

Crown Pastoral Land Review of Other Crown Land

Lease name :

MT IDA SYNDICATE

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.

They are released under the Official information Act 1982.

June 04

**DOC CONSERVATION RESOURCES REPORT
ON MT IDA SYNDICATE PASTORAL
OCCUPATION LICENCE**

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PART 1

1.1 INTRODUCTION

The Commissioner of Crown Lands has commenced a review prior to expiry of the Mt Ida Syndicate Pastoral Occupation licence. As part of the review process, DOC is required to provide the Commissioner with an assessment of the conservation resources of the licence with recommendations on future use and ownership for the land.

The property comprises 8401 ha and is located on the Hawkdun Plateau, between Clear Stream and the Otematata River, east of the Hawkdun Range and north of the Ida Range. It is very remote, but has formed legal access. It lies in the centre of the Hawkdun Ecological District, an area of transition between Central Otago and Canterbury. This transitional factor is reflected in the geological and biological characteristics of the district and the POL. Bioclimatic zones vary from montane to low alpine.

The licence is held by a syndicate of Maniototo Plain farmers who traditionally (for over 100 years) have relied on this area for summer grazing of the extensive unimproved tall tussocklands.

A Protected Natural Area Programme survey of the Hawkdun Ecological District was undertaken in the summer of 1991/92 and a 1250 ha RAP (Hawk 10, Plateau) was identified to represent the plateau landforms and vegetation characteristics.

The licence adjoins large DOC landholdings on the Ida Range, and on other boundaries adjoins several pastoral leases under review and the Soldiers Syndicate POL, which is also under review.

The attached report has been compiled following the main DOC field inspection which occurred on 23-25 February 1998. A further inspection to assess herpetofaunal values was undertaken in 19-21 March 2001. These values were not able to be accurately assessed during the original inspection due to unsuitable weather conditions prevailing at that time.

Results from an aquatic fauna survey undertaken by DOC staff during 13-14 April 1999 are also included.

PART 2

INHERENT VALUES : DESCRIPTION OF CONSERVATION RESOURCES AND ASSESSMENT OF SIGNIFICANCE

2.1 LANDSCAPE

INTRODUCTION

The high country of the South Island is the result of an interplay of natural and cultural processes that has fashioned a continuum of landscapes from the completely indigenous through to those derived from human activity.

The South Island high country is dynamic - where the landscape is ever changing through both natural influences and human intervention. These are important considerations when determining management for the high country, as allowances have to be made for the physical environment to expand and evolve naturally.

At the end of 1996 the Department of Conservation adopted the policy that it would solely concentrate on areas on pastoral leases with "high inherent values", with landscapes and landforms being stated specifically as natural resources to be protected. At the same time, DOC adopted the following definition for the assessment of landscapes on pastoral leases which states:

- Areas which alone or collectively protect and sustain the significant natural character and integrity of the high country landscape.

Areas which maintain and enhance the most culturally valued attributes (e.g. Maori, scenic, aesthetic, recreational and historic) and their context within a natural high country landscape.

In the Hawkdun/Ida Ranges the same landscape values that are present on pastoral leases are contained within the Mt Ida Syndicate, therefore the same definitions should be applied to this POL.

METHODOLOGY

Initially the POL was divided into several discrete landscape units, with the boundaries being defined by changes in landform, vegetative cover, or the general direction of the drainage pattern. After the landscape units had been established the following criteria were applied to each unit to help determine the area's distinctive inherent characteristics. Furthermore, additional criteria were applied that helped to evaluate the previously stated two definitions for assessing high country landscapes, namely:

Intactness The condition of the natural vegetation and the degree of modifications to natural processes. In a landscape context intactness can be looked upon within a continuum of areas being pristine to being heavily modified.

Coherence The level of harmony which is visually evident between natural elements.

Another consideration necessary to assess is how vulnerable each of the landscape units is to further land-use changes and human activities. In the high country most threats to the existing character would come from further farming intensification leading to additional fencelines/firebreaks, spread of weed species, and traditional farming practices such as controlled burn-offs.

In some situations the landscape is robust enough to absorb a degree of further change without having an adverse effect on the overall natural character of the high country, while in more fragile and visually sensitive areas minor changes can have a detrimental and irreversible effect.

PHYSICAL CONTEXT

The Mt Ida Syndicate's POL is located within the heart of the Hawkdun-Mt Ida Ranges which form a substantial part of the backbone of the Central Otago high country. For this assessment these lands can be subdivided into four generic landscape types that help to place the POL into its broader physical context. These landscape types are:

- **Mountainlands**, which are located at the southern apex of the Ida Range as well as the St Marys Range further to the east. These high mountainlands form a highly visible setting for the POL. Their physical characteristics, in particular their peaks, angular shaped ridges, exposed scree faces and narrow dissected valleys contrast sharply with the typical block mountain landforms more commonly found in Otago.
- **Upland plateau**, a large percentage of the POL consists of a tilted upland plateau, sometimes known as a "mesa". This landform, which is very distinctive due to the lack of any physical relief, is surrounded by the headwaters of a number of tributaries of the Otematata River. Block mountain crests in Otago all feature rolling terrain rather than plateau landforms.
- **Dissected steeplands**, the main physical features of this landscape type, which wraps around the upland plateau, are the deep rough gorges that are characterised by steep slopes, rocky outcrops, screes, and shrublands at a lower level.
- **Escarpment**, this landscape type is solely located along the western boundary of the POL, a special feature being the exposure of the underlying geology of the blue greywacke, forming boulder fields. The broad altitudinal sequence contained within this landscape type is reflected in the ground cover pattern.

These landscape types (except for the mountainlands which occur outside of the POL) have been translated into geographically specific areas or landscape units.

Landscape Unit 1.

This landscape unit encompasses all of the tilted high plateau (mesa) which makes up a large proportion of the POL. The highest point is located along the western crest at an altitude of 1575 m then descends evenly to about 1270 m. in the east, where it drops sharply into the steep gorge containing the Otematata River. Across this vast tableland the minor variations in physical relief include snow banks and bogs that frequently form the origin of the youthful drainage pattern that disperses water off the plateau.

The predominant vegetation is a continual sward of slim snow tussock (*Chionochloa macra*) which grades in to narrow-leaved snow tussock (*C. rigida*) on the drier eastern faces. Over much of the plateau, the intertussock species are fairly limited due to the density of the tussock cover.

