Toitu te whenua
Land Information
New Zealand

Crown Pastoral Land Tenure Review

Lease name : LONG GULLY

Lease number : PO 055

Conservation Resources Report - Part 1

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

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

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

December 05

DOC CONSERVATION RESOURCES REPORT ON TENURE REVIEW OF

LONG GULLY PASTORAL LEASE (P 55)

UNDER PART 2 OF THE CROWN PASTORAL LAND ACT 1998

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DOC CONSERVATION RESOURCES REPORT ON TENURE REVIEW OF LONG GULLY PASTORAL LEASE (P 55) UNDER PART 2 OF THE PASTORAL LAND ACT 1998

PART 1 INTRODUCTION

The Lessees of the Long Gully Pastoral Lease (PL) have applied to the Commissioner of Crown Lands for a review of the property's pastoral lease tenure.

The 1703 ha Long Gully PL is located on the eastern side of the Upper Clutha /Mata-au River Valley. The PL extends from the Clutha/Mata-au River across alluvial fans and outwash terraces into the south eastern end of the Grandview Range. The Grandview Range is a minor range which runs southward from the SE side of Lake Hawea and forms part of the eastern enclosing range of the Upper Clutha Valley.

The PL ranges in elevation from approximately 240m near the Clutha /Mata-au River to a minor peak of 1178m above Long Gully, in the NE area of the PL. West of the Grandview Range ridge, the pastoral lease area drains to the Clutha /Mata-au River. East of the ridge the area drains eastwards to the Lindis River. The homestead is on the Luggate - Tarras Road approximately 10 km north of Tarras.

Long Gully PL is in the Lindis Ecological District which is part of the Central Otago Ecological Region. A Protected Natural Areas Programme survey report was completed for this ecological district (Grove, 1995). Two recommended areas for protection (RAP'S) were identified on the PL. These are Lindis RAP 13 and Lindis RAP 14.

Long Gully PL was inspected between 31 March and 2 April 2003 by a team of specialists. Their findings have been included in this report.

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

2.1 LANDSCAPE

For this assessment, Long Gully Pastoral Lease has been divided into three landscape units (LU) as shown on Map Three.

- Clutha /Mata-au River Flats (LU1)
- Clutha Valley Faces (LU2)
- Long Gully Valley (LU3)

The boundaries of each unit are defined principally by changes in topography, aspect and ground cover. Each landscape unit is defined, and a description of landscape character in terms of landform, land cover and land use is given. An assessment of landscape values is made using the following criteria:

- Naturalness –an expression of the degree of 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 physical processes are.
- Aesthetic values –includes the concepts of memorability and naturalness. Aesthetic factors that can make a particular landscape vivid include simplicity in landform, muted colours and fine textured ground cover.
- Historical values – areas containing high heritage importance.

Visual values or "visual amenity" is described and an assessment of each landscape unit's vulnerability to change is made.

2.1.1 (LU1) Clutha /Mata-au River Flats

Description

This unit comprises outwash flats and terraces associated with the broad U-shaped Upper Clutha /Mata-au River Valley. The unit has been divided into three areas for descriptive purposes. These differ slightly in character, but read as one landscape unit.

LU1a lies adjacent to the Clutha /Mata-au River. The Clutha /Mata-au River is the dominant landscape feature in this area carving through the river terrace landscape but does not pass through the unit. The unit is characterised by low-lying stony flats with low vegetation and briar scrub. The flats are dissected into terraces with distinct escarpments emphasising the route of previous watercourses. The escarpments are quite steep in places, particularly where these front the Clutha /Mata-au River.

Patterns indicating minor watercourse erosion are evident from elevated locations but are less obvious on the ground.

To the north of this area conifer windbreaks are a significant feature. The windbreaks introduce unnatural patterns into the otherwise relatively flat, open landscape. However, when viewed from a distance, the scale of the valley results in the plantings providing little in the way of visual enclosure. To the NW of this unit is evidence of past mining activity and tailings.

This area has been identified as a RAP (Lindis RAP A14).

LU1b is very similar in character to LU1a, although the conifer planting is more dominant. Planting occurs along the boundaries of the unit and there is a block of plantation forestry within the unit. A significant feature within this unit is the pronounced scrub covered terrace that divides it in two.

LU1c is slightly different in character to LU1a and LU1b. Situated at the base of the valley faces, it comprises outwash flats rather than terraces. These flats have an improved agricultural character. Smaller paddocks in combination with valley faces give this area a slightly more enclosed character.

Visual & Scenic Values

LU1 is highly visible from the Luggate-Tarras Road which passes through the Clutha Flats. The flats are also visible from the Luggate-Cromwell Road (SH6) on the opposite side of the Clutha Valley. The flats and terraces contain significant visual and scenic values. These are derived from agricultural land use and from the setting within the spectacular montane landscape of the Upper Clutha Valley.

The terraces are expressive of formative landform processes, particularly from elevated viewpoints. The contrast between the river outwash terraces, fans, and faces is visually impressive. The river landscape, which includes the lower terrace and high escarpments, is highly scenic although natural values are comparatively low.

Table 1 Evaluation Summary

Criteria	Value	Comment
Intactness	Medium to High	Much of the original character transformed. Landscape pattern and processes fragmented
Legibility	High	
Aesthetic Factors	High Medium	Along river corridor Elsewhere
Historic Factors	Medium	None known
Visibility	High Medium	Upper terrace Lower terrace
Significance	Medium	Locally significant landscape
Vulnerability	Medium	Vulnerable to future development which could degrade the landscape within the river corridor

2.1.2 (LU2) Clutha Valley Faces

Description

LU2 comprises the western facing slopes within the Clutha Valley up to the western ridge of the Grand View Range. The unit is characterised by mainly colluvial slopes, smooth rounded ridges, and long, clearly defined gullies. A series of minor peaks define the top (and eastern) boundary of the landscape unit. A transmitter mast and associated buildings are situated on the central peak. As part of the Grand View Range the unit reads as a contiguous part of the eastern enclosure of the Upper Clutha Valley.

