

Crown Pastoral Land Tenure Review

Lease name : Merivale
Lease number : PO 193

Lease name : Long Acre
Lease number : PO 188

Lease name : Geordie Hills
Lease number : PO 053

Lease name : Shirlmar
Lease number : PO 192

Lease name : Nine Mile
Lease number : PO 365

Lease name : Timburn Station
Lease number : PO 237

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.

Copied October 2002

CONSERVATION RESOURCES REPORT

FOR THE COMMISSIONER OF CROWN LANDS

**SHIRLMAR, TIMBURN, GEORDIE HILLS,
MERIVALE, LONGACRE AND NINE MILE
PASTORAL LEASES**

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PART 1: INTRODUCTION

The lessees of adjoining Shirimar, Geordie Hills, Longacre, Merivale, Timburn and Nine Mile pastoral leases have jointly applied to the Commissioner of Crown Lands for a review of their pastoral lease tenure. For this reason a conservation resources report has been compiled for the cumulative area of the properties rather than on an individual basis.

Nine Mile is located on the western side of State Highway 8 on the eastern flanks of Lindis Peak. The remaining five properties are located on the eastern side of State Highway 8. Together the six pastoral leases incorporate an area of approximately 18,992 ha (Geordie Hills 2097 ha, Merivale 2667 ha, Shirimar 3521 ha, Timburn 5131 ha Longacre 3341 ha Nine Mile 2235 ha). With the exception of Nine Mile, these properties occupy a large area between State Highway 8 and Dunstan Creek under the western flanks of the St Bathans Range. The Chain Hills (which link the Dunstan Mountains to the south, with the Dunstan Range to the North) bisect these properties, creating a considerable physical barrier between flats and relatively low hills in the west and the Dunstan Creek Valley floor in the east. The extent of the area and pastoral lease boundaries is depicted on Map 1 (appendix).

A small (8094 m²) freehold area is (site of the old Lindis Hotel) is farmed in conjunction with the Nine Mile pastoral lease.

The group of properties are situated in the Lindis Ecological District and form part of the Chain, Georges and Breast Land Systems. A Protected Natural Areas survey (PNA) of the Lindis, Pisa, and Dunstan Ecological Districts was carried out during the summer of 1984/5. A final report was published in November 1994. This report included no Recommended Areas for Protection (RAP's) on the six properties subject to this tenure review application. Criteria for protection under tenure review are different than those adopted under the PNA Programme. A variety of specialists from the Department of Conservation visited all properties in November 1996 as part of this tenure review exercise.

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PART 2: CONSERVATION RESOURCE DESCRIPTION AND ASSESSMENT OF SIGNIFICANCE

1. LANDSCAPE

Two landscape character types have been identified within the land area covering all six properties. The first is referred to as the Lindis - Tarras Hills landscape type and the second Dunstan Creek landscape type.

Landscape character is the description of the identifying sum of all elements and expressions that make up the landscape. These include landform, waterform, vegetation, land use and cultural features. Following the character description a qualitative evaluation of each landscape type is given. This is a judgement about the quality of a landscape using a set of criteria.

The following five attributes were used in the evaluation.

- Intactness: The condition of the native vegetation and the degree of modification.
- Coherence: How the landscape visually 'hangs together' - derives from characteristics including intactness, unity and compatibility. Intrusions, alterations, disruptions tend to distract from coherence.
- Distinctiveness: The special characteristics and qualities that make it stand out (or otherwise).
- Visibility: Determines how easily and regularly a landscape is seen.
- Significance: Significance of the characteristics and features. If they are locally, regionally or nationally significant.

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LANDSCAPE CHARACTER DESCRIPTION

Landscape character is in summary form as a detailed description of landform and vegetation is provided elsewhere in this report.

a. Lindis/ Tarras Hills Landscape Type

This type includes all the Lindis Peak flanks within the Nine Mile pastoral lease, and extends across approx. 90% of the remaining five properties to the top of the Chain Hills. Although there is variation within this large area in terms of landform type and vegetation cover, there is sufficient homogeneity to include it within one landscape type.

The characteristics of this landscape type include:

- a high degree of cultural modification through pastoralism
- alluvial flats and low terraces adjacent to the Lindis River. Areas of it are cultivated and irrigated, with an oasis like quality in stark contrast to the dry hills surrounding it.
 - A forest plantation forms a dominant pattern on the Shirlmar flats.
 - Plantings associated with homesteads and buildings are a feature. The willow lined Lindis River is also a dominant element.
- A ridge and gully system forming the flanks of Lindis Peak to the west.
- Broad undulating ridges of the Middle Hills between Lindis Flats and the Chain Hills. The ridges are incised by the rocky narrow gorges of the Timburn and Coal Creek.
 - Sunny faces are dry and barren with sparse short tussock, bare ground, patches of briar and exotic herbs and grasses.
 - Shady faces are mixed exotic/ native shrub land, short tussock and pasture grasses.

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- A small basin/ valley system enclosed by the Chain Hills to the east and Middle Hills to the west.
 - Landforms are smooth and rounded. The basin floor is a series of low terraces, hills and flats, shrubland patches (predominantly matagouri) and a short tussock/ pasture grass mixture. Low lying areas contain remnant wetlands.
 - Vegetation is highly modified though comparatively less degraded than the Middle Hills.
 - A high level of farm development has occurred. All appears to have been AOSTD with substantial sub division fencing, stockyards etc.

- The Chain Hills western faces are characteristically smooth Lindis Pass type landforms (colluvial slopes) with an absence of rock outcrops. Short tussock gives way to snow tussock with altitude.

- The Upper Timburn catchment on Shirlmar is the least modified within the Lindis/Tarras Hills landscape type. Tussock cover is relatively intact apart from lower parts of the valley floor. A dense shrubland dominated by *Olearia odorata* on the north face is a notable component.

Visual and Scenic Values

A dominant feature throughout this landscape type is the impressive and distinctive backdrop view of the St. Bathans Range which is never far from view.

The Lindis Peak flanks and the front country of Shirlmar, Merivale, Timburn, Geordie Hills and Longacre, form part of the Tarras/Lindis Pass visual corridor. The view from the highway of cultivated flats, dry, barren middle distant hills and backdrop views of the St Bathans Range is visually impressive (especially when snow capped).

The degree of land degradation evident over some of this landscape type in the form of barren depleted hills and eroded watercourses detracts to some extent from 'landscape value'.

A stone walled stock enclosure dating back to the early Morven Hills Station on the flats within Longacre pastoral lease is of historic and visual interest.

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Lindis/Tarras Hills Evaluation

	High	Mod-high	Moderate	Mod-low	Low
Intactness					
Coherence					
Distinctiveness					
Visibility					
Significance					

b. Dunstan Creek Landscape Type

The eastern flanks of the Chain Hills and small areas of flats and fans on the east side of Dunstan Creek on Shirimar, Timburn and Longacre pastoral leases fall within the Dunstan Creek Landscape Type. This highly distinctive landscape forms a neat topographic unit and geological transition from greywacke to schist. It represents a large scale remote back-country valley with impressive, varied and highly visible landforms clothed in continuous tussock from valley floor to high altitude. The valley floor is now depleted short tussock with a high *Hieracium* component. Visually it still appears more or less as a homogenous tussock grassland.

The eastern flanks of the Chain Hills forming part of this landscape type has been subject to A.O.S.T.D. and is more modified than other parts of the upper Dunstan Creek catchment. They are however an integral part of the valley system and landscape as a whole. The cultural overlay of pastoralism is an added dimension to 'landscape values' of Dunstan Creek.

Tributary catchments of Dunstan Creek are visually impressive viewed from Chain Hills ridge toward the St Bathans Range. Tussock and matagouri remain the dominant cover.

Dunstan Creek landscape type- Evaluation

	High	Mod-high	Moderate	Mod-low	Low
Intactness					
Coherence					
Distinctiveness					
Visibility					
Significance					

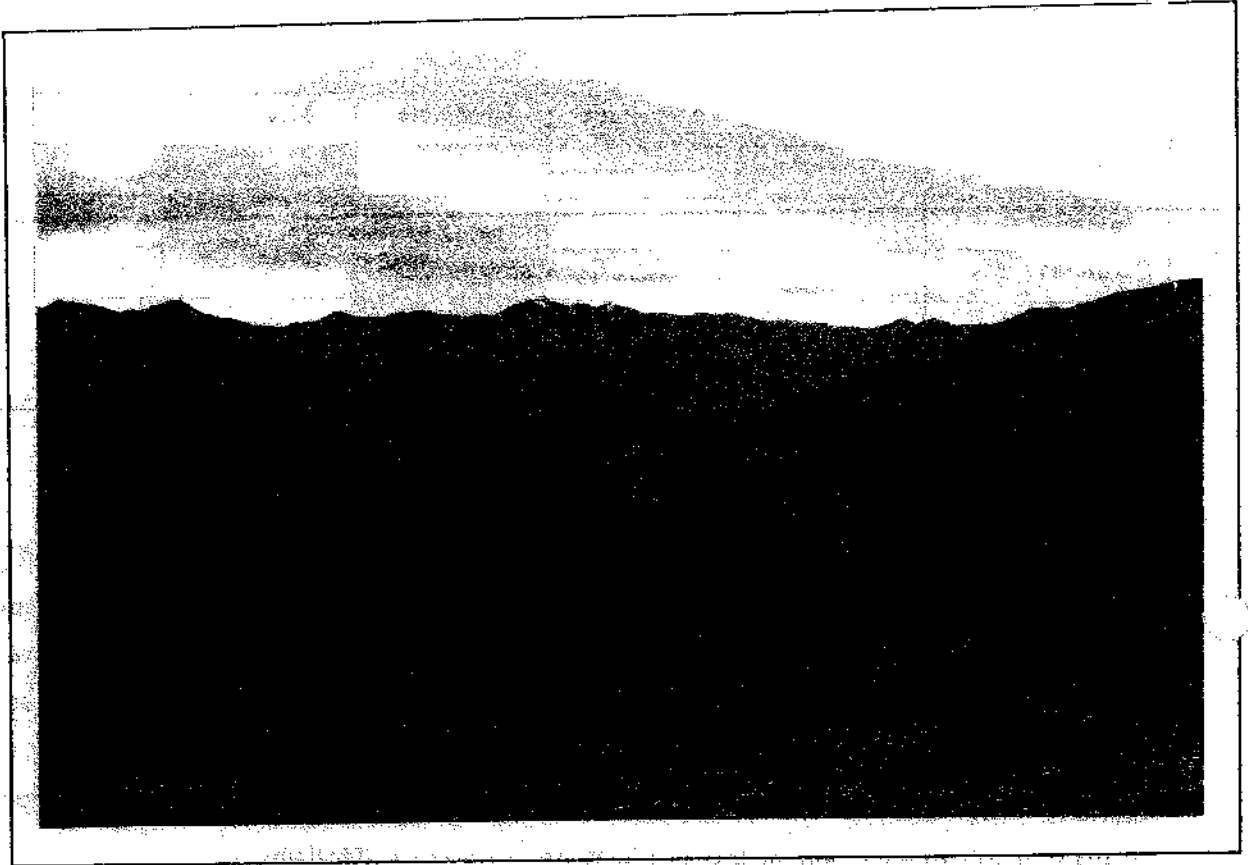


Photo 1. Dunstan Creek - an area of high landscape values

2. LANDFORMS AND GEOLOGY

2(a) Topography

Nine Mile pastoral lease lying on the western side of State Highway 8 occupies the northern, eastern and southern flanks of 1226 metre Lindis Peak. 80% of the property comprises moderately sloping hill faces. The balance comprises narrow steep sided rocky gorges and flat to rolling areas. Shirlmar, Geordie Hills, Merivale, Longacre and Timburn occupy an area between the Lindis River in the west and Dunstan Creek in the east. The topography of this area can be divided into six broad components:

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- (1) Low lying flats (largely cultivated and irrigated) adjacent to the Lindis River.
- (2) A series of predominantly east-west running ridges between the Lindis Valley flats and the western flanks of the Chain Hills. Small streams (many ephemeral) have incised numerous steep gorges into these ridges.
- (3) The mid reaches of Coal Creek, Tim Burn and Pleasant Valley are characterised by steep sided rocky gorges with a narrow section of flats on either side of these streams.
- (4) A series of flats and gentle fans lie at the western base of the Chain Hills and at the head the gorges described in (3). These are separated by a line of saddles linking the headwaters of all the west flowing Lindis tributaries.
- (5) The Chain Hills lie on the western side of these properties. This range, the crest of which lies between 900 and 1247 metres a.s.l forms a link between the considerably higher Dunstan Mountains to the south and Dunstan Range to the north.
- (6) Small areas of flats and fans on the east side of Dunstan Creek form the western periphery of Shirlmar, Timburn and Longacre.