An important measure in assessing the quality of landscape values, in a high country context, is the degree of coherence between individual landscape components. On the upland plateau the existing tussock cover is very uniform, this homogenous characteristic has probably been helped by certain management techniques having been applied, including the wide distribution of salt lick blocks to spread grazing effects and erecting track barriers which help to prevent sheep from "coming home". The overall intactness of the tussock cover is one of the most outstanding landscape features of the POL.

Human impacts are confined to typical and traditional elements associated with management of the high country which include mustering huts and a network of access tracks. In most cases, these cultural elements do not have a high visual impact as the huts are located in depressions,

e.g. Inders Castle, and the tracks follow the natural contours. The lack of modifications and very few "built" elements give this unit high remoteness qualities.

The unit's spaciousness and lack of physical relief means that panoramic views are obtainable from most parts of the plateau which includes a distant view of Aoraki.

In visual terms, the distinctive horizontal terrain of the plateau contrasts sharply with the more angulated surrounding landforms, particularly the distant mountainlands, while the continual golden sheen of the snow tussock contrasts markedly with the tawny colours of the drier tussocklands.

This unit's subtle landscape qualities, due to its unvarying vegetative pattern, and highly visible landform makes it particularly vulnerable to any changes in land-use. The main threats to the existing landscape values include any subdivisional fences which would reduce the existing coherent nature of the tussock cover, as well as the remoteness qualities. The opening-up of the tussock cover on the drier eastern edges would allow further infestation of hawkweed into the naturally sparser tussock cover. The edges of the fragile bog areas are showing signs of stock concentration which could have a long term adverse effect on the plant composition and naturalness of these inherently wet areas.

Landscape Unit 2.

This unit includes all the dissected steplands that surround the upland plateau. The basic landscape type contained within this unit is fairly representative of much of the Hawkdun/Ida rangelands. In physical terms, the dominating features of the unit are the steep sided gullies that in some places make deep incisions into the surface of the plateau, notably Rambling Gorge which is one of the main tributaries of the Otematata River. The steep faces are characterised by rocky outcrops and stable scree with the main vegetative cover at highest altitudes being narrow-leaved snow tussock interspersed with both fescue and blue tussock. Over the lower slopes, particularly along the riparian margins, *Olearia*-matagouri shrublands are widely distributed. Patches of exotic grasses, particularly browntop, are concentrated around stock camps. The rugged and inhospitable natural character of the unit has meant modifications are relatively minor. This is probably due to several factors including the streams forming natural barriers and the steepness of the terrain. The main changes to the native plant community have been caused by the invasion of hawkweed on the higher drier slopes. Human impacts are minimal and are confined to access tracking that lead to the upland plateau.

Landscape Unit 3

This landscape unit solely comprises the escarpment located on the western flanks of the POL and extends from the crest of the plateau (1575 m) down to Clear Stream (1020 m). These constant graded slopes contain a variation of ground covers with alpine cushion plants inhabiting the upper crest while the slim snow tussock grades in at about the 1300 m. contour; above this level a distinctive feature is the vast boulder field comprising shattered greywacke. In visual terms a distinctive feature of the unit is the textural contrast formed between the tawny tussock cover and the blue grey colourations of the boulder fields. The unit conveys a high degree of intactness with little modification being apparent to the natural vegetative cover. It also contains a high degree of coherence with all the landscape elements being well integrated to form a highly recognisable and vivid landscape. The tussocklands would be vulnerable to further subdivisional fencing which would split the existing uniform vegetation pattern, while similar to other tussock grasslands tracking or 'dozed' fencelines would be difficult to conceal or be absorbed. As in LU 2., this unit helps to physically define the Mt Ida plateau.

SIGNIFICANCE OF THE LANDSCAPE

The Mt Ida Syndicate POL, which is located in the core of the Hawkdun/Ida Ranges, conveys an overall strong impression of being natural in character.

Although this POL is predominately natural in character overall, LU 1. has the greatest significance in landscape terms, mainly through its particular combination of intact tussock cover and the horizontal landform. These combine to form a memorable and vivid Otago high country landscape, which is not repeated elsewhere.

In essence the whole of this POL makes a distinctive contribution to the natural character of the South Island high country.

2.2 LANDFORMS AND GEOLOGY

The basement rocks of the Hawkdun Ecological District are mainly comprised of greywacke and argillite of the Alpine Assemblage of the New Zealand Geosyncline. However metamorphic textural zones, reflecting secondary or overprinted lithologic characteristics, are the most practicable mapping units (Bishop 1976). This episode of rock metamorphosis occurred during the folding and faulting of the Rangitata Orogeny (late Jurassic - early Cretaceous) with the degree of metamorphosis determining the nature of the resulting rock. In his 1:63,360 geological map of Mt Ida, Bishop (1976) recognised five metamorphic textural zones which grade into one another. The main Hawkdun and Ida Ranges are non-foliated thick-bedded greywacke (zone I), with increasing metamorphism (zones IIa, IIb, IIIa and IIIb), from moderately foliated greywacke to strongly foliated schist, further east towards the St Marys Range. On larger scale geological maps the Hawkdun E.D. is mapped as about 60% greywacke in the west, while Bishop's remaining four textural zones are classed together as semi-schistose rocks of the Haast Schist Group. Small areas of Tertiary and Quaternary sediments are found on the alluvial aprons on the south, west and northeast margins of the District (New Zealand Geological Survey, 1972).

Following the uplift of the Rangitata Orogeny there was a long period of erosion and relative tectonic stability beginning in the late Cretaceous which resulted in the eventual formation of a peneplain. Disruption of the late Cretaceous-early Tertiary peneplain commenced during the Kaikoura Orogeny when the fault-block mountains of Central Otago started to rise. This process resulted in the formation of distinct physiographic provinces in the Otago Region, each containing a segment of the former peneplain. East of the Hawkdun Ecological District, the St Marys Range rises from the lowlands of the Waitaki Valley. South-west of the St Marys Range the headwaters of the Otematata River are entrenched in a well-preserved peneplain remnant, the Hawkdun Plateau. In the west and south the dissected tectonic scarps of the Hawkdun and Ida Ranges separate the Hawkdun Plateau from the Manuherikia River valley and the Maniototo Basin, where the peneplain surface is now buried beneath Tertiary and Quaternary sediments. Further north, the scarp face of the Ewe Range rises above the Omarama basin. In the east, the Hawkdun Plateau rises to Mt Kyeburn and St Marys Range, which are separated by the Dansey Pass Fault from the northern edge of the Kakanui Mountains. These late Cretaceous to Eocene-aged surfaces of which the Hawkdun Plateau is part are the oldest peneplain remnants in New Zealand. The Hawkdun Plateau is a particularly well preserved remnant.