Vegetation on the faces has been strongly modified and a ground tier of exotic species is dominant. Scattered scrub, mainly native broom and matagouri, is present on lower slopes but is increasingly confined to the gullies at higher elevations. Grazing by sheep and rabbits has resulted in a significant reduction in vegetation and sunny faces are more denuded than shady faces. Pedestalling, which is indicative of soil erosion, is common in some areas where vegetation is particularly sparse. A small RAP (Lindis RAP A13) has been identified in the centre of LU2.

Recent track upgrade work has caused significant disturbance on the lower slopes of this unit. Previous earthworks in this area show signs of successful revegetation with little impact.

Visual & Scenic Values

This unit forms part of the eastern enclosure of the Upper Clutha Valley and the unit is highly visible over a large area of the surrounding landscape. Higher elevations provide spectacular views over the Upper Clutha Valley.

The Grandview Range as a whole is a significant and dominant landscape feature within the context of the valley, although there are no particular distinctive or outstanding features. Vegetation cover is highly modified, although scattered remnant patches of native shrubland are significant in terms of local character and identity.

Table 2 Evaluation Summary

Criteria	Value	Comment
Intactness	Low	Highly modified some patchy remnant shrubland
Legibility	Medium	
Aesthetic Factors	Low to medium	Not distinctive or memorable, typical range face landscape
Historic Factors		None known
Visibility	High	
Significance	Significant	Visual enclosure to Upper Clutha Valley, therefore important as part of the wider landscape
Vulnerability	Low	Existing remnants have survived grazing and fire

2.1.3 (LU3) Long Gully Valley

Description

This unit forms the eastern area of the lease. The unit is a distinct physical entity, comprising the upper catchment of Long Gully Valley. The valley is characterised by a steep V-shaped landform with colluvial slopes rippled by minor gullies and with occasional small rocky outcrops. Vegetation patterns are similar to the Clutha Valley faces with scattered patchy shrub mainly confined to gullies. A slightly higher native component, including short tussock, is present at higher elevations. Recent track upgrades, some along new alignments, are a significant feature within this unit. These draw the eye and conflict with the natural landform pattern.

Visual & Scenic Values

This unit comprises a relatively enclosed valley. Visibility of this unit is generally restricted to views from within the valley, although higher slopes and the tops are visible over a larger area of the Upper Clutha Valley.

The unit is a contiguous part of the southern end of the Grandview Range. While the steep landform creates a striking landscape, improved vegetation cover and recent track improvements have significantly degraded the natural values and natural character of the unit.

Table 3 Evaluation Summary

Criteria	Value	Comment
Intactness	Low	Highly modified some patchy remnant shrubland
Legibility	Medium	
Aesthetic Factors	Low to medium	Loss of natural character through modification of vegetation and tracks
Historic Factors		None known
Visibility	Low	
Significance	Medium	Part of the southern end of the Grandview Range and Upper Clutha Valley landscape
Vulnerability	Low	Ecological degradation has already occurred

Importance of the Landscape

Two areas on Long Gully Pastoral Lease have important inherent landscape values. These are the lower flats to the west of SH8A and part of the area east of SH8A and the Clutha faces of the Grandview Range.

The lower flats to the west and part of the area east of SH8A have high and dominant natural values. These are derived from the following characteristics and features:

- striking landform patterns formed by past river and watercourses processes
- open expansive views over the terraces encompassing the surrounding landscape
- impressive views into the Clutha /Mata-au River
- natural vegetation patterns

This area is vulnerable to change. The Clutha Valley floor landscape is changing rapidly due to existing and new land uses. Activities such as viticulture are altering the character of the open valley floor.

The second area of importance is primarily comprised of the Clutha Valley faces of the Grandview Range, but also includes part of the eastern area of the river flats to the east of the Luggate-Tarras Road. Generally these areas are more culturally modified but retain inherent landscape values important in terms of the wider Upper Clutha landscape. The Clutha faces are characterised by:

- high visibility and their important enclosing nature on the Upper Clutha Valley
- context and visual unity provided by the faces and flats with the surrounding landscape characteristics
- native vegetation patterns (although considerably depleted)

2.2 LANDFORMS AND GEOLOGY

In the Lindis Ecological District the dislocation of the mid-tertiary peneplain, responsible for Central Otago's large scale basin and range topography, is expressed on a smaller scale and in a different style from the standard pattern. The old erosion surface is warped into a set of north-east trending folds, with traces of the overlaying Manuherikia group sediments. The district merges into the main uplift area of the Southern Alps to the north-west.

The glaciers which excavated Lakes Wanaka and Hawea penetrated well down the Clutha Valley in the past, strongly influencing the landform of the western part of the Lindis Ecological District. Steepened valley wall and extensive moraines and outwash gravels, further modified by younger alluvial fans, are the most obvious. Except for the effects of this externally derived glacier, the mountains of the Lindis district have been essentially unglaciated and retain characteristically smooth, rounded ridges and summits. (Grove 1994)

Major topographical features visible on Long Gully PL include steeply dissected faces of the Grandview Range, lower fans, and recent alluvial flats. The hill portions of the PL consist of finely foliated schist of the Haast schist group. The broad terraced valleys largely comprise glacial outwash gravels and moraine deposits.

Importance of landforms

The river terraces provide a striking example of formative landform processes in the Upper Clutha area. Landform patterns have been created by past river and watercourse processes. The river terrace landform in combination with semi-arid climatic conditions, distinctive soils characteristics are closely connected to the floral and faunal character of the area. Recognising this, much of the terrace area on Long Gully PL has previously been recommended for protection as Lindis RAP 14.