2(b) Geology

The Chain Hills are "formed on a fault-bounded block of semi-schist, separated from the schist to the west by a fault system following the line of saddles linking the headwaters of all the east flowing Lindis tributaries, and separated from the Torlesse greywacke of the St Bathans Range in the east by a fault in Dunstan Creek at the ecological district boundary. The land form style is distinctive and matches the rock types in being intermediate between that of the Georges Land system to the west and the St Bathans district to the east. Smooth colluvial slopes and a moderate scale of dissection are characteristic, with minor localised slumping and minor talus" (Ward et al 1994). Country lying between the Lindis River and the Chain Hills comprises a large part of the Georges land system which "is characterised by survival of a close approximation to the tertiary peneplain, uplifted to form the warped plateau surface of Morvern Hills and the parallel broad troughs and ridges to the south. Although the Lindis River and some of its larger tributaries are deeply entrenched into the warped peneplain, much of the old erosion surface is dissected rather shallowly; slumped surfaces are less extensive than in Georges land system, smooth slopes and ridges are predominant with moderate areas of outcropping rock" (Ward et al 1994).

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Significance of Landform and Geology

Excluding Nine Mile, the entire area running from west to east represents a transition from a schist substrate in the Georges land system to the Torlesse greywacke of the St Bathans Range. The underlying geology has resulted in characteristically smooth slopes over much of the area.

Geomorphology

Although the flora and soils in Dunstan Creek are somewhat modified, the flood plain remains significant as it is unaltered by drainage or flood protection works. Fluvial processes in Dunstan Creek continue to function in a natural manner, with flooding and infiltration supplying water and nutrients to springs and wet areas.

2(c) Soils

Brown-grey earths (Alexandra steepland, Conroy Hill, Ardour terrace and Linnburn terrace soils) have formed in the driest zone where rainfall is generally less than 500mm per annum. Yellow-grey earths (Arrow steepland and Blackstone soils), occupy the lower mountain slopes, grading into high country brown earths (Dunstan steepland, Waenga Hill, Bourke terrace and Alpine Steepland Soils) above 700-1000 metres a.s.l. This sequence reflects increasing leaching and acidity with decreasing fertility.

A small area of bright white soils supporting little vegetation was observed on a toe slope immediately to the south of the lower reaches of Coal Creek (Grid Ref NZMS 260 G40 353 982). These soils are probably affiliated to Chapman soils which have developed on deeply weathered schist exposed after stripping of Tertiary sediments (McCraw J.D 1964). These soils are distinguished by their high salt content. No halophytic plants were noted inside the area. The site is similar to a registered site (SS 14CO, McIntosh et al 1990) near the lower Nine Mile Creek, however this site appears to be a larger exposure.

Significance of Soils

The saline soil site adjacent to Coal Creek is of some scientific significance. While there are no halophytic flora or fauna on the site, the soil type is relatively rare in the Lindis Ecological District with no protected examples.

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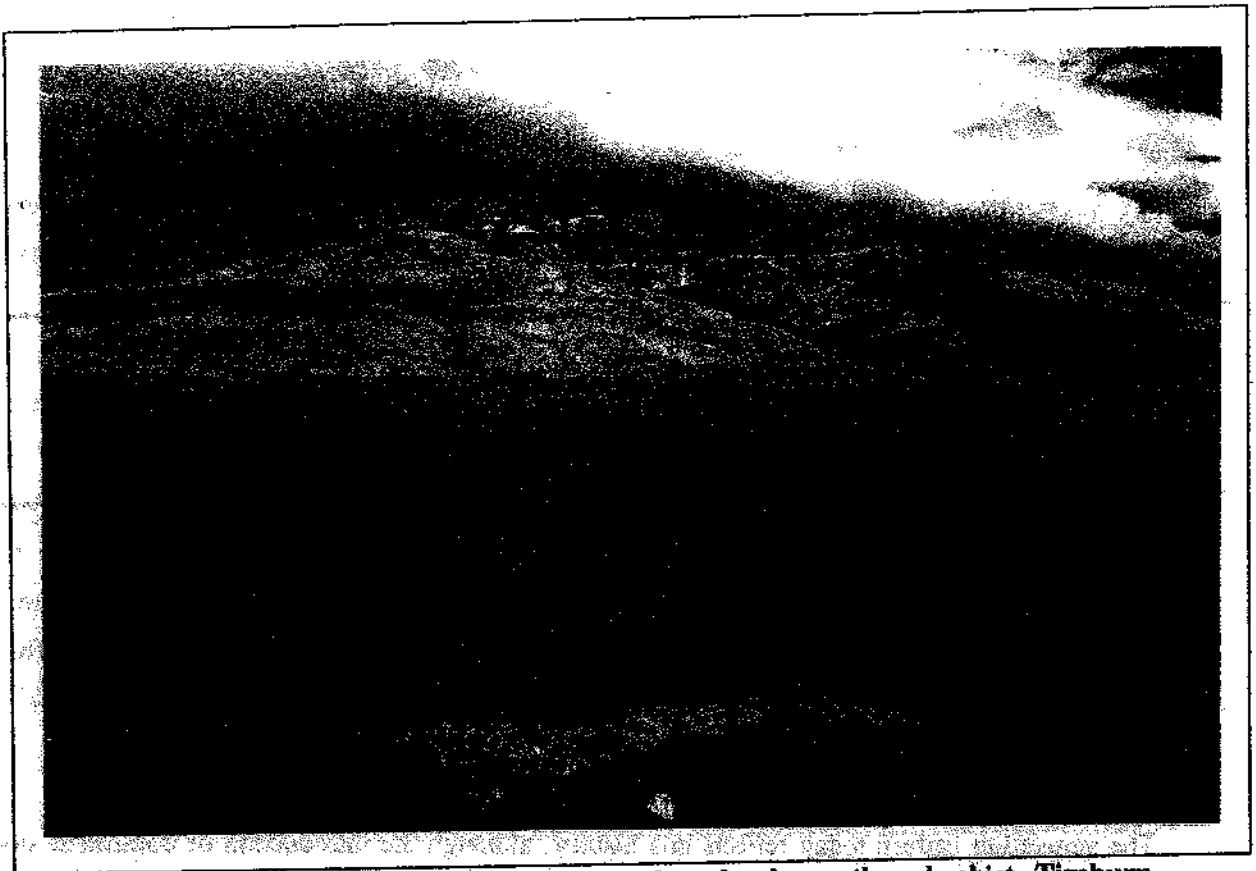


Photo 2. Soils affiliated to Chapman Soils developed on deeply weathered schist. Timburn Pastoral Lease

2(d) Erosion

Sheet erosion, by wind deflation and water has left many soil profiles reduced to stony sub soils.

3 CLIMATE

Climate is typical of the intermontane basins of Central Otago. The area occupies a rain shadow between major mountain ranges to the north, west and east. Average rainfall in the Lindis river valley is in the order of 500mm per annum and exceeds 1000mm on the crest of the Chain Hills (where a significant proportion falls as snow over winter months). Rainfall is higher over summer months than the rest of the year, largely due to convective storms formed by high ground temperatures during settled weather patterns. Winds are predominantly from the westerly quarter. Soil water deficits are severe in summer at low altitude and on sunny mid altitude aspects. Summers are warm and winters cold and frosty with periodic snow to the base of the property.

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4 VEGETATION

The vegetation of this portion of the Lindis Ecological District is characterised by a very high degree of modification. Evidence suggests that the arrival of Polynesians approximately 800 years ago "brought an increased incidence of fire which greatly accelerated the rate of vegetation change" (McGlone M.S 1983) which probably resulted in a decrease in woody vegetation and led to a great increase in the cover of *Chionochloa rigida* (narrow leaved snow tussock) on all but the driest low altitude faces and drought prone alluvial terraces of the valley floors, where native grasses including *Festuca novae-zelandiae* (hard tussock), *Poa cita* (silver tussock) and native grasses and scattered or locally dense shrub species were probably the dominant vegetation at the time of European settlement in the 1860's (Ward et al 1994). The advent of pastoralism was accompanied by frequent burning of tussock grasslands, maintenance of high stock numbers and falling soil fertility. *Chionochloa rigida* was largely eliminated. At lower altitudes depletion was greatly exacerbated by extreme rabbit numbers.

The vegetation pattern today reflects this history, although the introduction of controlled stocking, rabbit control, aerial oversowing, topdressing, irrigation and cultivation of flats has reduced the area of severely depleted lands. Only the highest parts of the Chain Hills and the deepest fire refugia support a flora which bears some resemblance to the era prior to pastoralism. Sunny, dry, low to mid altitude slopes whilst highly modified, support a rich diversity of native and introduced species.

A description of vegetation in each of the six topographic components described in section 2(a) is presented below. As Nine Mile is geographically separated from the other properties, a separate vegetation description is presented for this property.

(a) Low lying flats adjacent to the Lindis River.

These low lying areas predominantly comprise developed farmland much of which is cultivated and under irrigation. A substantial area on Merivale has been put into exotic forestry. Although the margins of the Lindis River and other tributaries from the east are heavily overgrown with willow trees, *Olearia lineata* shrubs also comprise a common component of riparian vegetation.

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Significance of Vegetation

This area is highly modified and the vegetation is considered to be of little conservation significance.