The Pleistocene glaciations have produced a series of small cirques on the north-eastern slopes in the lee of the crest of the highest part of the Hawkdun Range. These cirques are the most easterly glacial features in Otago. Patterned ground covers the spur and ridge crests of the Hawkdun Plateau above c.1450m, a characteristic feature of periglacial conditions.

The Hawkdun Ecological District is drained by tributaries of three main river systems. The Ida Burn and other tributaries of the Manuherikia River flow to the Clutha River; the Ewe Burn and tributaries of the Kyeburn join the Taieri River; and the Otematata, Otamatapaio and Omarama Rivers flow into the Waitaki River.

Extensive scree slides are a feature of the mountain scarps of the Hawkdun and Ida Ranges and the entrenched stream gullies in the greywacke portion of the Hawkdun Plateau. At one time these greywacke scree and areas of bare ground were thought to be an artefact of anthropogenic (man induced) erosion. However, it is now considered that they are the product of long established high rates of natural erosion with an added, but relatively minor, component of anthropogenic erosion over the last 1000 years (McSaveney and Whitehouse, 1989).

The Hawkdun Ecological District (and Waitaki Ecological Region) is transitional between the mountain ranges of Canterbury and Central Otago, both in terms of physical location, and geology and landforms. Much of the District is on greywacke terrain, with the steep scree slopes being characteristic of the Canterbury mountains. However the District owes its origins to the same processes which formed the Central Otago ranges: block-fault uplifting of an ancient peneplain. This geological history is revealed by the extensive flat-topped spur and ridge crests of the Hawkdun Plateau.

LAND SYSTEMS

Dr A E Hewitt (DSIR) in a soil reconnaissance of the Hawkdun Ecological District (1992) recognised the following Land Systems on the POL.

- Greywacke plateau - patterned ground
- Greywacke plateau - podzols dominant
- Greywacke plateau - brown soils dominant
- Steeplands - brown soils dominant
- Steeplands - Pallic soils dominant.

The Greywacke Plateau Land System comprises the planar ridge and spur crests of the Hawkdun Range and part of the Ida Range, and is a remnant of the uplifted peneplain. Above c. 1450 m patterned ground covers the Greywacke Plateau. Below this altitude podzols are present on the poorly drained areas with brown soils on the remainder of the land system.

The entrenched gullies of the Otematata River and its tributaries have dissected both the schist and greywacke terranes of the Hawkdun Plateau forming the steeplands land system. Altitude and aspect within this land system determine the distribution of the Brown and Pallic soils, with the latter found on slopes of sunny aspect below c. 1100 m.

SIGNIFICANCE OF THE LANDFORM

The POL landforms represent a transition from the origin of the processes that shaped the schist based block mountains of Central Otago to the greywacke terrain with scree slides typical of Canterbury.

Significant landform features include the ancient peneplain remnant on the Hawkdun Plateau which is a classic Central Otago geologic feature. It is a particularly well preserved remnant of this landform. The plateau comprises greywacke and argillite, typical of Canterbury. The planar landform dips gently eastwards and is surrounded by the deeply gorged watercourse of the Otematata River and its tributaries and Clear Stream.

The western escarpment is extensively covered in scree slides. These stable screes are another typical Canterbury landform feature.

2.3 CLIMATE

The Hawkdun Ecological District has no official climate stations within its boundaries. The closest stations are at Tara Hills (488m) just beyond the District's northern limits and Naseby (610m) just to the south of the District. Mean annual precipitation figures for a 30 year period (1951 - 1980) were 526mm at Tara Hills and 614mm at Naseby Forest (NZMS 1983). Within the District, mean annual precipitation increases with altitude and has been estimated to range from 500mm in the semi-arid northeast alluvial apron to 1600mm on the highest part of the Hawkdun Range (Waitaki Catchment Commission and Regional Water Board, 1982). A feature of the District's climate is a wide annual variation in rainfall. The montane valleys of the District have slightly higher precipitation in summer and lower in winter. At altitudes over 1000m much of the precipitation occurs as snow, which may fall at any time of the year. In the absence of any official climate records for the Hawkdun Ecological District, details of the climate, particularly in the alpine zones

must be inferred from studies of other South Island rain-shadow mountains in Central Otago (eg Mark and Bliss 1970) and Canterbury (eg McCracken 1980). Unlike the montane zone, the District's alpine zone has a pronounced winter maximum precipitation as snow, which forms an almost continuous cover for four to six months over winter. High winds cause the snow to be redistributed and accumulate on lee slopes, in cirques and other hollows where it may persist as snowbanks to late summer. Summer precipitation in the alpine zone is relatively low and evaporation rates can be quite high, but the total precipitation greatly exceeds estimated potential evapotranspiration and soil moisture remains at or close to field capacity throughout the summer growing season (Mark and Bliss 1970). By contrast, at lower altitudes in the subalpine and especially montane bioclimatic zones, summer droughts are common.

In the high-alpine zone daily freeze-thaw cycles probably occur on approximately half the days in the year with c.30% of days remaining below freezing and c.20% of days being frost-free. The longest frost-free period over five years in the high-alpine zone on the top of the Old Man Range varied from only 8 to 13 days (Mark and Bliss, 1970) and it is likely that similar conditions prevail on the Hawkdun Range. Freeze-thaw cycles on bare, moist alpine soils are often associated with frost lifting which promotes erosion and makes seedling establishment exceptionally difficult. In the montane valleys, frosts are severe from May until late August (Chapman 1985).

Snow cover is an important ecological factor as under snow soil temperatures do not usually drop far below freezing (Mark and Bliss, 1970). Fog and low cloud are not uncommon in the District but summer days are frequently warm and sunny. Wind is also an important ecological factor and is fairly strong and persistent with little seasonal variation. Wind directions over the District are predominantly south-westerly in winter and west-north-westerly at other times. Mean annual wind speed measured over two years at 1.25m above ground level at 1600m on the summit plateau of the Old Man Range was 5.67 m/s and decreased markedly with drop in altitude (Mark and Bliss 1970). On the nearby Rock and Pillar Range summit plateau (1390m) at a height of 2m, mean wind speed over a six year period was 7.88 m/s, again with little seasonal variation (Bliss and Mark 1974). It is likely that these values (which are very high by world standards) are similar to those of the Hawkdun Range summit plateau.