SOILS

Soils in the Lindis ED are derived mainly from alluvial gravels, loess and Haast schist. The soils are generally light and prone to erosion. Windblown loessial deposits cover many of the foothill slopes.

Underlying soils patterns are dominated by an altitudinal and rainfall sequence. Brown-grey earths have formed in the driest zone (<500mm rainfall). Yellow grey earths occupy the lower mountain slopes and grade into high country yellow/brown earths above 700-1000m. This sequence reflects increasing leaching and acidity with decreasing fertility.

The valley floors are dominated by terrace gravels and include limited areas of recent soils on alluvium of flood plains and fans. Many have been intensively modified by agriculture and gold dredging. These soils may contain pockets of soluble salts, an ecologically important characteristic of the Central Otago basins. These are now much reduced in number and extent many being modified by agricultural development.

Importance of soils

Two soil types on the Long Gully PL have been identified as significant.

The Molyneux sandy loams and stony sands, found c.260m are significant. These are not a widely distributed soil type, being found at very low altitude on only a few Clutha /Mata-au River terraces (NZ Soil Bureau 1967). In their undisturbed form, they are best represented at Long Gully Terraces where they are extensive. These soils are a key feature of the Lindis RAP 14 (Grove, 1995).

Significant stony tallus areas are also associated with scarps at the site. In keeping with the Central Otago climate, these soils are seasonally water short. In some areas of the terraces the soils have evolved in association with open grassland/herbfield and open shrubland with lichens, rather than with tall woody vegetation.

2.3 LAND ENVIRONMENTS OF NEW ZEALAND (LENZ)

The environmental distinctiveness of this area has been assessed through the land Environments of New Zealand (LENZ). This is a classification of New Zealand landscapes using a comprehensive set of climate, landform and soil variables chosen

for their roles in driving geographic variation in biological patterns (Leathwick et al 2003). It is presented at four levels of detail containing 20, 100, 200 or 500 environments nationally. Land within this PL falls predominantly within Environment Q2.2a with smaller contributions of N4.1d, N8.1b, N5.1c and N4.1e respectively.

Nationally only 2.4% of environment Q2.2a s is protected for conservation purposes, 1.9% of Environment N4.1e, 1.6% of Environment N4.1d, 0.7% of Environment N8.1b and 0.8% of Environment N5.1c are protected for conservation purposes. This is well below the 20% suggested for the protection of native biodiversity.

2.4 CLIMATE

The Long Gully PL experiences hot dry summers and cold frosty winters. Average rainfall at the homestead is c 450mm rising to 760mm at the tops. There is a slight tendency to early summer concentration with late summer and winters being dry. There is a soil moisture deficit for much of the summer especially on sunny aspects. Snow only lies for more than a few days on shady faces at higher altitude. Prevailing winds are from the north-west and south-west and can be severe.

2.5 VEGETATION

All major vegetation communities on the PL were inspected and assessed as part of this tenure review inspection, although the survey concentrated on the more natural and intact areas. Good coverage of the property was facilitated by the extensive track system on the property.

Two land units are identified for the purpose of describing the vegetation. These are the Clutha Terraces and the hill country.

2.5.1 Clutha /Mata-au River Terraces

This land unit comprises the Clutha /Mata-au River terraces and contains two major terraces. A third, lower terrace alongside the river is outside the property boundary. While the terraces are primarily clad in native vegetation and are mainly uncultivated, some parts have been cultivated and some is covered in exotic pine species.

The terraces are poorly vegetated containing depleted, dryland vegetation and much bare ground. Some minor variation in vegetation occurs, dependent upon soil and micro topography. The major native species found were *Leucopogon fraseri* var. *muscosus*, *Raoulia australis*, *R. beauverdii* and *R. parkii*. Fescue tussock (*Festuca novae-zelandiae*), *Pimelea pulvinaris*, *Muehlenbeckia axillaris* and *Vittadinia australis* are locally common. *Colobanthus brevisepalus*, *Carex breviculmis*, *Luzula ulophylla*, *Poa maniototo* and matagouri (*Discaria toumatou*) are widespread in small amounts. Several exotic species were common.

2.5.2 Hill Country

The Hill Country land unit comprises the majority of the property. The general vegetation pattern consists of:

- grassed flats (which have been cultivated);
- lower slopes comprising pasture with some scattered shrubs (mainly briar and matagouri);
- mid slopes which contain depleted fescue tussockland on shady faces and pasture or depleted, dryland *Raoulia* cushionfield on sunny faces, with some areas of shrubland;
- upper slopes above 800-900m which retain snow tussockland.
- gullies which often have some rock outcropping and a variety of shrublands.

A feature of the property is the diversity of shrublands, which include grey scrub, kanuka shrubland and native broom shrubland.

Head of Long Gully Creek

Snow tussockland This was examined along the track below Trig O No. 2. There is moderate cover of narrow-leaved snow tussock (*Chionochloa rigida*, 10-20% cover, average 15%), with much bare ground/rock (15%), golden spaniard (*Aciphylla aurea*, up to 10% cover on sunny faces) and blue tussock (*Poa colensoi*, 8%). Also present are fescue tussock, *Raoulia subsericea*, *Leucopogon fraseri*, and many other native and pasture species. This community contains scattered coral broom (*Carmichaelia crassicaule*) and prostrate broom (*C. vexillata*). At lower altitudes the snow tussock thins out and fescue tussock and pasture species become more prominent.

Shrublands Grey scrub type shrubland extends up Long Gully Creek and beyond the main branch. This shrubland is dominated by matagouri and mingimingi (*Coprosma propinqua*), with some kanuka (*Kunzea ericoides*). A feature of the shrubland is the almost complete absence of briar. Prominent outcrops along the stream add diversity and interest to the area. Kanuka shrubland is found on the steep faces below Trig 12432.