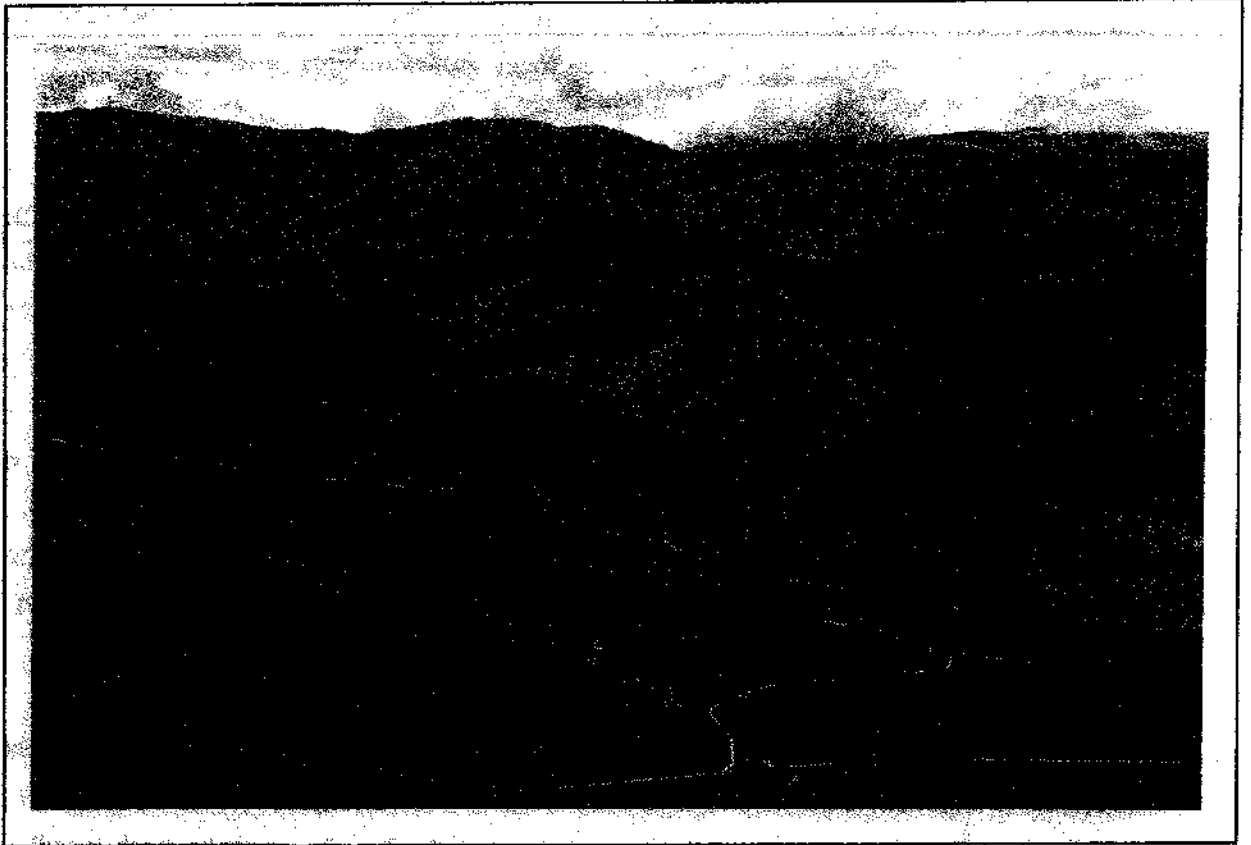


Photo 3. Low lying flats adjacent to Lindis River - Merivale and Longacre Pastoral Leases

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(b) Series of east-west running ridges between the Lindis Valley flats and the western flanks of the Chain Hills.

The flora of this topographical component is characterised by a strong contrast between shady and sunny aspects and moderate terrain versus deep rocky gullies.

Rosa rubiginosa (sweet briar) forms an extensive cover on a range of aspects including sunny north faces on Geordie Hills. Many areas support a 30-50% ground cover of this species. Dense briar areas typically support a secondary cover of *Discaria toumatou* (matagouri), *Olearia odorata* and a wide variety of introduced and native grasses and herbs. Native species include *Muehlenbeckia complexa* and *Oxalis exilis*.

In many areas on cool to neutral aspects at approximately 700 m a.s.l. briar cover gives way to a sward of introduced pasture species with scattered native short tussocks including *Poa cita*, *Festuca novae-zelandiae* and *Poa colensoi* (blue tussock). The occasional *Melicytus alpinus* (porcupine bush), *Olearia odorata*, *Aciphylla aurea* (golden Spaniard) and *Carmichaelia petriei* (native broom) remain in these areas.

Depleted lands on sunny north and north west facing aspects below 700 metres a.s.l. support a relatively diverse native and introduced flora, despite reduced vegetation stature and bare ground exceeding 50% over large areas. Native species include *Raoulia australis* (scab weed), *Raoulia apice nigra*, *Poa Maniototo*, *Vittadinia australis*, *Geranium sessiliflorum*, *Rytidosperma pumila*, *Epilobium spp* (willow herb) and *Leucopogon fraserii* (dwarf heath) and the native dryland fern *Cheilanthes sieberi*. *Poa cita* tussocks are present but rare.

Numerous steep gullies feed into the west flowing Lindis tributaries. The native shrub component in these gullies, although generally not diverse and usually mixed with briar, is greatest in the shadiest deepest gullies which have afforded maximum protection from fire and have probably been less attractive to rabbits and sheep. Shrublands dominated by native species are generally very narrow (<30 metres) with an understory dominated by introduced herbs and grasses. Sunnier more open gullies tend to be heavily dominated by *Rosa rubiginosa*. Native shrub species recorded in these refuges include, *Coprosma propinqua*, *Melicytus alpinus*, *Olearia odorata*, *O. lineata*, *Carmichaelia petriei* and *Discaria toumatou*. Shrubs are often clothed in *Rubis schmidelioides* (bush lawyer), *Clematis marata* and *Muehlenbeckia complexa*. Native species persisting at ground level include *Bulbinella angustifolia* (Maori Onion) (very common throughout), *Pteridium*

esculentum) (bracken), *Festuca nova-zelandiae*, *Aciphylla aurea*, *Acaena caesiiglauca* (bidibid), *Ranunculus hirtus*, *Blechnum penna-marina*. Ground cover is generally dominated by exotics. *Polystichum vestitum* (prickly shield fern) and *Urtica aspera* (a native nettle which is relatively rare in Central Otago) were observed in a deep west facing sunny gorge on Geordie Hills pastoral lease. This gully is highlighted on Map 2 (appendix).

A number of widely dispersed *Sophora microphylla* trees (Kowhai) were observed, all growing close to 800m a.s.l. No seedlings or young trees were observed in this topographical unit.

Significance of Vegetation

Although steep gullies retain a significant native component, with the exception of one finding of *Urtica aspera* (Geordie Hills pastoral lease) which is known from only 6 other locations, species composition is similar to elsewhere in the ecological district and is generally highly modified. Remnant areas of shrubland are located in areas unlikely to be threatened by foreseeable land uses.

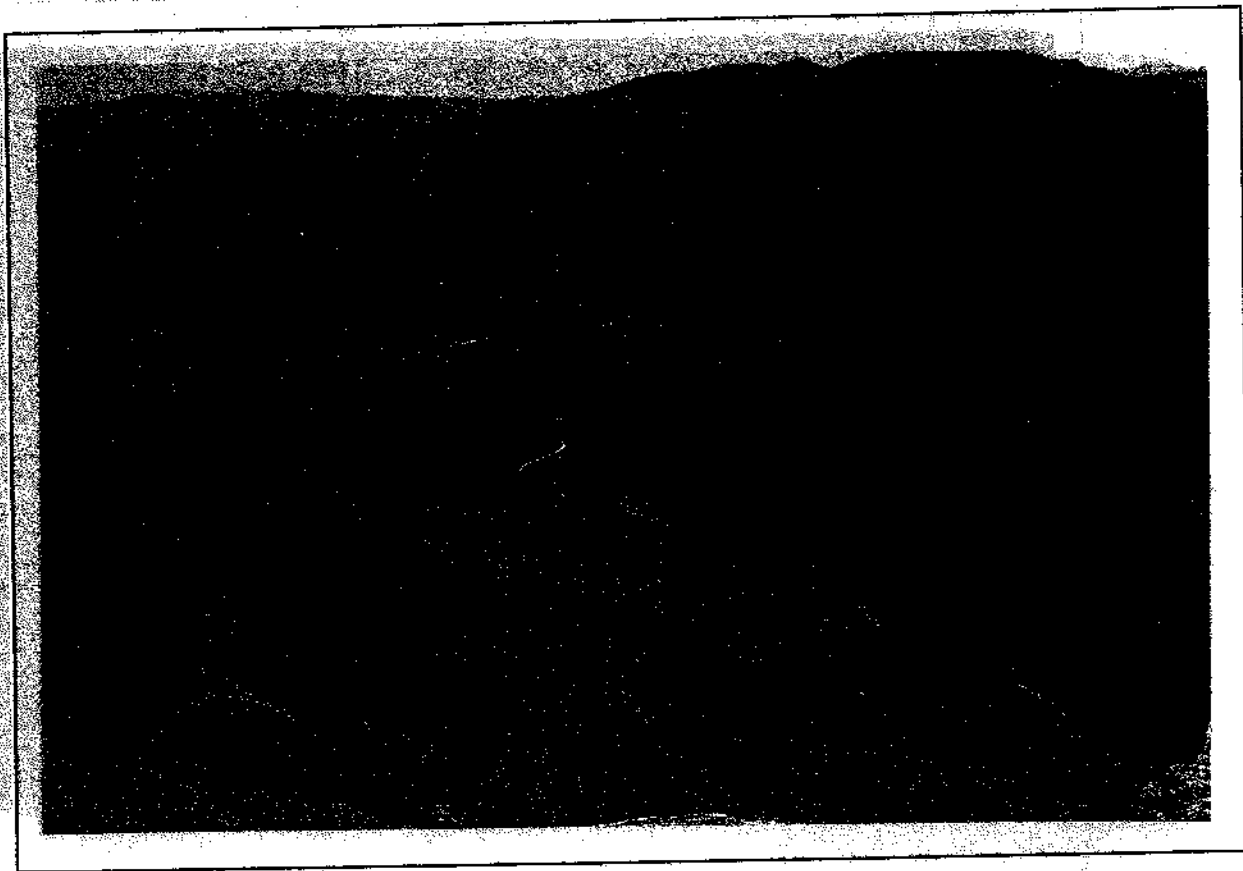


Photo Four. Marked contrast between sunny and dark aspects - Merivale/Longacre boundary

(c) **The mid reaches of Coal Creek, Tim Burn and Pleasant Valley.**

The mid reaches of Coal Creek, Tim Burn and Pleasant Valley are characterised by narrow (average 40 metre), flat valley floors bounded by gentle fans/colluvial slopes of similar width. These areas support a thick sward of introduced pasture species. Wet areas support *Carex coriacea*, *Juncus articulatus* and other common wetland species.

Scattered solitary large *Olearia odorata* trees/shrubs in an otherwise highly modified environment are a particular feature of this topographic unit.

Significance of Vegetation

The native component is low. *Olearia odorata* shrubs/trees appear to be persisting under current land management. Juvenile plants of this species are common.



Photo Five. Coal Creek Gorge - Timburn Pastoral Lease

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(d) A series of flats and gentle fans at the western base of the Chain Hills.

These areas are generally highly modified having largely been converted into pasture. *Discaria toumatou* appears to have vigorously responded to frequent fertiliser applications and forms a significant cover. In general, the upper (eastern most) flats are well drained and support scattered *Festuca novae-zelandiae* and *Poa cita* tussocks with a thick inter-tussock cover of introduced pasture species. Over much of the lower flats, drainage appears to be impeded by silt horizons in the soil profile.