2.4 VEGETATION

Introduction

A survey of the botanical values of the POL was completed during 23 - 25 February 1998. Two distinct land systems were identified; namely a high plateau with gentle relief, and steep hillslopes associated with the plateau scarps and river gorges.

2.4.1 High Plateau

A well preserved greywacke peneplain remnant drained by the headwaters of the Otamatata River forms the core of the licence area. Ranging in altitude from 1575 m to approximately 1300 m, it has gentle eastward dipping slopes. The gradient affects vegetation patterns with bogs and bog-tussockland occurring on flat areas and tussockland on other, drier slopes.

(a) High alpine cushion and fell field

The gently rounded ridge crest at highest altitudes is largely bare of vegetation and is mostly comprised of lichen encrusted rock. Cushion plants present are dominated by *Dracophyllum muscoides* but *Hebe epacridea*, *Kelleria villosa* and *Pimelea* spp are common.

(b) Low alpine *Chionochloa macra* tussockland

This community is extensive and remarkable for its uniformity and the almost complete lack of tall shrubs. *Chionochloa macra* is the dominant species but other grasses, especially *Festuca matthewsii*, *Poa colensoi*, *Rhytidosperra pumilum* and *Deyeuxia aucklandica* are also abundant. In moister areas *Schoenus pauciflorus* dominates.

A wide variety of herbs occur between and beneath the tussocks. These include *Raoulia subsericea*, *Brachyscome sinclairii*, *Ranunculus foliosus*, *Epilobium alsinoides*, *Anaphalioides bellidioides*, *Pratia angulata*, *Kelleria dieffenbachii* and *Celmisia gracilentia*.

Localised impacts of sheep are apparent especially on the upper altitude margin of this community where it borders fellfield. Individual tussocks have been browsed to ground level, faecal pellet loadings are high and pasture grasses/weeds are prevalent.

(c) Low alpine bog-tussockland

This community is scattered throughout the plateau and exhibits considerable variability depending on the degree of wetness and nutrient status. It is characterised by high species diversity. *Chionochloa macra* is still dominant but with an abundance of herbs, sedges and rushes, particularly *Schoenus pauciflorus* and the comb sedge *Oreobolus pectinatus*. Other common species include *Kelleria paludosa*, *Plantago novae-zelandiae*, *Ourisia caespitosa*, *Gnaphalium mackayi*, *Isolepis aucklandica*, and *Euphrasia zelandica*. Common prostrate shrubs include *Coprosma perpusilla*, *C. atropurpurea* and *Gaultheria parvula*.

(d) Low alpine bog

Oreobolus dominated bogs are dotted about the plateau and along margins of flushes and small streams. *Chionochloa macra x rubra* hybrids are occasionally found at these sites.

An ephemeral tarn (dry at time of inspection) has the aquatic grass *Alopecurus geniculatus* and a pillwort, *Ptilularia novae-zelandiae*. The tarn is surrounded by hummocks of *Sphagnum cristatum* and *Oreobolus pectinatus*.

Many *Oreobolus* bogs show signs of heavy use by sheep. Discarded comb sedge tufts lie on the surface of such areas and the native grass component is tightly cropped. Tussock margins are often heavily grazed with occasional dead tussocks evident. Wetter *Sphagnum* dominated bogs show pugging damage.

2.4.2 River gorges and plateau scarps

These features bound the entire licence area and intrude into the heart of the central plateau via the catchment of Rambling Gorge. The terrain is generally steep and well drained. Rock outcrops, talus slopes, and coarse screes are common.

(a) Sub-alpine *Chionochloa rigida* tussocklands

These extend from near the plateau rim down to or near the valley bottoms. *Chionochloa rigida* tussock cover is patchy and sometimes sparse. Other native grasses are present including silver tussock (*Poa cita*) and *Dichelachne crinita* but introduced pasture grasses and weeds are also a significant component of the vegetation. Shrubs, especially matagouri and *Olearia odorata*, are scattered throughout and often line the margins of scree slopes and talus accumulations. Distinctive bright green patches of the fern *Hypolepis millefolium* occur on many screes.

The hillslopes at the eastern end of the licence area, above the Otematata River, show evidence of particularly heavy use by sheep. The tussock cover is very sparse and *Hieracium pilosella* is abundant.

(b) Montane shrub - short tussocklands

A narrow belt of sometimes dense shrublands occurs on rocky terraces and riparian margins of the larger waterways. Frequently occurring species include matagouri, *Olearia odorata*, *Coprosma propinqua*, *Carmichaelia crassicaule*, *C. petriei*, *Meliclytus alpinus*, *Aristotelia fruticosa*, and *Muehlenbeckia complexa*. Additional species recorded only in Rambling Gorge are snow totara (*Podocarpus nivalis*), mountain toatoa (*Phyllocladus alpinus*), turpentine scrub (*Dracophyllum uniflorum*) and *Brachyglottis cassinioides*. Small alluvial terraces free of shrubs are dominated by hard tussock and, less commonly, silver tussock. The size of the trunks of the snow totara

indicate that some predate European settlement. Most plants were located on fire refuges and, evidence of burning existed. Some plants showed sign of heavy browsing by possums and sheep also.

Rock bluffs and gorges have their own distinctive shrub and herb flora. The most conspicuous element is the shrub daisy *Helicbrysum intermedium* but other commonly encountered species include *Anisotome caudicola*, *Hebe buchananii*, *Cardamine* sp and *Celmisia* spp.

The shrublands are generally sufficiently dense or inaccessible to repel sheep. Accessible grasslands in this zone however are heavily grazed. The hawkweed *Hieracium lepidulum* has established in many talus fields.

Problem Plants

Hieracium pilosella is prevalent on hillslopes above the Otematata River and may be expanding into the scattered tussockland and rough pasture grassland. *H. lepidulum* occupies mainly talus fields at low altitudes. These invasive species are likely to remain a component of the montane vegetation as it trends towards a shrub dominant community, but are not expected to pose a threat to conservation values.

A couple of wilding pines were observed near Tailings Hut and one other on adjoining land in the northwest corner of the licence area on Long Spur.

Small localised stock concentrations have created areas of rough pasture within the extensive tall tussocklands elsewhere on the property.