Clutha Faces

Snow tussockland Snow tussockland forms only a localised cap in these ***west*** facing tributaries above c. 900m. An area sampled at c. 900m[1] had a low density snow tussockland (5-15% cover, average 8%), with much blue tussock (8-20%) and fescue tussock (5-15%), bryophytes (15%) and leaf litter. Other species included *Raoulia subsericea*, *Leucopogon fraseri*, golden spaniard, *Anisotome flexuosa*, *Acaena caesiiglauca*, *Anaphalis bellidioides* and many other native species. This community also contained scattered coral broom and prostrate broom. The exotic species sweet vernal and tussock hawkweed were relatively common.

[1] Grid Ref. G40 234 991

High altitude fescue tussockland Fescue tussock is dominant below the snow tussockland. Generally the associated species of the high altitude fescue tussockland are similar to the adjacent snow tussockland. Tussockland sampled below the summit saddle at c. 880m[2] comprised fescue tussock (18%) with much *Rytidosperma pumilum*, *Coprosma petriei* and sweet vernal, some bare ground/rock, leaf litter, bryophyte, *Leucopogon fraseri*, native broom (*Carmichaelia petriei*), *Raoulia parkii*, *Pimelea oreophila* and other native species.

Much of the area of high altitude fescue tussockland is found on ripply, colluvial slopes. In this slump country, a small flush is found along the stream that contains *Carex secta*.

Low-mid altitude fescue tussockland Fescue tussock occurs from the valley floor to the summit ridge on the property extending from the higher altitudes described above to c. 300m. Generally the condition and native component of these fescue tussocklands increases with increasing altitude. The low altitude tussockland is much modified and retains only a limited amount of fescue within the exotic grass. Commonly associated native species include blue tussock, *Leucopogon fraseri*, *Raoulia* species, native broom and matagouri.

Shrub tussockland This community was found on steep rocky slopes c. 900m[3] and contains a rich, unusual and interesting mix of species. The community consists of fescue tussockland with a light shrub cover consisting of *Pimelea traversii* (1-5%), *Carmichaelia petriei*, mingimingi, matagouri, coral broom and porcupine shrub (*Melicytus* aff. *alpinus*). Other species include *Raoulia subsericea*, little hard fern (*Blechnum penna-marina*), *Acaena caesiiglauca*, *Anaphalioides bellidioides*, occasional narrow-leaved snow tussock golden spaniard and many other native species.

Rock outcrops This community includes the rock outcrop vegetation found within the shrub-tussockland described above. High altitude rock outcrops form a refuge site for *Hebe buchananii*, *H. pimelioides*, *Olearia cymbifolia*, *Coprosma ciliata*, *Myrsine nummularia* and *Leucopogon suaveolens*. Also present was much *Brachyglottis haastii*, *Stellaria gracilenta*, *Asplenium richardii* and other native species typically associated with this habitat.

Rubblefield A rubblefield formed a fire refuge site for a shrubland at c. 820m[4]. This shrubland is dominated by mingimingi and *Coprosma ciliata*, with occasional matagouri, *Coprosma cheesemanii*, porcupine shrub, *Carmichaelia petriei*, *Hebe rakaiensis* and *Pimelea traversii*. Golden spaniard, the fern *Hypolepis millefolium* and creeping shrub *Myrsine nummularia* were also found.

Kanuka shrubland Kanuka shrubland was found on mid altitude sunny faces, on colluvial slopes not associated with rock outcrop systems. Much of this shrubland appears young and the presence of young, outlying kanuka plants indicates the shrubland is expanding.

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[2] Grid Ref. G40 230 986
[3] Below Trig 12432 at Grid Ref. G40 235 979
[4] Grid Ref. G40 233 982

Broom Shrubland Native broom extends to above 900m altitude, but is most common and forms an open shrubland between 350-800m. These low density native broom shrublands are a notable feature of the property. The community was sampled at two sites. The first site was near the upper altitude of broom shrublands at c. 750m[5] and the community consisted of *Carmichaelia petriei* (4-10% cover, average 8% and up to 1.25m tall), over fescue tussock (8-18% cover, average 12%) and exotic grasses and herbs (mainly sweet vernal, *Trifolium arvense*, sheep's sorrel and *Acaena agnipila*).

The second site was at lower altitude and consisted of *Carmichaelia petriei* (3-10% cover, average 6% and up to 1.25m tall), over fescue tussock, blue tussock and much exotic grass and herbs.

Depleted, dryland *Raoulia* cushionfield *Raoulia* cushionfields were found on sunny faces, generally at low to mid altitude, but extending to c. 860m. The ground cover is mainly bare ground/rock/gravel, with much scabweed (*Raoulia australis*), *R. beauverdii*, and lichen on rock. Associated species include *Rytidosperma pumilum*, *Leucopogon fraseri*, blue tussock, fescue tussock, *Colobanthus brevisepalus*, *Raoulia parkii* and other species.

Grey scrub This grey scrub shrubland community was found mainly along streams at low to mid altitude, but extended up the slopes in some places. The community is composed mainly of mingimingi and matagouri, with some bracken, *Rubus schmidelioides* and a few other species.

Low altitude shrubland was sampled at the bottom of the northern gully[6]. The shady aspect contained mainly *Helichrysum aggregatum*, with some mingimingi, matagouri, porcupine shrub, *Rubus schmidelioides* and *Muehlenbeckia australis*. A key feature of this shrubland was rock outcropping and the presence of the rare *Carex inopinata*. The opposing sunny aspect shrubland was dominated by mingimingi, with some matagouri, *Coprosma crassifolia*, *Helichrysum lanceolatum*, porcupine shrub, *Muehlenbeckia australis* and *M. complexa*.