Most wet areas are vegetated with a mix of exotic pasture, *Carex coriacea*, *Ranunculus gracilipes* and *Bulbinella angustifolia* and are heavily modified by stock. A small heavily modified remnant population of *Chionochloa rubra ssp cuprea* (copper tussock) is present on Shirlmar pastoral lease in the headwaters of Pleasant Valley. This remnant comprises approximately 20 plants within an estimated area of 1000m². Although most inter-tussock species comprise introduced grasses and herbs, native *Carex coriacea*, *C. petriei*, and *Bulbinella angustifolia* are also common.

Significance of Vegetation

A larger area of *Chionochloa rubra ssp cuprea* is present on nearby RAP Lindis A3 on the Chain Hills. This RAP is not on the Lindis group of properties and is not protected. Smaller areas of copper tussock are recorded in the ecological district in Lindis RAPs A2, A3 and B5 (all outside this group of properties and not protected). It is of note that this species has become depleted on dry soils in the east of the South Island. Whilst surviving on damp sites such as in the headwaters of Pleasant Valley, the species succumbs readily when grazing follows fire (Wardle 1991).

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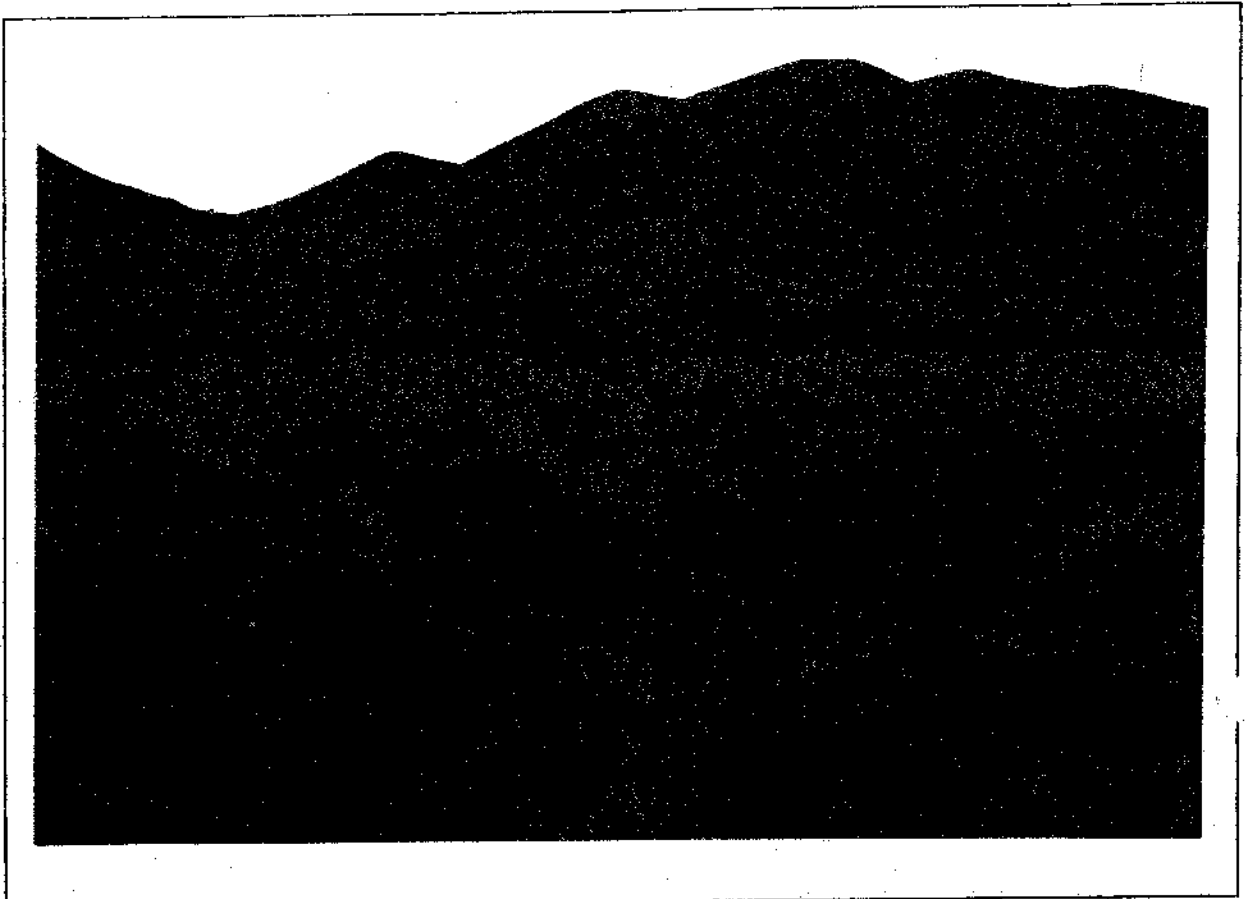


Photo Six. Copper Tussock (*Chionochloa rubra ssp cuprea*) - Shirimar Pastoral Lease

(e) The Chain Hills lie on the western side of these properties.

On the western flanks of the Chain Hills between 800 m a.s.l and the crest of the Chain Hills (approximately 1000 m.a.s.l) despite regular AOSTD, *Chionochloa rigida* is a common component of the flora (lower on cool aspects and higher on warm aspects). Other native species persisting include *Pimelea oreophila*, *Aciphylla aurea*, *Corallospartium crassicaule* (coral broom) *Acaena caesaglauca*, *Poa colensoi*, *Luzula rufa* (woodrush), *Festuca novae-zelandiae*, *Bulbinella angustifolia*, *Hydrocotyle nova-zelandiae*, *Viola cunninghamii*, *Anisotome flexuosa*, *Helichrysum filicaulae*, *Leucopogon fraseri*, *Cotula spp* and *Oreomyris colensoi*. The native component, which rarely exceeds an estimated 35% ground cover, tends to be highest on slopes with a cool southerly aspect. One large *Cassinia leptophylla* (tauhinu) was noted.

The exposed crest of the Chain Hills, although highly modified, supports scattered *Poa lindsayi* and *Carex breviculmis* plants on otherwise bare areas. *Pimelea traversii* and *Gnaphalium spp* persist on rock outcrops.

Many gullies support a strip of woody riparian shrubland often mixed with *Chionochloa rigida*. Shrublands contain a higher native component than in topographic component two. In most such areas *Olearia odorata* is the dominant species. It is of note that this species is often vigorously regenerating on shrubland margins. Other species present are *Discaria toumatou*, *Coprosma propinqua* and *Carmichaelia petriei*. At the base of some gullies *Discaria toumatou* is the dominant species with some specimens exceeding 4 metres in height. Ground cover in these areas is heavily dominated by exotic species.

Two shrublands are of particular note. 1. The upper Tim Burn (left branch) on Shirimar pastoral lease supports one of the largest (up to 150 metres wide and in excess of 800 metres long) most intact areas of *Olearia odorata* shrubland to be found on the six properties. The vegetation composition is similar to other gullies; however unlike many other shrublands it merges into a relatively intact *C. rigida* grassland in its upper reaches.

2. The second shrubland of note is located on Longacre pastoral lease on the western side of the Chain Hills. This area also a reasonably extensive area of *Olearia odorata* dominated shrublands. However its distinctive feature is that on its southern margin (warm northerly aspect) at least five mature *Sophora microphylla* (kowhai) trees (up to 40 cm diameter at breast height) and numerous juvenile and shrub sized specimens are present. Elsewhere this species tends to comprise solitary trees with no visible regeneration. It is possible that surrounding shrublands have protected seedlings from grazing by domestic stock.

Two areas at the northern and southern ends of the Chain Hills rise considerably higher than the main ridge crest. The western flanks of Mount Misery (1447m), and the south facing basin under the highest point on Shirimar (which adjoins Morvern Hills pastoral lease to the north), both support intact *Chionochloa macra* grasslands of moderate to good stature above 1200 m..a.s.l. *C. macra* ground cover exceeds 35% over much of these areas. Native species dominate inter-tussock cover. Native species recorded include *Gaultheria depressa* (snowberry), *Poa colensoi*, *Festuca nova zelandiae*, *Luzula migrata*, *Anisotome aromatica*, *Wahlenbergia albomarginata*, *Pimelea oreophila*, *Helichrysum filicaulae*, *Epilobium spp*, *Ourisia caespitosa* (not recorded in Lindis ecological district during PNA survey), *Kelleria dieffenbachii*, *Raoulia subsericea*, *Aciphylla aurea*, *A.monroi*, *Cotula imbricata*, *Brachyglottis haastii*, *Scleranthus uniflorus*, *Carmichaelia monroi*, *Leucopogon colensoi*, *Geranium sessiliflorum* *Brachyscome longiscapa* and *Pratia angulata*. The exotic component is generally low above 1200m a.s.l. *Hieracium pilosella* cover is generally less than 5%.

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The northernmost of the two high altitude areas (south facing basins) is of particular interest as it is the only area on the group of properties where *Olearia* shrublands are linked to *Chionochloa* grasslands by vegetation with a high natural component. Below 1200 m.a.s.l *C.macra* tussocks give way to *C.rigida*. Exotic pasture species form a significant component of the flora in the lower reaches of this south facing basin, although *C.rigida*, *Poa colensoi* and *Festuca nova-zelandiae* tussocks are common.

The eastern flanks of the Chain Hills are incised by a series of small sub-catchments of Dunstan Creek. Virtually the entire faces are subject to regular top dressing. Fire has not been employed as a farm management tool in recent times. Although there is a trend for vegetation to become increasingly modified from north to south (down Dunstan Creek), the dominant influence on vegetation is aspect. South to south east facing (north side of sub-catchments) support a relatively intact cover of *C.rigida* which often exceeds 60% (usually on mid slopes of sub-catchments). North and east facing (north side of sub-catchments and truncated spurs leading into Dunstan creek) have been subject to a great deal of disturbance resulting in a highly modified flora. Common native species remaining are *Poa cita*, *Festuca novae-zelandiae*, *Coprosma propinqua* and *Discaria toumatou*; the latter of which has probably vigorously spread as a response to aerial topdressing.

Several of the Dunstan Creek sub catchments contain heavily modified wetlands.

Significance of Vegetation

The flora over much of this topographic unit is heavily modified. However two areas of intact *C.macra* grasslands are of conservation significance. This tussock species which probably once formed a continuous belt between alpine herbfields and alpine cushionfields throughout Otago is now mostly confined to snowy south aspects and its cover is often depleted and disjunct. The area at the northern end of the Chain Hills (Shirlmar pastoral lease) is of particular significance as it is linked to an area of relatively natural vegetation. *Olearia* shrublands at valley floor level merge with a relatively modified grassland with a short tussock component on lower slopes, *C.rigida* grasslands on mid slopes and *C.Macra* on upper slopes. *Olearia* shrubland remnants are probably indicative of shrublands that were widespread prior to Polynesian fires and early pastoral activity.

C.rigida grasslands on shady aspects in Dunstan Creek (Shirlmar, Longacre and Timburn pastoral leases) are of conservation significance due to their relative intactness and predominance of native inter- tussock species.

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The *Sophora microphylla*/*Olearia odorata* shrubland on Longacre pastoral lease is of significance as it is one of the largest areas of both species on the six properties. The presence of juveniles of both species is also important. *Sophora microphylla* seedlings and saplings were not observed elsewhere where mature specimens are present.