SIGNIFICANCE OF THE VEGETATION

The entire area is an excellent example of a penepain remnant representative of the Hawkdun Ecological District. This has been recognised in part by the inclusion of the central core as a Recommended Area for Protection (RAP 10) in the Hawkdun Ecological District Survey Report for the Protected Natural Areas Programme (Grove 1994).

The extent and relative intactness of the *Cbionochloa macra* dominated communities and high species diversity of the bog communities, combine to produce an area of outstanding natural value. *C. macra* dominated communities of this extent are now extremely rare.

The surrounding plateau scarps and river gorges however add considerable habitat diversity at lower elevations and, together with the RAP, constitute a large and well defined conservation resource.

Vegetation sequences reflect the range in altitude from 700 metres at the Otematata River valley to the range crest at 1575 metres. Vegetation includes montane shrublands, short tussocklands, narrow-leaved tussocklands, alpine bog, slim snow tussocklands, alpine cushion and fellfield. The area as a whole has a high degree of representativeness and naturalness, with good long-term viability.

The impact of grazing overall has been low but localised heavy stock concentrations have had a significant detrimental impact on three areas. These are the margins of the fell field and *Cbionochloa macra* grassland at highest altitude, *Oreobolus* bogs and their immediate tussock margins, and the eastern hill slopes above the Otematata River. Further grazing at current levels will exacerbate problems at these sites and, over time, contribute to incremental degradation at other sites.

2.5 FAUNA

2.5.1 Invertebrate Fauna

Introduction

The Mount Ida Pastoral Occupation licence was inspected during 23-25 February 1998. During this time weather conditions were cool and rain and snow were experienced. Published information (Patrick 1994) along with results from the survey are reported here.

High plateau

The plateau spans almost half the property (~4000 ha) and ranges from 1300 - 1575 m. It is only lightly dissected by wet flushes and streams but steep scarps and slopes define the perimeter, and Rambling Gorge intrudes into the eastern part. This large area is dominated by slim snow tussock (*Chionochloa macra*). The tussocks, leaf litter and a rich array of herbs provide for a rich invertebrate fauna. This includes woolly bear *Metacrias erichrysa* larvae and tussock butterflies *Argyrophenga antipodum* and *A. janitae*. A range of day active moths depend on the herbs present. These include *Asaphodes nebbelias* and *Paranotoreas brephosata*. Dominance of grasses is reflected in the seven species of moth in the family Crambidae (grass feeders) noted. The moth *Epichorista demiana* caught here is a new record for the Range. Wetlands cover a small proportion of the area and provide for Hepialid moths feeding on comb sedge *Oreobolus pectinatus* and *Sphagnum* spp. moss. Other species include the large darning needle dragonfly *Uropetala chiltoni*. Pounded water contains the backswimmer *Sigara* species and large Dytiscid water beetle. Streams were also completely dry or very low during the survey. The large natural tarn appears to completely dry up in some years. Its floral and faunal assemblage will correspondingly contain species characterised by good dispersal or dormancy ability. The ephemeral tarn has been noted (Grove 1994) as a unique feature in the Range.

Alpine rock outcrop, rock pavement and rock scarp (> 1000 m)

These areas add significantly to the diversity of invertebrate habitat. Larger invertebrates shelter among the stones using an array of prostrate shrubs, cushion plants and tussock with its admixture of herbs available to them. These include; weevils (*Anagotis latirostris* and *Lyperobius* n.sp.), weta (*Hemideina maori* and *Deinacrida connectens*), grasshoppers (*Brachaspis nivalis* and *Sigauss australis*) and spiders.

The suite of invertebrates indicate high natural character and integrity for the Plateau communities.

Rambling Gorge and Boundary Creek

Sparse tussock cover and rock mantles sunny slopes and a variety of insects use reflected heat in such open sites. These include cicada *Maoricicada phaeroptera*, moths *Aponotoreas insignis*, *Asaphodes abrogata* and *Notoreas* n. sp. along with grasshoppers *Sigauss* species. The shrub *Helicrysum intermedium* is common on bluffs and, where sheltered and shaded, harbour dispersing flies, moths and the adults of aquatic insects. Lower down in the valleys (700 - 850 m) a complex of toe slope soils, rock and boulder banks meets terraces deeply incised by the streams. Basement rock is frequently exposed here. Despite this, stream gradients are surprisingly even. This diversity of habitats clothed with short tussock and shrublands yields an array of insects dependent on them. A stiletto fly *Anabarynchus* sp. and bug *Salda* sp. use sandy stream-side soils. An undescribed species of Lycaenid butterfly (*Muehlenbeckia* host) and moth *Declana junctilinea* are associated with rich shrublands. The cicada *Kikibia* sp., feeds on shrubs but basks in open areas. A new moth species *Kiwaia* n. sp. was discovered here. Bugs *Rhyphodes spadix*, *R. celmisiae* and *Metagerra* sp. use specific shrub hosts. The range of aquatic insects noted plus the paucity of algae on the stream bed at low flow, suggest low nutrient streams of high natural character. *Nesameletus* sp. mayflies were common in the survey.

2.5.3 Avifauna

Bird species recorded during the inspection include the following:

Australasian harrier	Grey warbler
New Zealand falcon	Blackbird
Paradise duck	Yellowhammer
Skylark	Chaffinch
Pipit	Australian magpie

This list is considered to be incomplete due to adverse weather conditions prevailing during much of the inspection. Other species recorded in the PNAP survey report and the Atlas of Bird Distribution in New Zealand (Bull *et al* 1985) and expected to occur on the POL would include the following:

South Island pied oystercatcher	Black shag
Banded dotterel	California quail
Pied stilt	Chukor
Grey warbler	Feral pigeon
Fantail	New Zealand kingfisher
Starling	Greenfinch
Hedge sparrow	Goldfinch
Silvereye	Redpoll
House sparrow	New Zealand Falcon

The New Zealand falcon is a Category B threatened species (Molloy and Davis 1994).

2.5.4 Herpetofauna

Three surveys have been carried out on Mt Ida Syndicate, the first in March 1985 (Whitaker, 1985), the second 23-25th February 1998 (Loh, unpublished report), and the most recent 19-21st March 2001. In addition, a survey of part of Blue Duck Creek on an adjoining property to the south west of Mt Ida Syndicate (a property under DoC management) was carried out in March 2000 by Mike Tubbs *et al.* (unpublished field notes).