Toe slope fan These fans, found where the streams spew onto the terraces, are a distinctive landform and one that is poorly protected. The vegetation on the fans was generally exotic grasses with some native herbs and a scattering of native shrubs. The shrub cover increases at the top of the fan. A couple of young kowhai (*Sophora microphylla*) trees and *Urtica aspera* were associated with shrublands at the top of the fan on the sunny aspect.

2.5.3 Problem Plants

Briar, hieracium and broom were the problem plants of note. Wilding pines and broom were present on portions of the Long Gully Flats and briar was common from low to mid altitudes. *Hieracium pilosella* and *H. lepidulum* were present throughout the tussockland and elderberry was present in some shrubland areas.

[5] Grid Ref. G40 232 983
[6] Grid Ref. G40 217 983

2.5.4 Importance of Vegetation

A flora of 107 species was recorded during the survey. This flora is not complete but indicates the overall flora, while not highly diverse, is highly typical of the Lindis ED. Several species were recorded which are threatened or have a restricted distribution.

Table1 Species recorded which are threatened or have restricted distribution.

Plant Species	Threat of extinction classification (Hitchmough, 2002)	Details
Carex inopinata	Nationally Endangered	Rock outcrop – occasional
Acaena buchananii	Gradual Decline	Tussockland - occasional
Carmichaelia crassicaule	Gradual Decline	Tussockland - occasional
Carmichaelia vexillata	Gradual Decline	Tussockland - occasional
Hebe pimelioides var. *rupestris*	Gradual Decline	Rock Outcrop – occasional
Raoulia parkii	Gradual Decline	Cushionfield and sunny depleted slopes and lower terraces – common (high alt fesc tssk)
Clematis marata	Sparse	
Raoulia beauverdii	Sparse	Cushionfield and sunny depleted slopes and lower terraces – frequent
Urtica aspera	Sparse	Shrubland (toe slope fan)– occasional
Hebe buchananii	Range Restricted	Rock outcrop – occasional
Colobanthus brevisepalus	Data Deficient	Cushionfield and sunny depleted slopes, Lower terraces – common
Vittadinia australis	Data Deficient	Cushionfield and sunny depleted slopes, Lower terraces – occasional

A number of locally uncommon species were also found (Table 2)

Hebe rakaiensis		Rubblefield – occasional
Olearia cymbifolia		Rock outcrop – occasional
Oreomyrrhis rigida		Cushionfield and sunny depleted slopes – occasional
Pimelea pulvinaris		Lower Terraces – common
Sophora microphylla		Shrubland – occasional

Clutha Terraces

The presence of the largely uncultivated terraces adjacent to the Luggate-Tarras Road and the Clutha /Mata-au River is very important. This area was identified in the Lindis-Pisa-Dunstan PNAP survey as RAP Lindis A14.

The PNA report states

> *"the distinctive shallow, stony and sandy soils combined with the representative insect fauna and vegetation make this RAP of considerable importance as the best example of a relatively natural Upper Clutha land system semi-arid terrace flats."*

The flora is not species rich, however it is distinctive and highly characteristic of the semi-arid terraces of the Upper Clutha Valley. A special feature is the presence of one of the more dense and extensive populations of both the prostrate hairy shrub *Pimelea pulvinaris* and low creeping shrub *Leucopogon fraseri* var. *muscosus*.

Recent expansions in viticulture, and the irrigation of terrace lands along the Clutha Valley mean few uncultivated sites remain. The large scale and size of this dryland valley terrace system is very important and greatly adds to its value and viability. The significance of this site is, therefore, far beyond what may at first appearance seem to be a depleted expanse of modified vegetation.

Hill Country

The meeting of tussockland and shrubland, together with the valley floor to hilltop altitudinal sequence this provides, is a feature of the upper portion of Long Gully Creek and the larger eastern aspect catchments. This continuity between shrubland and tussockland retains natural character now uncommon in the Grandview land system. The diversity of landform, aspect and the altitudinal range in the area combine to provide habitat for a rich diversity of low-mid altitude communities that retain high natural character. These communities include: grey shrub in the gullies; kanuka shrubland on slopes; extensive native broom shrubland; depleted, dryland cushionfields on sunny aspects; and fescue tussockland.

Snow tussocklands are highly representative of higher altitudes of the Grandview Range land system. They have become, however, largely fragmented and modified and very little is protected. The snow tussocklands on the Long Gully PL represent the best snow tussockland remaining in the lower southern portion of the Grandview land system. The snow tussockland present retains only a moderate density of snow tussock, but it is relatively extensive (100+ha). Fescue tussocklands are also important to this sequence as they form the fabric of the linkages between the shrublands and the snow tussockland. On Long Gully PL fescue tussocklands occur over a wide altitude range, and on a range of aspects and landform.

The property retains diverse shrubland communities. Native broom shrublands are a special feature both of this property and of the southern portion of the Grandview Range land system. The Lindis-Pisa-Dunstan PNAP survey identified Lindis RAP A13 as the best example of this broom shrubland type. This report states:

> *"this small RAP contains a good range of communities representative of lower altitude colluvial slopes, here in more natural condition than elsewhere at equivalent altitude, and with an unusually high diversity of native species."*

A second shrubland type extending along the streams and onto adjacent slopes is "grey scrub". A special feature of the "grey scrub" is the presence of a population of the nationally endangered sedge *Carex inopinata*, within an area locally dominated by *Helichrysum lanceolatum*. The presence of *Carex inopinata* is of national importance as only 6 sites for this species are known. This species is subject to a recovery plan (in press) which promotes the protection of its habitat.

The third major shrubland type present is the kanuka shrubland, associated with both rock outcropping and colluvial slopes. In addition, on a rubbly slope there is a localised, uncommon and unusual, low statured, shrub-tussockland containing much *Pimelea traversii.*

The current composition and distribution of shrublands both on this property and elsewhere in Central Otago is the result of a long history of burning and human modification. The shrublands found on this property show remarkable resilience and diversity. Despite past modification these shrublands retain some species which are either locally, regionally or nationally threatened or uncommon.