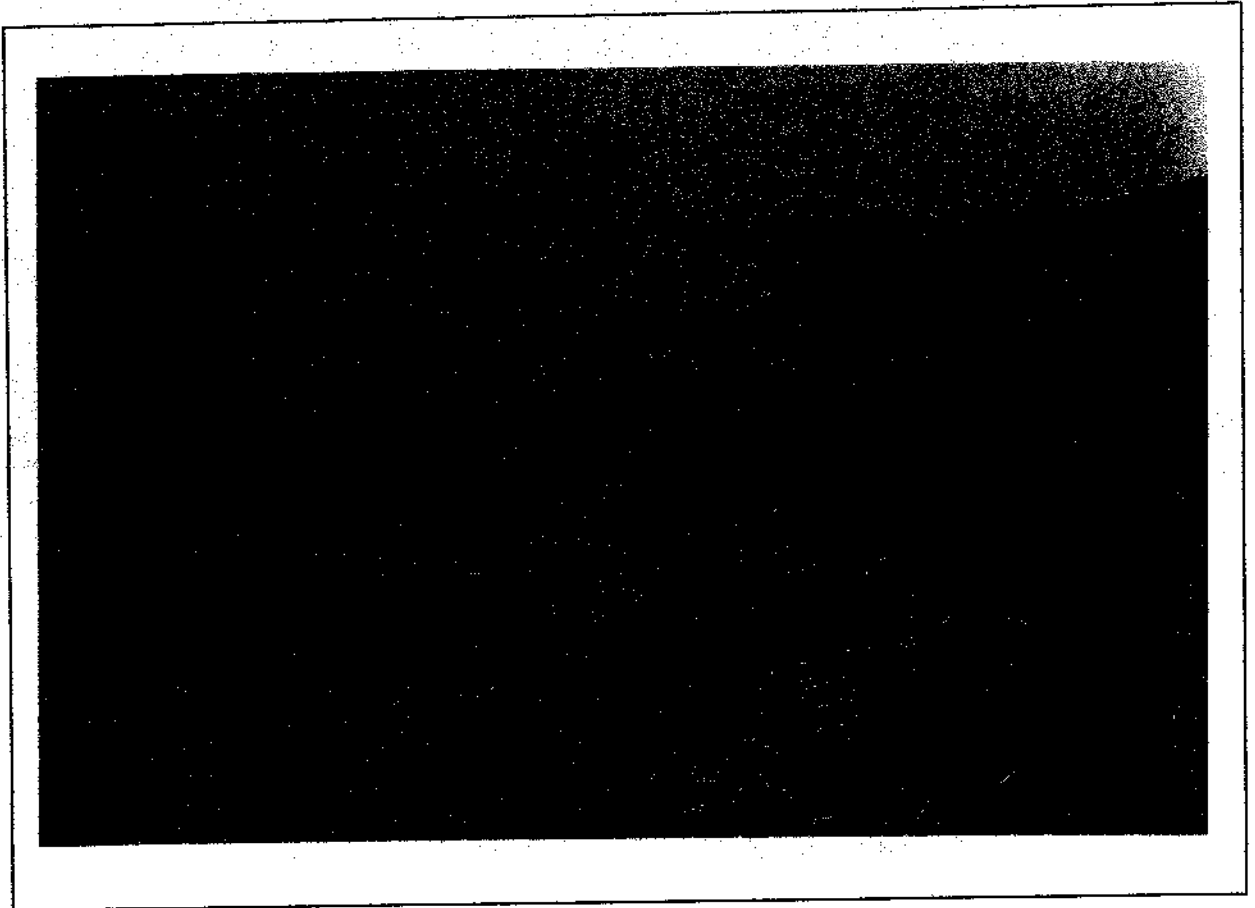


Photo Seven. Intact slim snow tussock (*Chionochloa macra*) grasslands - Timburn Pastoral Lease

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Photo Eight. Eastern flanks of Chain Hills - note highly modified sunny faces and relatively intact narrow leaved snow tussock (*Chionochloa rigida*) on shady aspects

- (f) Small areas of flats and fans on the east side of Dunstan Creek on Shirimar, Timburn and Longacre pastoral leases.

The small areas of well drained flats and alluvial fans on the Dunstan Creek Valley floor which are within the Lindis pastoral leases, support a depleted short tussock cover (*Festuca novae zelandiae*). *Hieracium pilosella* forms a significant cover in conjunction with exotic grasses. Common native species include *Discaria toumatou*, *Leucopogon fraseri* and *Pimelea oreophila*. Old river channels, some of which are fed with water from the current Dunstan Creek channel, comprise small wetlands.

Significance of Vegetation

This vegetation component is highly modified and is widespread on valley floors throughout Central Otago. It is considered that the short tussock component is likely to be on the decline, a feature which has been observed elsewhere in the high country irrespective of land management.

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(g) **Nine Mile.**

Nine Mile retains minimal natural values. Virtually the entire property has been oversown or cultivated at some stage. Below 1000 metres much of the property supports a thick sward of oversown species. Flats and rolling country adjacent to Phillips Road and opposite Goodger Road have been cultivated. Large areas of briar on gentle to moderate hill slopes have been root raked.

Two small patches of *Kunzea ericoides* shrubland remain on rocky areas with little top soil. These areas represent the only kanuka observed on the six pastoral leases. Other native species growing amongst the kanuka include matagouri, bracken, *Herpolirion novae-zelandiae* (grass lily), and the fern *Asplenium richardii*. The largest of the two kanuka areas at 760 m.a.s.l on the true right of Eight Mile Creek covers approximately 2 ha.

Components of native vegetation remain on rock outcrops and gully areas throughout the property. Between 900 m.a.s.l and the summit of Lindis peak at 1226 m.a.s.l, the native component of the flora generally increases, as does the cover of *Hieracium lepidulum* (tussock hawkweed). Native species persisting in grasslands include *Festuca novae-zelandiae*, *Carmichaelia petriei* and the occasional *Corallospartium crassicaule* (coral broom). The apparent absence of *Chionochloa rigida* on the property is of note.

Rocky outcrops (refugia) on the upper reaches of the property support a range of native species, including a greater component of species associated with wetter western Otago. The presence of *Helichrysum intermedium* is of interest. Other native species present in these refuges include *Coprosma propinqua*, *Hebe buchananii*, *Pimelea traversii*, *Meliccytus alpinus*, *Raoulia australis*, *Asplenium richardii*, *Asplenium flabellifolium*, *Celmisia gracilentia*, *Brachyglottis bellidioides*, *Poa colensoi*, *Luzula rufa*, *Anisotome flexuosa*, *Leucopogon fraserii*, *Scleranthus uniflorus* and *Celmisia prorepens*.

Significance of Vegetation

Nine Mile pastoral lease is one of the most developed pastoral leases in Otago. Rocky refugia which support a remnant native flora are not threatened by any foreseeable land management activity. Species present in these refugia are well represented within the conservation estate.

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Small kanuka shrubland remnants are of some significance, as this vegetation type is the climatic vegetation of the area following early Polynesian fires (Wardle 1991). However much larger areas are present in nearby locations outside of this group of properties.

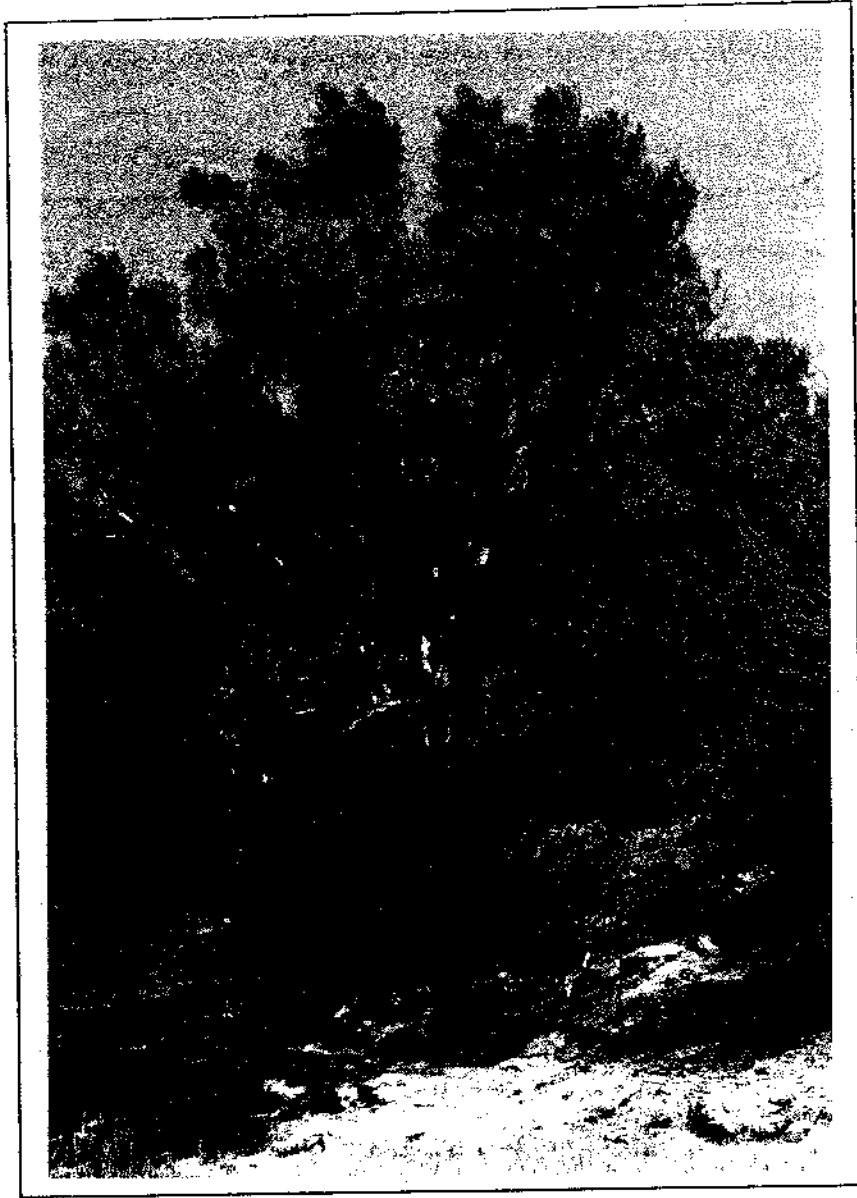


Photo 9. Kanuka remnant - Nine Mile Pastoral Lease

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Photo Ten. *Helichrysum intermedium* on rocky outcrop - Nine Mile Pastoral Lease

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5 FAUNA

Invertebrate values

The Lindis Pass region between Dunstan Creek (east) and the Lindis River (west) has several key ecosystems for Otago conservancy invertebrates.

Dunstan Creek and tributary streams

The Dunstan Creek flats are an important system for insects inhabiting open damp herbfield and stony areas (e.g. the moth *Asaphodes prasinias*). The butterfly fauna and many moths require open stony areas to bask and for this reason are common and diverse in this habitat. The broad unshaded reaches of Dunstan Creek bear similarities to Canterbury Rivers and may well support southern representatives of Canterbury aquatic insects. The tributaries of Dunstan Creek that lead in from the Chain Hills contain a small stream fauna representative of Otago including some upland elements (e.g. the stoner *Zealandobius macburneyi*).