1. Whitaker's 1985 survey

Whitaker's (1985) survey only touched on Mt Ida Syndicate POL, but the survey covered the entire land area surrounding the property - to Otematata in the north, Naseby in the south, the St Marys Range in the east and Hawkdun Range in the west.

Whitaker (1985) found five species of lizard in and around POL: scree skinks *Oligosoma waimatense*, cryptic skinks *O. inconspicuum*, common skinks *O. nigriplantare polychroma*, McCann's skinks *O. maccanni*, and common geckos *Hoplodactylus* aff. *maculatus*. *Oligosoma waimatense* is a Category B threatened species (Molloy and Davis 1994), and *O. inconspicuum* although widely distributed, is only known from a handful of locations in Otago, presumably because of its habitat specificity (this species cannot tolerate arid conditions).

2. Loh's 1998 survey

Loh's 1998 survey was carried out in appalling weather conditions. As a consequence, very few lizard species were discovered. A single gecko slough was located, presumably from *Hoplodactylus* aff. *maculatus*, and several *O. n. polychroma* were sighted. Loh located what he considered to be appropriate *O. otagense* and/or *O. grande* habitat in Rambling Creek (H40 873 933, 906 923, 913 923, 892 921, and 906 914), although no sign was found. Potential scree skink (*O. waimatense*) habitat was located at three sites on the property:

The western slopes of the run, that drop into Clear Stream, particularly the northern three gullies.
Some gullies off Long Spur into Boundary Creek.
Some gullies in the south tributary of Rambling Creek.

3. Tubbs and McQueen's 2000 survey

In March 2000 a property to the south west of Mt Ida Syndicate was surveyed and scree skinks were discovered at four sites in Blue Duck Creek (871 841, 859 812, 872 829 and 866 828). These are the northernmost populations of scree skinks for the Hawkdun/Mt Ida area. The closest of these sites is only 5 km from the southern boundary of Mt Ida Syndicate.

4. Tocher, McQueen and Tubbs' 2001 survey

The most recent survey was carried out in fine and sunny weather over March 2001.

Only two lizard species were discovered during this search: *Hoplodactylus* aff. *maculatus* and *O. maccanni*. Densities of *O. maccanni* were exceptionally high (approx. 25 sighted in 1 hour).

Part of Boundary Creek was searched from the stock bridge to the area adjacent to the Tailings Hut (H40 909 911) on the afternoon of March 19th. Suitable habitat for scree skinks was located and searched (700-1000m), however no skinks or their sign was discovered.

Gullies in the northern tributary of Rambling Creek were searched on March 20th (906 930). Again, habitat suitable¹ for scree skinks was located and searched, but no scree skinks were found. A single *Hoplodactylus* aff. *maculatus* was found at 901 934. *O. maccanni* were common everywhere.

The final day of the survey was conducted in the far north west corner of the property. Here extensive scree slopes were searched (830 940 -830 960). Again, no scree skinks or their sign were discovered. In contrast many *O. maccanni* and their sign were noted.

Summary

Scree skinks *Oligosoma waimatense* are distributed over a wide geographic range from Marlborough through Canterbury and into North Otago. Scree skinks were once synonymous with Otago skinks, *Oligosoma otagense*, and a recent report from C.H. Daugherty from Victoria University has once again cast doubt on the species status of Otago *O. waimatense* populations.

Daugherty's report claims that *O. waimatense* from the Ida Range are in fact populations of *O. otagense*, a Category A threatened species (Molloy and Davis 1994). Should this claim be verified, the Ida Range skink populations represent a significant range extension for the endangered *O. otagense*. Conservation initiatives for *O. otagense* would need to be completely reviewed in light of this; populations in the Ida Range would become of immense importance and protection of their habitat a top priority. It is likely that the Ida Range populations would represent a distinct management unit from *O. otagense* populations at Macraes/Middlemarch and Lindis.

There is no sensible biological or geological reason to expect scree skinks not to reside on the Mt Ida Syndicate POL. It is highly likely that further searches in the headwaters of Boundary and Blue Duck Creek will yield more scree skink records.

Despite fine and sunny weather throughout the March 2001 search, *O. inconspicuum* and the green skink, *O. chloronoton* were not discovered on the POL. *O. inconspicuum* were found on

¹ Habitat located in the northern tributary of Rambling Creek resembled habitat occupied by scree skinks in Blue Duck Creek (Shirley McQueen and Mike Tubbs pers. comm. 2001). The habitat generally consisted of stable-semi stable rock tumbles.

the neighbouring Soldiers Syndicate by Whitaker (1985), and are no doubt also present on Mt Ida Syndicate POL – albeit in restricted sites. *O. chloronoton* were not found by Whitaker over the entire area searched, which included 18 properties (Whitaker 1985). However, *O. chloronoton* is commonly sighted at Falls Dam on the Manuherikia River, not far from Mt Ida Syndicate POL. Suitable habitat was certainly present for this species on POL and as with *O. inconspicuum* and *O. waimatense*, their absence cannot be readily explained.

2.5.5 Aquatic Fauna

The NIWA Freshwater Fisheries Database holds no records for this property. The closest records are for the Otematata River near Diggers Flat, for upland bully, rainbow and brown trout (map ref. H40 852 042).

Eight sites were surveyed during the inspection carried out during 13-14 April 1999, five inside the boundaries of the property and three just outside it (for reasons of ease of access). One species of native fish was recorded during the survey, the common river galaxias (*Galaxias vulgaris*). This fish was recorded just outside the property, in Guffies Creek near Tailings Hut (where it was common) and at the site in Boundary Creek (map ref. I40 918 925) where the 4WD track crosses the lower end of the creek (where it was uncommon). The only other fish species recorded were brown and rainbow trout, also at the site in Boundary Creek. All other sites fished had no fish present, despite apparently suitable habitat being available (in spite of drought conditions at the time). It is likely, given the steep nature of all streams in the area, that suitable access for fish from downstream reaches is not available.

Problem Animals

Pigs live in scrubby gullies, venturing out onto the tussock grasslands. A very low population of red deer persists. Possibly chamois and thar occasionally occur, drifting down from Canterbury. Recreational hunting provides adequate control.

Hares are found in moderate numbers throughout the area. Possums occur in shrublands. None of these animals are present at population levels of concern. Late in the 19th century, rabbits exploded to plague proportions but are currently at very low levels. Cat scats collected in Rambling Gorge were filled with skink scales and indicate high predator impacts.