The importance of shrubland remnants has recently risen to prominence through the work of Walker et. al. (2002). These authors advocate more shrubland at low elevations should be reserved for the restoration of native woody vegetation and associated fauna. Future recovery and restoration of the woody vegetation on the property and the wider region is dependent upon the retention of as wide a range of shrublands as possible.

2.6 FAUNA

2.6.1 Invertebrate Fauna

Invertebrates were hand collected by day and collected at night by ultraviolet light during tenure review inspections on 7 -8th December 2002 and 1 -2nd April 2003. Weather conditions were mild with little wind and some warm periods. An inventory of 59 species of invertebrates was made, including 37 moths, which characterise a broad range of habitats. Some of these habitats are nationally important. Some invertebrates endemic to Central Otago or to the eastern South Island rain shadow were also found.

Inverterbrate habitat on the lease is semi-arid and the fauna must commonly cope with water deficit, wind, cold winters and dry hot summers. This is characteristic of the Lindis Ecological District. An extensive inter-montane series of outwash terrace and fan soils (c.240 -280 m) are inhabited by insects and spiders representative of the Central Otago Ecological Region. Some are best known from a few terraces in the region or the McKenzie Basin. In the adjoining hill slopes, streams and summit slopes (up to 1178 m) the fauna is characteristic of dry schist terrane with depleted native vegetation elements. There is a long historical association between a fauna of open non-forest vegetation and these slopes.

Clutha Terraces

The fauna on the terraces adjacent to the Luggate –Tarras highway, is representative of arid Central Otago flats. Such flats, once widespread, are now much reduced in extent and are often isolated by irrigation and cultivation. The *terraces on this PL are largely uncultivated and some original herbs and grasses remain.*The wasps *Podagritus albipes* and *P. cora,* and native bees *Leiproctus* spp were found in sandy patches. The spider hunting wasp *Priocnemis monachus*, which hunts tunnelweb spiders such as the pan tunnelweb *Hexathele petriei,* was also found. The range restricted sand scarab *Pericoptis frontalis* which has a threat of extinction status – range restricted (Hitchmough 2002), was found at the foot of the terraces. The scarab is known from few other Central Otago localities. A range of day active insects were associated with sparse vegetation. The tiny bug *Nysius huttoni,* moth *Kiwaia lithodes* (*Raoulia*), and moth *Arctesthes catapyrrha* live on mats. Dryland herb vegetation is inhabited by the moth *Euxoa admirationis,* plume moth *Pterophorus innotatalis* (larvae eat *Dichondra*), grasshopper *Phaulacridium otagoense* and black cicada *Maoricicada campbelli.* The locally abundant cushion daphne *Pimelea pulvinaris* and the locally common herb *Vittadinia australis* are likely hosts to fast day flying moths *Notoreas* nsp. and *Australothis volatilis* respectively.

Sparse shrub cover on the terraces and scarps hosts insects such as the copper butterfly *Antipodalycaena* new species (larvae eat *Muehlenbeckia australis*), moth *Athrips zophochalca* (larvae bore *Carmichaelia petriei*) and moth *Hieroderis* new species (larvae eat litter in dry shrubland). Other insects of kanuka, matagouri and dry shrubs are also indicative of the natural character of the terrace ecosystems.

West facing slopes up to 850 m

The contrasting eroded sunny spurs and shady aspects add to the complexity of insect habitats noted. These include permanent and intermittent streams, bluffs, bare soils/mats, short tussock, complex shrubland (native broom widespread), rocky colluvium/road cuts and tall kanuka shrubland.

The invertebrates present are highly representative of the ecological district. Many insects associated with eroded and open disturbed slopes are natural colonisers of disturbed sites and have intrinsic value even though much disturbance is a result of early pastoralism rather than natural processes. Some representative insects include large cicada *Amphipsalta strepitans* (in open tall shrublands), moth *Uresiphita maorialis* (larvae on *Sophora microphylla* c.340 m), moth *Orocrambus cyclopicus* (larvae in native grasses) and moth *O. lewisi* (larvae in *Poa cita*). Represented in open areas of short herbs were two grasshoppers, *Sigaus australis* and *Phaulacridium otagoense*, the moth *Leptomeris rubraria* (larvae eat Plantago) and the moth *Paranotoreas brephosata* (Larvae eat willowherbs). Red Admiral butterfly *Bassaris gonerilla* is likely to have larvae on rare nettle *Urtica aspera* found under shrubs along stream channels and at the head of a toe slope fan.

Long Gully head and adjacent ridges

The insect associations in low-alpine environment and vegetation above 850 mostly extend across range tops beyond central Otago. However, a few insects, such as the diurnal moth *Notoreas paradelpha,* are more localised in occurrence and are indicative of quality habitat at this altitude. Invertebrate life of interest in this area included larvae of the pink noctuid moth *Meterana meyricci* feeding on buds of low shrubs of *Pimelea traversii* and a local population of native tiger moth *Metacrias huttoni*. Tiger moth can be locally very abundant in some years, but its distribution is limited by larval dispersal (woolly bears) in grassland as the adult females are flightless. The blue butterfly *Zizina oxleyi* is significant on these ridges as its larvae are hosted on the locally abundant prostrate – cushion broom *Carmichaelia vexillata*. Elsewhere, blue butterflies are now hosted on exotic prostrate legumes such as clover because native prostrate brooms have declined.

Importance of the invertebrate

The mosaic of low growing communities on the extensive flats cut by the Luggate-Tarras Road and bound by the Clutha /Mata-au River is nationally important for indigenous invertebrates. A spider and many insects present are endemic to open ecosystems characterised by semi-arid stony and sandy soils. They live in association with plant mats, cushions, sparse herbfield/bare soils and diminutive grasses, mosses, lichens and herbs. As a valley floor ecosystem retaining much natural character, these flats are rare in any New Zealand setting, not just in Central Otago. It is most likely that some of the plant and insect associations on the flats began at the end of the last episodes of sediment outwash during the quaternary glaciation. While woody vegetation has been severely depleted, a range of representative insects continue to be associated with the remaining lowland shrubland remnants.