Alpine fauna

The alpine fauna above 1100 m on the Chain Hills has some interesting elements including large earthworms (*Octochaetus* species) which inhabit tussocklands/herbfields. These worms have disappeared from parts of Otago. *Notoreas paradelpha* is an active day flying moth whose plant host, *Pimelea oreophila* is common amongst snow tussock in this zone. The ground predator beetle *Metaglymma tibiale* (a burrower in periodically dry areas in Otago) is restricted to mountain tops in this area.

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Low hills to the west of Chain Hills

Shrublands

Further to the west, shrublands dominated by *Discaria toumatou*, *Rosa rubiginosa* and *Olearia odorata* are rich in insects and spiders. *O.odorata* and *O. lineata* support a particularly rich invertebrate fauna including crab spiders (Thomisidae, *Diaea* species), leaf beetles (Chrysomelidae), hoverflies (Syrphidae) and caterpillars of various moths including *Pseudocoremia cineracia* (a rarely found species). These bright green shrubs are also attractive to aquatic insect adults dispersing and mating.

Dry grasslands

Despite a high level of modification, dry faces are vegetated by short grasslands and herbfields which retain elements of their pre disturbance insect fauna including support stiletto flies, day flying moths, tiger beetles and grasshoppers. These are all insects which bask. Some moth species which are obligatory feeders on *Raoulia*, *Kelleria*, *Pimelea* and *Vittadinia* plants are also present.

Kanuka shrubland with associated short grassland/herbfield on Nine Mile

Juvenile stick insects were found amongst *Rubus schmidelioides* (lawyer vines) on kanuka. Other kanuka insects were not noted. However, short herbfield surrounding the shrubland is good habitat for the colourful low alpine moths *Arctesthes catapyrrha* and *Paranotoreas brephosata* and the Stiletto fly *Anabarhynchus limbatinervis*.

Significance of Invertebrate Fauna

Diversity in the native invertebrate fauna appears to be closely linked to botanical values. Remnant areas of native vegetation, at high altitude and in gullies which have served as fire refuges, retain important components of an insect fauna (including aquatic insects) which would have once been widespread throughout the Lindis Ecological District.

Avi Fauna: Paradise ducks, New Zealand falcons, Californian quail, redpole, grey warblers, Chukar, black shag rookery.

Significance of Avi-fauna

The New Zealand falcon is a category B threatened species and as such is an important record.

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Aquatic fauna

Five freshwater fish species were recorded from the area, comprising two native species, the upland bully (*Gobiomorphus breviceps*) and the flathead galaxias (*Galaxias depressiceps*) and three introduced species, brown trout (*Salmo trutta*), rainbow trout (*Oncorhynchus mykiss*) and brook char (*Salvelinus fontinalis*). The most widespread species is brown trout which occurs in Long Spur Creek, Tim Burn and its tributaries, Coal Creek, Cluden Stream and Dunstan Creek and its tributaries. The other four species are either rare or are of restricted distribution. The flathead galaxias only occurs in areas where introduced salmonids are absent. These areas comprise the upper reaches of Short Spur Creek, one Tim Burn tributary, Coal Creek and one Coal Creek tributary (see map 2 for location). Flathead distribution is depicted on Map 2. The upland bully is found throughout the Tim Burn with highest densities occurring in the salmonid free areas. Brook char are restricted to Dunstan Creek and its tributaries, where its range is determined by the extent of permanent water. Rainbow trout occur in both Dunstan Creek and Cluden Stream but are rare.

Significance of Aquatic Fauna

From an aquatic fauna perspective the streams containing the flathead galaxias have the highest conservation values on the properties, especially the Tim Burn tributary (Shirlmar and Merivale pastoral leases) containing upland bullies with the flatheads. The galaxiids in this stream are not numerous but are in good condition while the upland bullies are amongst the largest recorded for the species anywhere. Flathead galaxias is restricted to Otago and Southland and is the only non-migratory galaxiid known from the upper Clutha catchment, its range in this region is very much reduced from its estimated pre-European distribution. Only six remnant populations are known from the upper Clutha, although more are likely to exist in the Lindis catchment. The status of such populations (if any) is unknown. Upper Clutha flathead galaxias populations appear to be morphologically distinct from other flathead populations and as such, protection of these populations is important to maintain the full range of diversity within the species.

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6. HISTORIC VALUES

Nine Mile

Introduction: A field inspection of historic sites on all leases was carried out on the 12th and 13th of November 1996. The area has been the subject of two previous site surveys; in 1977 by M Newman and P Croad of the Ministry of Works, and in 1984 by C Jacomb and S Easdale of the Department of Lands and Survey. The current survey primarily consisted of field checking the previously recorded sites although at least one new site was recorded.

Maori sites: No Maori sites are known to exist on the Nine Mile lease. Despite this lack of recorded sites, there is no doubt that the Lindis region was of significance to Maori. The Lindis Pass was an important route between the Waitaki and Clutha valleys. The usual route seems to have been up Longslip Creek from the Ahuriri, down the Pass Burn to the Lindis River and then over Mount Grandview to Lake Hawea. This is the route given in Stevenson (1947:49) and that which was taken by the surveyor Thompson in 1857 when following directions given by Reko of Tutarau (Duff 1978:pp19-20).

European History: The first pakeha to reach the upper Clutha region was Nathaniel Chalmers who entered the area in 1853. He was accompanied by two Maori; Reko and Kaikoura. After reaching Lake Hawea via the Mataura, Nevis and Kawarau valleys Chalmers, who was suffering from acute diarrhoea, was rafted down the Clutha River on a flax mokihi (ibid:pp18-19). The first pakeha to enter the Lindis Valley was the Provincial Surveyor John Turnbull Thompson who came via the Waitaki valley in 1857 following directions given by Reko. After reaching Lake Hawea via the Grandview route he returned to the Waitaki valley by the Lindis valley naming various creeks and streams including the Lindis, Tarris, Cluden and Timburn (ibid:pp19-20).

The following year John McLean, a Scotsman who had originally settled in Australia, guided by Huruhuru from the Waitaki, crossed the Lindis Pass searching for grazing land. Ultimately four grazing licences were leased to McLean, his two brothers and his sister (runs 235, 236, 237, 238). These became the Morven Hills Station of 352000 acres. It stretched from the Cromwell Gorge to the Lindis Pass and from Lake Hawea to the Dunstan Mountains and Dunstan Creek.

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In 1874 the McLeans sold Morven Hills to Colonel Whitmore for £128000 (by this stage there were 140000 sheep on the property). Whitmore then on sold the run within a few weeks to the owner of Lauder Station. The following year it was sold to F. G. Dalgety of London who built a business empire around sheep stations in Australia and New Zealand. In 1910 Morven Hills was broken up for closer settlement and 25 runs were balloted for. Run 236 I (Nine Mile) was successfully balloted for by Joe Miller (ibid:pp34, 48-52).

In 1861 the Lindis River was the scene of the first gold rush in Otago. Thompson had found traces of gold in the Lindis during his survey (AJHR 1863 D6:3) but this discovery along with several others that were made during the 1850s were largely ignored by the population and Provincial Council of Otago. However in March 1861 the gold of the Lindis was rediscovered. The Provincial Council had undertaken to improve the access to Morven Hills and employed a gang of road makers. Among them was Samuel McIntyre who had experience in the California gold fields. McIntyre believed the area was auriferous because of its similarity to the gold bearing regions of California (Otago Witness 4/5/1861:5). The gold obtained was flaky but some nuggets were found up to the size of a bean. Research indicates that this find was at the northern end of Goodger's Flat near the old road bridge (Jacomb & Easdale 1984:3).

News of the discovery was published in the Lyttleton Times (John McLean was visiting his sister in Christchurch and released the story). News of the diggings appeared in the Otago Witness newspaper on April 20th. By then there were an estimated 300 miners present, with the main access being up the Waitaki valley and over the pass. The diggings were said to be located in the first gorge of the Lindis. Some parties seem to have been doing reasonably well; Docherty and Falconer said they were getting an ounce a day each (Otago Witness 20/4/1861:5). One party of miners, the Pioneer Company, had commenced work turning the river out of its channel to expose the river bed.

By the 27th of April a store had opened and two more were expected to open soon (Otago Witness 25/5/1861:5). By the 23rd of May the population was approximately 300 and the general opinion was that the prospects for the field were good. Some miners were reportedly clearing 30 shillings a day. The reporter also noted that many came and left barely having put a pick in the ground (Otago Witness 8/6/1861:5). Ironically the notification of Gabriel Read's discovery of the Tuapeka field appeared in the paper in the same column as this report.

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A brief report in July noted that the Lindis was deserted (Otago Witness 20/7/1861:5). The Lindis rush ultimately failed because of the remoteness of the area at the time of the find and the resulting high cost of supplies and the comparative richness of the new field where some parties were getting several ounces a day (compared to the Lindis where it seems that half to one ounce a day was considered good).

Yet the Lindis was never abandoned completely as a gold field. In December 1861 the population was only one; the storekeeper. Six weeks later there were, in addition to the storekeeper, four miners who had returned to the workings; McMasters, Davies, Docherty and Watson (Duff 1978:69-70). Throughout the 1860s there were reports of new finds in the Lindis and its tributaries but none resulted in sustained mining. During the 1890s Chinese miners worked the area of the original rush and a few European miners were also active in the area. For a brief period a small dredge worked the river along Goodger's Flat in 1901, but the returns were disappointing and the dredge was closed down in November and dismantled. During the depression years of the 1930s, there was a renewed interest in the gold of the Lindis. Attracted by a subsidy paid by the government up to 30 unemployed workers lived in a tent camp on the terrace opposite the mouth of Camp Creek. In return for 30 shillings a week the miners were allowed to keep a proportion of any gold found, the rest going to the government. This subsidised scheme was ended in 1935. The last miner to work in this area was Wattie Thompson who lived in a concrete hut near the old (Faithfulls) bridge over the Lindis and worked in the Camp Creek area for several years after World War Two before moving to Bendigo creek and then Luggate (ibid.:94-95).

Recorded sites: As mentioned in the introduction an attempt was made to visit all previously recorded sites. Not all were located but other sites were found that had not been previously described. However this report should not be seen as an exhaustive survey of the area. The site numbers given are the New Zealand Archaeological Association site recording scheme numbers. Grid references are to the 1:50000 map sheet G40.

G40/51 (310 994) Gold workings. Site marked as #1 on appended Map 2A: Situated on the true right bank of the Nine Mile Creek. The site consists of two hut sites and associated gold workings. All that remains of the huts are the stacked schist fireplaces. There is a small water race, two small ground sluiced areas and a trench along the creek in the vicinity of the hut sites.

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Tent/hut site (335 013). Site marked as #2 on appended Map 2A - previously unrecorded: Partially excavated into the base of a terrace riser. An area approximately 3m x 5m is enclosed on three sides by a low earth wall. A few stones visible in one corner may be the remains of a fire place. In another corner is a probable door way.

G40/53 Hut sites (332 030). Site marked as #3 on appended Map 2A: Located in a small gully immediately west of the Goodger Flat access road. The site consists of two stacked stone fireplaces/chimneys on small terraces partially excavated into the side of the hill.

G40/22 Gold workings (328 046) Site marked as #4 on appended Map 2A: Located in a paddock at the southern end of Goodger's Flat between the road and the river. The site consists of a seasonal water course that has been revetted in places. Irregular piles of vegetated tailings are present on either side. The site occupies an area about 80m long by 20m wide. The surrounding area has been ploughed.