SIGNIFICANCE OF THE FAUNA

Invertebrate values

With the uniform rock type and the extensive planer grasslands the POL contains a wide range of habitats for invertebrates. The species noted are representative of, or “define” the Hawkdun Ecological District (see Patrick 1994). Of note are the alpine species *Brachasptis nivalis*, *Lyperobius* sp. and *Epichorista demiana* (a new record) and the lower elevation species *Aponotoreas insignis* and *Kiwaia* n.sp.. The plateau grassland community is the most extensive in the region (possibly New Zealand) at this elevation (1300 - 1575 m). The shrublands, high rock scarps and ephemeral tarn are important habitats while the various grasslands and streams are representative of widespread communities in the Hawkdun Range. This area is biogeographically distinctive and important in the New Zealand context. It has its own suite of endemics such as the large speargrass weevil, an eastern South Island new species at its southern limit, Central Otago alpine species and widespread alpine species. The species recorded are representative of an intact indigenous ecosystem.

Vertebrate Values

A notable feature was the record of New Zealand falcon, a Category B threatened species.

The Mt Ida Syndicate POL adjoins land inhabited by the scree skink, *Oligosoma waimatense*, and suitable habitat for this Category B Threatened Species is abundant in the POL.

Whilst no scree skinks were discovered on the POL during the several lizard surveys undertaken to date, researchers have little doubt it occurs there. Recent research at Victoria University indicates that the Ida Range scree skink population is genetically distinct from other populations further north and further, it is more closely aligned to the Otago skink, *Oligosoma ottagense*.

If true, the Ida Range populations of scree skinks must be treated as a separate conservation management unit.

2.6 HISTORIC

Maori sites

No Maori sites have been recorded from the general area of the POL. However Bill Scott, one of the licensees, did mention the presence of a reputed oven on the flats by the stock bridge over Boundary Creek. Unfortunately this site could not be located during the survey.

European history

The European history of the Mt. Ida Syndicate POL started in August 1860 when Run 362 was added to the existing leases of John Borton and Alexander McMaster which comprised Kyeburn Station. Despite the extensive lands on the Maniototo side of the ranges the station was run from Maerewhenua in the Waitaki valley. Perhaps in response to the gold rushes of 1863 to Naseby, Kyeburn and Mt. Buster, the partners sold the bulk of the leases to William Sanders of Victoria in April 1866. At the same time the Lands Board reassessed the leases and Sanders got Run 211 unconditionally and a 17 year lease on Run 362. Sanders sold out to M. J. Scobie Mackenzie and others in 1875 for £36000 (Pinney 1981:92-93).

At this time Run 362 was divided, Run 362A (43,400 acres) remained part of Kyeburn Station and Run 362B (26,600 acres) was taken up by the Mt. Ida Pastoral and Investment Co. which also took up the Rugged Ridges, Eweburn and Eden Creek leases. However the next few years were not kind to the Mt. Ida Co. The country entered an extended period of economic depression and the rabbit plague advanced. When the pastoral leases were renegotiated in 1883 the company lost much of its low lying winter country and it declined to take Run 362B.

The following year the Mt. Ida Co. was replaced by the Naseby Pastoral Investment Co. The unwanted Run 362B was taken up in March 1884 by Walter Inder who was a major shareholder in both the Naseby and the Mt. Ida companies. He surrendered it in March 1885 and in March 1886 it was leased to the Naseby Co.

The Naseby Co. went into liquidation in 1895 and Run 362B was transferred to Peter Law, another former shareholder in both companies. Unfortunately Law's taking up the run and stocking it coincided with the worst snowfall for many years and most of his stock was lost. These losses were too much for Law to sustain and the lease was surrendered. In 1897 Run 362B was let to Charles John Inder (son of Walter) who was acting on behalf of a syndicate of farmers. This syndicate was to become known as the Mt. Ida Syndicate and they have retained Run 362B ever since (ibid.:150-151).

Recorded sites

Despite the presence of several areas of gold workings east of Guffies (or Tailings creek), between Mt. Buster and Hut creek, there were no indications of gold working or even prospecting along the terraces of Tailings creek. With one possible exception the sites described below are all associated with the Mt. Ida Syndicate's occupation of the land and date to the present century.

The exception is a simple stacked stone fireplace on a terrace on the true right of the Otematata river just upstream from the old stock bridge (140 915 922).

This may date to the grazing of the run before the current syndicate took it up, but it is also possible that it is associated with the early years of the syndicate, before huts were packed in, when musterers camped in canvas tents and cooked over open fires. There were no associated artefacts with which to determine an approximate date.

Approximately 200 metres downstream of the fireplace is the old stock bridge. This is a suspension bridge which was built in about 1933 (Bain 1997:46). It is now in a dilapidated condition with some of the decking missing and rot in the remaining timbers.

There were originally four huts on the licence; one at Tailings Creek which was built in 1924 and since extensively modified and three corrugated iron huts which were packed in 1934 (ibid.:28). All three are still standing although Boundary hut has been shifted to the site of “Inder’s Castle”. They are simple huts with earth floors, chimneys made from rolled sheets of corrugated iron, and two small four paned windows.

Perhaps the most interesting historic feature of the lease is the former Ida Valley railway station. In 1976 the railway station was transported in on the back of a trailer with a bulldozer at either end. It has replaced the old corrugated iron huts as the main accommodation on the licence. A similar railway station from Kokonga was shifted to the bottom of the Mt Buster road in 1986 (ibid.:29).

SIGNIFICANCE OF HISTORIC VALUES

All of the historic features associated with the Mt Ida POL are derived from the pastoral history of the area. Most, if not all, are associated with the operations of the current syndicate over the last hundred years. In regional or even local terms there is nothing here which is of sufficient significance to merit any further action, but these sites are of significance to the history of the Mt. Ida Syndicate. In particular it would be a pity if the remaining huts at the Wire Yards and Chimney Gully were to be removed or modified. With minimal maintenance, primarily drains around the outside and the replacement of any rotten timber in the framing, these huts should last for many years yet.

At some time in the future measured drawings of the Ida Valley railway station should be taken. While the Otago Central Railway has been preserved as a rail trail, most of the buildings associated with the many small stops have been removed and Inder’s Castle presents a good chance to make a permanent record of part of Otago’s rail heritage.

2.7 PUBLIC RECREATION

2.7.1 Physical Characteristics

The Hawkdun-Ida-St Marys Range form a substantial barrier of dissected mountainous land between Central Otago and South Canterbury. The mountains have many peaks over 1800 metres, and surround the heavily dissected alpine plateau which is drained by many creeks forming the Otematata and Otematapaio catchments to the north and the Manuherikia River and Kyeburn catchments to the south.