Clutha Faces

Given the semi-arid climate and fire prone nature of the Lindis Ecological District several habitat types in this area are significant. Communities with permanent water and native (riparian) vegetation are regionally significant. Low altitude shrublands associated with fan soils, bluffs, talus, riparian and shaded or sunny slopes on the slopes above Luggate-Tarras Road (below 600 m), form an important habitat complex for the Ecological Region. The fauna of native grassland, mat plants and herbfield will have expanded on these slopes. While disturbance in this area is generally not the result of natural process, many insects are natural colonists of disturbed sites and in association with other communities here are regionally representative and important.

At higher altitudes above the highway and in the head of Long Gully, grassland communities are typical of the region but have some significant associations. These include a good range of low-alpine shrubs and herbs signalling invertebrate diversity and significant inherent value of ecosystems. Of note is the abundant cushion/prostrate broom *C. vexillata* as a natural host for blue butterfly.

Insects ranked as threatened with extinction (Hitchmough, 2002) present on the PL include the threatened sand scarab *Pericoptis frontalis* which is classified as Range Restricted. This beetle is found in a few sandy terrace soil sites in the region, for example, the Cromwell Chafer Nature Reserve.

2.6.2 Herpetofauna

Weather conditions ranged from marginal to excellent during the lizard survey. Common skinks Oligosoma spp were present on the terraces below the Luggate-Tarras Road. No lizards or skinks of conservation importance were found on this property.

2.6.3 Avifauna

Birds recorded during the tenure review inspection included pipits, harriers and plovers. No birds of conservation importance were recorded.

2.6.4 Aquatic Fauna

During this survey several creeks were surveyed using a backpack electric fishing machine using defined criteria (Allibone, in prep.). No fish were found during the tenure review inspection. No previous freshwater fish records for Long Gully PL were found on the National Institute of Water and Atmospheric Research Freshwater Fish Database.

2.6.5 Problem Animals

This property has previously been subject to a Rabbit and Land Management Plan. Rabbits are likely to continue to be a significant pest requiring control.

2.7 HISTORIC

A set of stone sheep yards on Long Gully PL[7] are said to date to the original Morven Hills period. These are derelict and have been robbed of stone to build garden walls at the homestead. Several small areas of tailings are evident in the area of the marginal strip along the Clutha on Long Gully. None of these sites is of sufficient significance to merit special protection beyond that which exists under the provisions of the Historic Places Act.

[7] NZ Archeological Association site no. G40/33,

2.8 PUBLIC RECREATION

2.8.1 Physical Characteristics

The Lindis Ecological Region provides varied hill and mountain terrain, ranging from mountain glaciers and forests to gentle tussock hills. Long Gully which lies toward the southern end of the Grandview Range provides generally easy/moderate hill country with associated walking, bike riding and horse riding opportunities. Tracks on the property link into a wider network of tracks, which provide almost continuous access along the tops of the Grandview Range from the Lindis River to Lake Hawea.

The Long Gully PL also lies adjacent to the Clutha/mata-au River. Access to rivers in semi-arid areas such as the Upper Clutha Valley is limited. River access provides for a range of active pursuits such as fishing and kayaking and more passive pursuits such as picnicking.

The Recreation Opportunity Spectrum (1992) compiled by DOC for the Otago Conservancy mapped this area, regardless of land tenure, according to setting, activity and recreational experience characteristics. Deep Creek lies in an area zoned *Rural,* which *...is characterised by a feeling of being away from urban areas, but in a strongly human-modified setting...* which *...encompasses most of the more developed and accessible farmland..*

The Recreation Opportunity Spectrum (1992) compiled by DOC for the Otago Conservancy mapped Otago, regardless of land tenure, according to setting, activity and recreational experience characteristics. Long Gully lies in an area zoned *Rural,* which *...is characterised by a feeling of being away from urban areas, but in a strongly human-modified setting...* And which... *encompasses most of the more developed and accessible farmland.* Areas within the rural zone are identified as being generally utilised for trips of short duration. Long Gully offers opportunities for both day length trips and access to one and multi day trips on the Grandview Range and in the Lindis area.

Similarly, the Federated Mountain Clubs publication "Outdoor recreation in Otago – A Recreation Plan" (Mason 1989) includes Long Gully and the surrounding area (below 1000m) in an "open space" zone. In this document the primary recreational management requirements for "open space" are *...provision of public access ways and the maintenance of tussock-grassland and native forest settings requiring controls of forestry establishment and prevention of wilding tree spread.*

2.8.2 Legal Access

- The formed legal Luggate –Tarras Road SH8a cuts across river terraces in the lower area of the PL. A parallel unformed road also dissects the terraces but provides no practical access.
- An unsealed easement provides access to the VHF masts at highpoint 816, but this is not a legal public access.