G40/19 Stone Cottage (320 055) Site marked as #5 on appended Map 2A: A stone building of split schist and mud mortar construction. The building is by with massive willow trees. The rear wall has been broken down by a falling tree but the rest of the walls stand to their original height. However the building is on the verge of collapse and is endangered by the surrounding willows.

G40/18 Lindis Pass Hotel (323 061) Site marked as #6 on appended: The Lindis Pass Hotel is an extensive stone ruin lying between the road and the river at the northern end of Goodger's Flat. The building is still largely intact with the walls and gables rising to there full height (2m and 3.5m respectively). But several walls have developed leans and most of the wooden window lintels are broken or rotten and the building must inevitably begin to collapse. There are two out buildings; a small shed immediately adjacent to the hotel and a garage or stable a short distance away. The stable still has a corrugated iron roof and has a partial frame of wood.

According to Duff (1978:96-97) the hotel had its origins in a store set up during the first rush. By 1873 a permanent building had been set on the site. The building was gradually added to over the years before ending its days as a residence for an employee of the local rabbit board in 1951. For a more detailed history of the building see Duff (1978) and Jacomb and Easdale (1984).

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There are several other features on the same terrace as the hotel including a drain, possible tent sites and small excavations into the bank. It should be noted that a triangle of land around the hotel and extending up the river is not part of the pastoral lease.



Photo Eleven. Lindis Hotel ruins - freehold land adjacent to Nine Mile Pastoral Lease

G40/14 Gold workings (320 065) Site marked as #7 on appended Map 2A: These workings are on the true right bank of the Lindis, immediately upstream of the old road bridge. They consist of piles of tailings from ground sluicings and two drives (tunnels) into the hillside. The tailings piles get progressively larger towards the northern end of the workings. High river levels have eroded parts of the tailings. These workings were supplied with water by a race coming out of Camp Creek; little trace of which now remains.

This is one of few mining sites in the Lindis area which can be given a relatively firm date. The race and workings are present on a map held by the National Archives dating to 1873.

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At the southern end of the workings is Wattie Thompson's concrete hut. When the area was surveyed in 1984 by Jacomb and Easdale there were additional workings visible in the bed of the river. These consisted of three diversion channels where the flow of the river had been diverted into one half of the bed allowing the other half to be worked. Since then flooding has destroyed or obscured two of these and only the one below the old bridge is now plainly visible. The old bridge has also been largely destroyed by flooding.

G40/15 Gold workings (313 065) Site marked as #8 on appended Map 2A: These are located on the true right of the Lindis at the junction with Camp Creek. The site consists of several ground sluicings on a terrace extending for about 80m up the true left of Camp Creek. The sluice pits vary in size from 10m by 8m in area up to 20m by 25m, with a maximum depth of about 6m (although most are much shallower). They were supplied with water by a race (or races?) from Camp Creek. A little downstream of the junction, on the true right of the Lindis, is a 20m long section of revetting where slabs of stone have been stacked vertically to reinforce the river bank. This was probably done when the bed of the river was being worked and may predate the workings described above.

These workings are largely the result of depression mining during the 1930s. A camp was set up on the point of land opposite the sluicings (now largely destroyed by roading activities). According to Duff, Wattie Thompson also worked in Camp Creek (Duff 1978:95) as did other European miners during the 1890s but a photograph of the 1930s miner's camp clearly shows the area being worked with several tents set up on the site.

Most of the sites recorded during the survey are associated with gold mining. However it is difficult to determine whether they are associated with the original rush of 1861 or subsequent years. The earliest workings which can be reliably dated are those upstream of the old road bridge which predate 1872 - 73. The Camp Creek workings are known to date primarily from the 1930s. Most of the other sites are almost certainly of late 19th century origins. Therefore all the recorded sites, with the exception of the Camp Creek workings, are protected under the 1993 Historic Places Act which gives automatic protection to all sites predating 1900.

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Geordie Hills

Introduction: The area has been the subject of two previous site surveys; in 1977 by M Newman and P Croad of the Ministry of Works, and in 1984 by C Jacomb and S Easdale of the Department of Lands and Survey (Jacomb & Easdale 1984). The current survey primarily consisted of field checking the previously recorded sites although at least one new site was recorded.

Historical Background: For a brief historical background to the general area of Geordie Hills refer to the preceding section on Nine Mile Pastoral lease.

The western end of Georges Flat, along the Lindis river, was part of the area rushed in April 1861 when news of the discovery of gold by a road building party became widely known.

Recorded Sites: Two sites on Geordie Hills have been recorded in the New Zealand Archaeological Association site recording scheme: G40/10 House site, and G40/20 Chinese Graves. Of these, only the house site was relocated during this survey. The graves were originally recorded on the basis of hearsay evidence only but are supposedly located in the vicinity of the confluence of Long Spur creek and the Lindis river.

G40/10 (GR 345 068) House site: This site is on the true left of Long Spur creek (see appended Map 2A). According to the site record form this was a 3 acre house site and probably originally a Morven Hills shepherds cottage. In 1977 all that remained were 2 plum trees and an oven. Only the plum trees could be located during the current survey.

During the 1984 survey by Easdale and Jacomb an extensive area of tailings was recorded on a low terrace on the true left of the Lindis river upstream from its confluence with Long Spur creek (grid ref. 325 060). This was described as being "hummocky with excavation holes and tailings heaps. Many channels and some stone work can be found within the tailings..." (Jacomb and Easdale 1984: 4). During the current survey little evidence of this site could be located as much of the terrace has been heavily modified by flood damage. The edge of the terrace has been sluiced and a series of small poorly defined tail races feed in to a main tail race. At the northern end of these workings is a possible tent site which has been partially excavated into the ground.

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One previously unrecorded site was located during the survey. This site is marked as G40/211 on appended Map 2A. This was an area of sluicing on the true left bank of the Lindis river about a kilometre north of Elliotts bridge on the main road (grid ref: 336 018). The sluicings are about 80m long and up to 20m wide and are fed by a small race from a tributary creek.

Three sites were visited during the survey. Little remains of the old house site up Long Spur creek but the two mining sites are clearly visible. The house site is assumed to have been associated with Morven Hills station and the mining sites are almost certainly of 19th century origins. Therefore all three sites are protected under the 1993 Historic Places Act.

Longacre

Introduction: As the area had been previously surveyed in 1977 by Newman and Croad of the Ministry of Works the current survey consisted primarily of a field check of previously recorded sites.

Historical Background: For a brief historical background to the general area of Longacre refer the previous on Nine Mile Pastoral lease.

Recorded sites: Three sites were recorded during the 1977 survey: G40/54 - stone stock yards, G40/55 - house site and G40/70 - stone hut. Of these, the stock yards and the stone hut were relocated. The house site was not found; the 1977 recorders were also unable to locate the site and had recorded it on the basis of information provided by Mr. Davis, the lessee.

G40/54 - Map 2A (GR 368 012) Stone stock yards: These yards are approximately 42m by 39m in area and are between 1 and 1.5m high. The walls are of double dyke construction (two stone walls with a rubble core) with a row of cap stones stacked on edge. The walls are reasonable condition but have collapsed in several places. On the northern and eastern sides of the yards are the remains of a second enclosure (approximately 75m long on each side).

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G40/70- Map 2A (GR 371 016) Stone hut: This site consists of the remains of a two roomed stone hut. This is probably a Morven Hills musterer's or boundary rider's hut. Overall dimensions are approximately 8m by 4m. The most notable feature of the hut is the chimney which is of round construction. It still stands to its original height of about 4m but is on the edge of total collapse. Duff in his history of the Tarras area and Morven Hills Station notes that a hut with a hexagonal chimney formerly existed at Dip Creek, a tributary of the Pass Burn (Duff 1978:26). This account of an octagonal chimney and the round chimney of the above hut suggest that they may have been built by the same mason.

Both the stone yards and the stone hut were probably part of the original Morven Hills run. There is little doubt that they predate 1900 and are therefore protected by the 1993 Historic Places Act.

Merivale

Introduction: As the area had been previously surveyed in 1977 by Newman and Croad of the Ministry of Works the current survey consisted primarily of a field check of previously recorded sites.

Historical Background: For a brief historical background to the general area of Merivale refer to the previous section on Nine Mile Pastoral lease.

Recorded Sites: One previously recorded site was visited:

G40/69 (GR 394 038) Stone hut site. This is located on the true left of the left branch of the Tim Burn. The hut is approximately 4m by 3m in area and has been built against a large schist boulder which provides the western wall. There is no obvious fireplace but there is a stone bench in one corner at the western end. The original structure of the hut is difficult to work out as the walls had been pushed over to form a pile of rubble in the centre. The lessee has dug out the rubble and restacked the walls.

Associated with this hut are 2 small stone structures. One is free standing and the other is built against another schist boulder. There is no known history for this hut site; the site record form indicates that it was already derelict in 1908.

The recorded hut site is of unknown age but almost certainly predates 1900 and is therefore protected by the 1993 Historic Places Act. The site is a typical example of a site type that is numerous in Central Otago. In addition it is no longer in original condition, having been largely rebuilt, and has no known history (see appended Map 2A).

Shirlmar

The only historic site recorded on Shirlmar is an open cast lignite coal pit. The deposit was discovered in 1899 and was worked in 1900 by dredge operators as a possible source of fuel for a dredge on the Lindis but was abandoned. Worked intermittently but not commercially until after world war II at which time a bulldozer was utilised (pers.comm.Mr G.Duff).

Significance of Historic Sites

- The gold workings near the Old Lindis Bridge on Nine Mile (marked as #7 on Map 2A) are of historical significance as they are the oldest known in the area and are in the vicinity of what is assumed to be the original gold strike. If they do not date back to the original rush of 1861, they were certainly formed soon after and are of significance as evidence of the first gold rush in Otago. The Lindis Pass Hotel ruin (marked as #6 on Map 2A) sited on adjoining freehold land is also believed to date back to the original Lindis gold rush, has a colourful history, is relatively intact and is a popular site for picnicking and camping.
- The workings on Nine Mile pastoral lease, at the Mouth of Camp Creek on the western side of the Lindis (marked as #8 on Map 2A) are of historic significance as an example of the depression period mining that many unemployed men in Otago were engaged in. These workings are also notable in that they are indistinguishable to the type of mining that was carried out 70 years earlier by the original miners of the 1860s. The site is not protected under the 1993 Historic Places Act.
- Two gold mining sites to the east of the Lindis River (Geordie Hills pastoral lease) are of historical importance as they date back to the original Lindis gold rush. Of the two sites, the previously unrecorded site 1km north of Eliots Bridge is the most complete.

7 EXISTING LAND STATUS/ STATUTORY MATTERS

Current land status is depicted on Maps 1 and 1A (appendix).

7(a) Marginal strips

The eastern bank of the Lindis River is bordered by a discontinuous strip of Crown land, marginal strip, legal road and DOC stewardship land. In many places SH 8 bounds the Lindis river and provides adequate public access. However at the northern end of Geordie Hills pastoral lease the river is separated from SH8 for over 2km by flats on the western side of the road.

The lower reaches of the Tim Burn (Merivale and Longacre) are subject to a marginal strip. Marginal strips may also be required in Camp Creek and Long Spur Creek (lower reaches). All streams will be assessed for marginal strip requirements at time of survey.

