservancy wide and relevant to tenure review on these properties are – to undertake necessary actions to secure the conservation of category A and B species, including predator control, fencing and habitat protection. The species listed as priority include *Carmichaelia curta*, the robust grasshopper, scree skink, long-toed skink, black fronted tern and banded dotterel.

PART 4 ATTACHMENTS

4.1 ADDITIONAL INFORMATION

4.1.1 Scientific Names of Plant Species Cited in the Text

Common name..... Scientific name

(* = naturalised species)

blue tussock	<i>Poa colensoi</i>
bog-rush	<i>Schoenus pauciflorus</i>
bristle tussock	<i>Rytidosperma setifolium</i>
broadleaf	<i>Griselinia littoralis</i>
broom*	<i>Cytisus scoparius</i>
browntop*	<i>Agrostis capillaris</i>
bush lawyer	<i>Rubus schmidelioides</i>
clovers*	<i>Trifolium</i> spp.
coral broom	<i>Carmichaelia crassicaule</i>
creeping pohuehue	<i>Muehlenbeckia axillaris</i>
Douglas fir*	<i>Pseudotsuga menziesii</i>
dwarf broom	<i>Carmichaelia vexillata</i>
European larch*	<i>Larix decidua</i>
fescue tussock	<i>Festuca</i> sp.
giant buttercup	<i>Ranunculus lyallii</i>
golden spaniard	<i>Aciphylla aurea</i>
gooseberry*	<i>Ribes uva-crispa</i>
inaka	<i>Dracophyllum uniflorum</i>
king devil*	<i>Hieracium praealtum</i>
korokio	<i>Corokia cotoneaster</i>
koromiko	<i>Hebe salicifolia</i>
kowhai	<i>Sophora microphylla</i>
lotus*	<i>Lotus pedunculatus</i>
manuka	<i>Leptospermum scoparium</i>
matagouri	<i>Discaria toumatou</i>
mingimingi	<i>Coprosma propinqua</i>
mountain clubmoss	<i>Lycopodium fastigiatum</i>
mountain flax	<i>Phormium cookianum</i>
mountain ribbonwood	<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>
native jasmine	<i>Parsonsia capsularis</i>
patotara	<i>Leucopogon fraseri</i>
pohuehue	<i>Muehlenbeckia australis</i>
porcupine shrub	<i>Melicactus alpinus</i>
raspberry*	<i>Rubus idaeus</i>

raupo	<i>Typha orientalis</i>
red tussock	<i>Chionochloa rubra</i>
red woodrush	<i>Luzula rufa</i>
scrub pohuehue	<i>Muehlenbeckia complexa</i>
sheep's sorrel*	<i>Rumex acetosella</i>
silver beech	<i>Nothofagus menziesii</i>
silver tussock	<i>Poa cita</i>
slim snow-tussock.....	<i>Chionochloa macra</i>
snowberry	<i>Gaultheria depressa</i> var. <i>novae-zelandiae</i>
snow totara.....	<i>Podocarpus nivalis</i>
snow tussock.....	<i>Chionochloa</i> spp.
St John's wort*	<i>Hypericum perforatum</i>
sweet brier*.....	<i>Rosa rubiginosa</i>
sweet vernal*	<i>Anthoxanthum odoratum</i>
tauhinu	<i>Ozothamnus leptophyllus</i>
three-finger	<i>Pseudopanax colensoi</i>
tutu	<i>Coriaria sarmentosa</i>
weeping matipo.....	<i>Myrsine divaricata</i>
white clover*	<i>Trifolium repens</i>
willow*	<i>Salix</i> spp.
yellow tree daisy.....	<i>Brachyglottis cassinioides</i>

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4.2 ILLUSTRATIVE MAPS