2.8.3 Activities

The easy/moderate hill terrain, well formed farm tracks and links within the Long Gully PL to routes which traverse the Grandview range, provide a range of potential walking, horse riding and mountain biking opportunities. 4WD access may be possible with permission. Opportunities include, for example:

- Walking, mountain biking and horse riding trips on tracks through the property which connect to tracks on the Lake Hawea - Grandview- Bluenose -Trig Hill - Trig O - Lindis Peak ridge system and access to that system at a convenient mid-point
- Access up a formed road to VHF masts and beyond on formed farm tracks toward O No.2
- Riverside opportunities for day walks and passive pursuits
- 4WD access with permission

PART 3 OTHER RELEVANT MATTERS & PLANS

3.1 CONSULTATION

Long Gully PL was discussed at an NGO early warning meeting held in Alexandra on 22nd May 2003. Some NGO representatives have also inspected the property. The main points raised during the meeting and in subsequent submissions were:

PANZ

- Long Gully provides a key access point for a route to Mt Grandview

Forest and Bird

Forest and Bird made a written submission. A full copy is attached as Appendix Two. The key findings and recommendations (abbreviated) of that submission are:

- Landscape is a significant inherent value on this property.
- Two small but significant RAP's lie on Long Gully PL. RAP 13. These should be returned to Crown control and fenced to protect the shrubland from grazing and accidental top dressing. Lindis RAP A14 should be protected from the trend to lifestyle/grape blocks which would destroy any inherent values in this land.
- Walking access must be provided from Long Gully up the present route to the VHF repeater and beyond through Sandypoint and Glenfoyle to Lake Hawea, all of which are presently under Tenure Review. Access through adjacent freehold property can be negotiated later.

FMC

- This is an area of geologic transition between the high relief main ranges and the gentler block mountains to the South East and between the strongly foliated Central Otago Schists and Canterbury greywacke. South of the Timaru River the country drops to rounded crests at 1,600m on the Grandview Range. This easier topography is in marked contrast to the contorted forms of the north (Mason, 1989).
- Public use of, and access to, the tracks around Lake Hawea – Grandview-Bluenose –Trig Hill- Trig O – Lindis Peak ridge system is the main issue of this tenure review.

- A good access road leads from Long Gully to a collection of translator masts on a prominent spur overlooking the upper Clutha valley. Beyond the translators the track climbs to about 1200m where it crosses into Sandy Point Pastoral lease, just below Trig O.

- Recreational significance of this property lies in its position at the corner of ridge systems extending northwards to Grandview and eastwards to Lindis Peak.

- PL provides access to an extensive track system which provides easy travel and excellent views of the surrounding area and is ideal for tramping, horse riding mountain biking and 4WD use with the runholders consent.

- Through trips to the Lindis area are a longer term possibility as tenure review process proceeds.

- Recreational use of this area is almost entirely confined to the Hawea Flat approaches to the Grandview Range and Timaru River. TR of this property provides an opportunity to extend use and access.

- Access to the central parts is important because the distances to the extremities are considerable and access to central part opens up a greater number of alternatives trips for day or overnight travel.

3.2 REGIONAL POLICY STATEMENTS & PLANS

(a) Regional Policy Statement. The Regional Policy Statement for Otago provides a policy framework for all of Otago's significant regional resource management issues. It does not contain rules. District Plans shall not be inconsistent with the Regional Policy Statement.

In respect of natural values the Regional Policy Statement includes the following policy and method:

Policy: "To maintain and where practicable enhance the diversity of Otago's significant vegetation and significant habitats of indigenous fauna, trout and salmon..."

> *Method: "Identify and protect Otago's significant indigenous vegetation and significant indigenous habitat of indigenous fauna, trout and salmon, in consultation with relevant agencies and with Otago's communities".*

In respect of landscapes and natural features it includes the following policy and method:

Policy: "To recognise and provide for the protection of Otago's outstanding natural features and landscapes."

Method:" Prepare in conjunction with relevant agencies and in consultation with the community and affected landowners, an inventory of outstanding features and landscapes that are regionally significant.

3.3 DISTRICT PLAN

Deep Creek PL is located within the Rural Resource zone of the Central Otago District Plan. In general, the proposed Central Otago District Plan (amended to incorporate Council decisions) does not act as a trigger for the protection of tussock grasslands and smaller wetlands and forest areas. Resource consent is required for excavations or tree planting within specified distances of a water race or irrigation pipeline, and for development work within 10m of any water body.

There are no registered historic sites, or areas of significant indigenous vegetation and habitats of significant indigenous fauna and wetlands as set out in the schedules of the plan. Protection is limited to the controls set out above.

The Property contains the Long Gully Microwave Station (R206) which is designated for the purposes of "Telecommunications and Radiocommunications and Ancillary Purposes" and is listed in schedule 19.2.

3.4 CONSERVATION MANAGEMENT STRATEGY & PLANS

The Otago Conservancy of DOC has prepared a Conservation Management Strategy (CMS) which was approved by the New Zealand Conservation Authority in August 1998.

Deep Creek PL lies in the proximity of the Hawea-Lindis Special Place. The CMS objectives for the Hawea-Lindis Special Place relevant to Deep Creek are:

- *To manage and enhance recreational opportunities on lands administered by the department in the Hunter-Hawea area to maintain natural and historic resources of areas while providing for an appropriate range of recreational activity of high quality.*

- *To achieve permanent protection for areas of significant nature conservation importance in the area*

The key implementation methods relevant to Long Gully are:

- *Negotiation opportunities presented by pastoral lease tenure review or land exchanges on the large pastoral runs in the area will be taken with a view to:*

    - *Protecting areas of significant nature conservation value*
    - *Improving public access and recreational opportunities*
    - *Protecting landscape qualities*

Priorities for the Hawea-Lindis Special Place are:

Consolidation of protected areas and protection of key habitats through Tenure Review negotiations and improving public access and animal and plant pest control activities.

3.5 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 which is a blueprint for managing the country's diversity of species and habitats and sets a number of goals to achieve this aim. Of particular relevance to tenure review, is goal three 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 ecosystems 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.*

The strategy outlines action plans to achieve this goal covering terrestrial and freshwater habitat and ecosystem protection, sympathetic management, pest management, terrestrial and freshwater habitat restoration, threatened terrestrial and freshwater species management, etc.

PART 4 MAPS ETC.

4.1 REFERENCES

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4.2 ILLUSTRATIVE MAPS

Map One	Long Gully topographic and cadastral boundaries
Map Two	Long Gully values and key recreation routes plan
Map Three	Landscape units and important landscape values.