7(b) Roads

The area occupied by the group of properties is characterised by a network of legal roads (both formed and unformed). Some of these roads lie on practical access routes, others fulfil no foreseeable purpose. A summary of the situation follows:

Formed Legal Roads: State Highway 8 runs adjacent to the Lindis River and appears to be located on a legal road line. Goodger Road appears to correspond to the legal road line up the Short Spur Creek Valley from the Lindis Valley through Shirlmar, past the homestead and then runs southwards over three low saddles through Merivale as far as a set of yards and a hut at the head the right branch of the Tim Burn. At this point the legal road deviates significantly from the formed road (through Longacre and Timburn pastoral leases) for significant sections. The legal road line proceeds to the Richmond Valley, beyond to Dunstan Pass and down into Dunstan Creek (not the most practical route to the area). From the Richmond Valley, another unformed legal road proceeds into Cluden pastoral lease and onto the southern end of the Chain Hills at the base of the North Dunstan Mountains.

Other legal formed roads are: the Timburn road, a loop road from State Highway which accesses Merivale, Longacre and Timburn homesteads; the old State Highway 8 route on the western side of the Lindis River (Nine Mile pastoral Lease) past the old Lindis Hotel and historic mining sites. The Lindis River bridge at the northern end of this section of road has recently been removed. A farm track running westwards through Nine Mile pastoral lease to the boundary and beyond is closely aligned to a legal road, this track links with farm tracks on other properties (not legal roads) which provide access possibilities to Lake Hawea. The transmission pylon track which heads north into Morvern Hills off Goodger road from near Poulsons Hut lies close to a legal road line on the Shirlmar-Morvern Hills boundary. A farm track along the crest of McPhies ridge (Timburn pastoral lease) coincides with a legal road for approximately 5km but is not connected by practical legal access at either end.

Several other unformed legal roads bear no relation to formed tracks (refer Map 1).

7(c) Runplans and the Rabbit and Land Management Program

Longacre, Merivale, Timburn, Geordie Hills and Nine mile were part of the government sponsored Rabbit and Land Management Program and accordingly have Land Improvement Agreements registered on their titles. There are no remaining commitments from earlier Catchment Board Run Plan agreements.

7(d) District Plan

The property is within the area administered by the Central Otago District Council under the Vincent section of the councils transitional plan which is currently operative. The entire area occupied by the six pastoral leases is zoned 'Rural 1' which is the general rural zone of most rural lands in the area. In addition to agricultural use of the land, provision is made for a range of conditional uses. The zone recognises that landscape qualities are an asset for recreation and tourism and the desirability of maintaining a high level of visual amenity throughout the rural area. Rural 1 includes provisions for reserves as defined by the Reserves Act (1977)

(ii) Draft Plan.

A draft plan for Central Otago District is currently under preparation. Limited public input has been sought on some components of the plan although public consultation on a draft plan is still to occur.

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7(e) Current Protection Status of Conservation/Historic Values

There is currently no formal protection for natural values on any of the six properties.

All recorded historic sites on Nile Mile (with the exception of the Camp Creek gold workings), Geordie Hills, Longacre and Merivale are protected under the 1993 Historic Places Act which gives automatic protection to all sites predating 1900.

8 RECREATION/ACCESS

With the exception of camping and day use of the Lindis River margins, because of the relative isolation of these properties from a major town or tourist centre and the lack of practical legal access into Dunstan Creek, the area is not subject to a high degree of recreational use. However for those who go to the effort of researching the area and to seek permission from runholders, some magnificent recreational opportunities area available. Dunstan Creek with its open landscape and wilderness qualities provides a high quality recreational experience.

8(a) Access

Marginal strips and Crown land on the Lindis River are frequently utilised for public access, picnicking etc, especially where these areas bound with SH 8.

Public use of legal roads is currently confined to those which are formed. Goodger Road/County Road receives limited use by motorists. Timburn Road receives little public use, as access beyond the Timburn homestead is subject to permission.

The old SH 8 route through Nine Mile pastoral lease gets little use since the removal of the old Lindis River bridge near the Old Lindis Hotel site.

The transmission pylon track which heads north into Morvern Hills off Goodger road from near Poulsons Hut, lies close to a legal road line on the Shirlmar-Morvern Hills boundary and is subject to periodic use by mountain bikers

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8(b) Uses

A relatively popular two day trip for mountain bikers is to bike up Dunstan Creek from near St Bathans township and to cross the Chain Hills (permission required from runholders) to State Highway 8 via one of several routes including Cluden Stream (Cluden pastoral lease), Coal Creek, Pleasant Valley, Tim Burn or Goodger Road (Short Spur Creek). This route was also popular with 4WD vehicle owners until 1995, when the track up Dunstan Creek was badly washed out in many places during heavy flooding. 4WD clubs have periodically granted access to a number of tracks within the group of properties. Routes into Dunstan Creek are also well suited to horse trekkers.

The Chain Hills represent an obvious access route onto the Dunstan Range to the north and the Dunstan Mountains to the south.

Walkers are reported to periodically ascend Lindis Peak (Nine Mile Station) via the main central farm track which starts near the homestead. Some walkers descend by an alternative route directly down the northern boundary and down to the old Lindis Hotel site adjacent to the Lindis River. The view from the summit is one of the most extensive in Central Otago with a vista including the St Bathans Range, Dunstan Mountains, Chain Hills, Dunstan Range, Kakanuis, McKerrow Range, Crown Range, Peaks of the Shotover, Pisa Range, Nevis Mountains, Remarkables, and numerous peaks of the Main Divide from the headwaters of the Hopkins valley (including Mount Huxley) in the north to Mount Aspiring in the south. From Lindis Peak there is potential to embark on substantial mountain bike, horse or 4WD journeys through Lindis Peaks, Deep Creek Long Gully and Sandy Point Stations to the Clutha catchment (such a journey would require runholder permission from all these properties). The crest of the Lindis Peak Range could also be gained from a track which heads westwards from Goodger Flat - the lower portion of which is a legal road.

The Lindis River margins receive substantial public use for picnicking and fishing. At least two areas are frequently used by campers with lessees permission. These are: an area on Geordie Hills Pastoral lease adjacent to the Lindis river, and a small area of freehold land adjacent to Nine Mile pastoral lease at the site of the old Lindis hotel. With the exception of Geordie Hills pastoral lease, access to the Lindis River is generally gained through legal roads, marginal strip or Crown land.

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9 MANAGEMENT CONSIDERATIONS

9(a) Wild Animals/Pests

Rabbits are the primary pest on all properties. With the exception of Shirlmar all properties were considered to have a rabbit problem serious enough to warrant their inclusion in the government sponsored Rabbit and Land Management Program. Breakdowns for rabbit proneness area as follows:

Longacre - 1205 ha high, 1740 ha moderate, 395 low.
 Merivale - 880 High, 1787 Moderate.
 Timburn - 2420 high, 2290 moderate, 422 ha low.
 Shirlmar - front country moderate, higher backcountry -low
 Geordie Hills - most of property moderately or highly rabbit prone
 Nine Mile - 409 high, 1811 moderate, 15 ha low.

Other pests include goats, hares and possums. Deer have historically been present in high numbers in Dunstan Creek but are now uncommon. Recent helicopter hunting has further reduced numbers.

9(b) Plant Pests

Rosa rubiginosa (briar) and *Hieracium* (Hawkweed) are the most severe weed threat on all properties. Species of *Hieracium* present include *H.pilosella* (mouse eared hawkweed), *H.lepidulum* (tussock hawkweed) and *H.praealtum* (king devil hawkweed). Other weed species present include *Hypericum perforatum* (St Johns wort), *Cardus nutans* (Nodding thistle), *Marrubium vulgare* (horehound) and *Conium maculatum* (hemlock).

Discaria toumatou and *Olearia* are considered a weed from a farming perspective but not so in terms of nature conservation.

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9(c) Fire

Summer fire risk is moderate over much of the properties. However risk of fire spread is somewhat reduced by large areas of irrigated pasture and depleted sunny faces which are not particularly fire prone. Remaining tussock grasslands on the Chain Hills are periodically highly fire prone. The Central Otago District Council is the rural fire authority over most of the area. DOC is the rural fire authority for the 1km fire safety margin surrounding Crown Land adjacent to the Lindis River. This land qualifies as a 'State Area' under the Forest and Rural Fires Act 1977.

PART 3: CONSULTATION

An early warning meeting was held with NGOs at Knight Frank in Alexandra on Thursday February 11. Key issues raised on each property were:

Geordie Hills: Access through to Chain Hills required. Landscape protection is recommended for the Lindis Pass scenic corridor. Short walks from SH8 desirable. Effectiveness of marginal strips on Lindis needs investigation in order to protect riverside recreational opportunities.

Longacre: Access through to Dunstan Creek important (vehicle access in Pleasant Valley). Recreational interest centres on Chain Hills. Suggest that access over Chain Hills for foot and mountain bike use should be established. Effectiveness of marginal strips on Lindis needs investigation in order to protect riverside recreational opportunities. Landscape values in Dunstan Creek are seen as important, and should be protected against inappropriate development (special lease or covenant). Landscape protection is recommended for the Lindis Pass scenic corridor.

Shirlmar: Public vehicle access to the base of the Chain Hills seen as being important. Public foot, mountain bike and horse access is mooted beyond the western base of the hills. The pylon route is seen as being important for horse trekkers and mountain bikers. Landscape values in Dunstan Creek are seen as being important and should be protected against inappropriate development (special lease or covenant). Landscape protection is recommended for the Lindis Pass scenic corridor.

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Merivale: Access through Merivale to Dunstan Creek is also seen as being important. Suggest that the pylon route stands to be important for recreationists. Landscape protection is recommended for the Lindis Pass scenic corridor. Effectiveness of marginal strips on Lindis needs investigation in order to protect riverside recreational opportunities.

Timburn: Various recreational opportunities are outlined including: horse, mountain bike or vehicle access to the top of Mount Misery, access to the Dunstan Creek via Dunstan Pass and access along McPhies Ridge. Suggested that access should be provided to the North Dunstan Mountains via the Richmond Valley. Effectiveness of marginal strips on Lindis needs investigation in order to protect riverside recreational opportunities. Landscape values in Dunstan Creek are seen as being important and should be protected against inappropriate development (special lease or covenant). Landscape protection is recommended for the Lindis Pass scenic corridor.

Nine Mile: Suggest foot and mountain bike access to the summit of Lindis Peak is a priority. Suggest public access up Camp Creek should be retained so as to maintain opportunities during future tenure reviews to negotiate public access routes through to Lake Hawea and north to the Timaru Creek/Longslip area. Suggestion made by one group that the summit of Lindis Peak is worthy of protection in conjunction with a rocky area which is reverting to scrub which extends down the North face of the property to Camp Creek. Effectiveness of marginal strips on Lindis needs investigation in order to protect riverside recreational opportunities. Historical interest surrounding the old Lindis Hotel is noted. It is also noted that this is a popular camping area.

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PART V: ATTACHMENTS

Illustrative Maps

Map 1	-	Topographic map with cadastral information overlaid
Map 1A	-	Cadastral Map
Map 2	-	Ecological, Landscape and Recreational Values
Map 2A	-	Historic Sites
Map 3	-	Recommendations

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