The Hawkduns perpendicular alignment to the prevailing south westerlies results in a lower snowline and more reliable snow cover than adjacent ranges. An absence of obvious developments such as fencelines during winter provides an experience of remoteness on a grand scale which is not always apparent on other Central Otago ranges. The Hawkduns are off the usual flight paths for light aircraft, which heightens feelings of remoteness. A good network of farm access tracks and some formed legal roads provide ready 4WD access in summer. The towns of Naseby and Ranfurly are adjacent to the area and are growing in importance as holiday centres.

There are four huts located on the property ie, the Wire Yards hut, Chimney Creek hut, Inders Castle and the Tailings hut down by Guffies Creek. All have some potential for recreational use.

2.7.2 Public Access

The most commonly used access route is via the Mt Buster Road, formed to 4WD standard. This road ends just within the southeast corner of the licence where it joins the marginal strip along the Otematata River. Two 4WD farm access tracks which approximate legal road alignments provide access to the northern boundary of the licence along Barneys Spur and the spur east of Chimney Creek on Otematata Pastoral Lease, providing access from Otematata.

All of these roads connect to a network of 4WD farm access tracks within the licence. The Mt Buster Road route involves crossings of the Otematata River and Boundary Creek to reach the plateau summit. Some of these crossings can be deep and risky if rivers are running high, due to rain or spring snow melt.

In 1972 a traffic bridge was built over the Otematata River by the licence holders with materials supplied by the Waitaki County Council. It was destroyed in the major flood of 1978. An old stock bridge exists upstream of the Boundary Creek ford but is in a dilapidated and unsafe condition.

A non-legal farm access track along Walking Spur and the crest of the Hawkdun Range provides access through Braeside Pastoral Lease and out to the upper Manuherikia Valley and Home Hills Runs Road. An alternative non-legal route back to Naseby exists via a loop track through Soldiers Syndicate POL via Long Spur to join up with the Mt Buster Road.

Marginal strip access exists up the Otematata River and Boundary Creek to the southeast boundary of the licence and along the Clear Stream tributary of the Otematata River to the northwest corner of the licence.

There are no other marginal strips, apart from the former, located within the licence.

2.7.3 Activities

Some limited recreational hunting for pigs and occasionally red deer occurs. The Otematata River has a good reputation as a brown trout fishery, especially in its lower and middle reaches. 4WD trips through from Naseby to Otematata are possible. Mountain biking, tramping and horse trekking are existing activities.

In winter the 50 km of the Hawkdun-Ida Range crest and central plateau offers considerable opportunity for extended cross country skiing, as well as shorter trips. With favourable snow, traverses to the Kakanui Mountains or the Lindis Pass are possible. The terrain is varied, from gentle crests and basins, to steep and very steep gullies and faces, and is highly valued for its remote experience qualities.

PART 3

OTHER RELEVANT MATTERS

3.1 Consultation

NGO comments were obtained at an early warning meeting held in Dunedin on 12 December 2000. Key points raised were:

- All of the POL contains sufficiently high conservation values to warrant transfer to DOC. It possesses high landscape/botanical values, has extensive *Chionochloa macra* tussocklands and contains a major RAP.
- The POL is excellent terrain for cross country skiing. It is considered to offer a remote experience for recreation especially in winter.

- Recreation groups are relaxed about ongoing grazing as long as public access is not restricted.
- Huts on the property are useful for recreationalists.
- The POL is seen as a key part of the proposed Oteake Conservation Park.
- If not all of the POL transfers to DOC, then public access along Long Spur will need to be provided for.

3.2 Regional Policy Statements and Plans

The land is zoned Rural Scenic in the proposed Waitaki District Plan. However there are effectively no provisions that protect the scenic values. Under the Canterbury Regional Land Plan (Vegetation Burning) any burning would be subject to performance standards relating to topdressing and spelling from grazing. The burning of wetland vegetation is not permitted.

3.3 DISTRICT PLANS (Matters of National Importance)

The licence area is located within the Rural Scenic Zone in the provisional Waitaki District Plan. The plan does not identify the RAP Hawk 10, Plateau within this zone. The only restrictions on land use relate to the clearance of bush which is a discretionary consent and a minimum limit of 20 ha on the size of new rural allotments.

There are no matters of national importance Section 6 of the Resource Management Act on the licence area shown in the provisional district plan.

3.4 CONSERVATION MANAGEMENT STRATEGIES AND PLANS (CMS and CMP)

3.4.1 Canterbury Conservancy CMS

The POL is located within the DOC Canterbury Conservancy. The Conservancy CMS provides comment on the natural and historic features of the Waitaki land unit. Mention is made of relevant conservation management issues, conservation objectives to protect areas of high natural, historic and recreational value and a set of implementation strategies to achieve these objectives.

An extract of the CMS, pp 99-112 is appended.

3.4.2 Otago Conservancy CMS

The Otago Conservancy administers large tracts of alpine land along the flanks and crest of the Hawkdun-Ida Ranges adjacent to the POL. The Hawkdun Plateau (ie, the POL) landscape, recreation, natural and historic features are referred to in the section covering the St Bathans-Hawkdun-Ida Special Place No. 17. An extract of the CMS Special Place No. 17, pp 278-283 is appended.

Both Conservancies CMS refer to the long term objective of creation of the Oteake Conservation Park, incorporating land managed by the department on the Hawkdun, Ida and St Marys Ranges.

3.4.3 New Zealand Biodiversity Strategy

The New Zealand Government is a signatory to 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 else is necessary to

Maintain and restore viable populations of all indigenous species and subspecies 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

4.1 ADDITIONAL INFORMATION

- 1 Photos of Areas of Conservation Interest on Mt Ida Syndicate Pastoral Occupation Licence.
- 2 Extract of Hawkdun Ecological District Survey Report for the Protected Natural Areas Programme pp 5:43-5:45.
- 3 Extract of Canterbury Conservancy Draft Conservation Management Strategy Waitaki Unit, pp 121-127 and page 130.
- 4 Extract of Otago Conservancy Conservation Management Strategy Special Place 17, St Bathans-Hawkdun-Ida, pp 278-283.
- 5 Bibliography

4.2 ILLUSTRATIVE MAPS

- Map 1 - Cadastral
- Map 2 - Values