

Crown Pastoral Land Tenure Review

Lease name :Ben Dhu Station

Lease number :PO 222

Conservation resources report

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

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

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DOC CONSERVATION RESOURCES REPORT ON TENURE REVIEW OF BENDHU PASTORAL LEASE

PART 1 INTRODUCTION

This report describes the conservation resources of Bendhu Station. The property is located in the upper Waitaki Basin, approximately 17 kilometres west of Omarama on the Quailburn Road. It consists of 3919 ha and extends eastwards from a subsidiary ridgeline of the Diadem Range and includes steep east facing mountain slopes and basin floor between the Diadem Range and the Cloud Hill range further east. The altitudinal range extends from around 500 metres to nearly 1500 metres. The adjacent pastoral properties are Quailburn Downs to the south-east, Ahuriri Downs to the south, Birdwood to the south-west, Ribbonwood to the north-west, and Glen Eyrie Downs to the north-east.

Bendhu is apportioned roughly equally between the Ahuriri and Omarama Ecological Districts, within the wider Mackenzie Ecological Region. The property was surveyed during the Mackenzie PNAP Survey, with two Recommended Areas for Protection being identified – East Diadem Range (RAP A9), and Bendhu Bog Pine (RAP O10). The only protected natural area within the property boundaries is Bendhu Scientific Reserve, which protects a "wilderness" community of bog pine (*Halocarpus bidwillii*) and mountain toatoa (*Phyllocladus alpinus*).

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

2.1 Landscape 2.1.1 Landscape context

Bendhu lies within a broad Waitaki Mackenzie range and basin landscape type. The property is separated from the main basin by a smaller range (Cloud Hill) to the east. In general the Waitaki Basin is characterised by wide, open spaces, big vistas, few trees, sparse settlement and mountain backdrops. On the adjoining property to the north (Ribbonwood), conifer shelterbelts and plantations have transformed the treeless landscape characteristics of the Mackenzie Basin.

Bendhu lies at the south end of the Waitaki-Mackenzie Basin, one of the most extensive outstanding natural landscapes in the Canterbury Region and "one of the most investigated, painted, written about, visited, eulogised and argued over landscapes in New Zealand" (Boffa Miskell Partners and Lucas Associates 1993¹). The sheer scale and openness of the Basin and the relatively natural character is unsurpassed in New Zealand. It is also a highly visible landscape, viewed from major tourist highways (SH8 and SH80) and the Tekapo Canal roads.

¹ Boffa Miskell and Lucas Associates – Canterbury Regional Landscape study, vol. 1 & 2

The Basin retains very high "natural" qualities because of its overwhelming dominance of natural landform and extensive presence of short grassland, and scattered shrublands which still retain a component of native species and continues to support a diversity of indigenous insects, lizards and birds.

2.1.2 Description

For this report the pastoral lease has divided into landscape units (LUs). For each unit, a landscape character description is given followed by a description of visual and scenic values. A summary evaluation is then presented using a range of criteria to assess each unit and assist with determining each unit's inherent values.

Landscape Units

The three landscape units identified on Bendhu were:

LU1	Diadem Faces
LU2	Basin Floor
LU2b	Bog Pine Sub Unit

1. Diadem Faces - Landscape Unit 1 (LU1)

Character Description

The front faces consist of east-facing dissected mountain slopes with distinctive spurs leading off the main ridge, and three main gully systems. Slopes are generally smooth colluvial slopes.

The top block in general has a greater level of intactness and there is a visual change in land cover apparent between the lower and top blocks, reflecting a higher level of land development below the fence. Land below approximately 1100 metres has been oversown and top-dressed (OSTD). Vegetative cover is scattered short tussock, briar, patchy matagouri and pasture grasses. Snow tussock persists on shady faces into the mid-slopes but is depleted on sunny faces. Approximately 50% is non-indigenous or bare ground.

Above 1100 metres snow tussock assumes the dominant cover but still with a high degree of bare ground and low stature. On upper slopes bog rush occupies moist sites in distinctive red streaks contrasting with tussock cover. On ridges, underlying basement rock is exposed in places and 'green' stock camps are common.

Visual & Scenic Values

The Diadem faces are typical of range landforms in the Waitaki Basin. They have no distinctive or memorable visual features; however they are significant in that they form part of the visual enclosure and backdrop to the Omarama Basin. From a distance they appear as a tussock covered range top. Access tracking is limited to two tracks that do not dominate or degrade visual values.

Table 1 LU1 Evaluation Summary

Criteria	Value	Comment
Intactness	Low Variable	Below top fence Above fence, tussock depleted but intact, considerable bare ground
Legibility	Medium	
Aesthetic Factors	Medium	Not distinctive-typical Mackenzie Range landform and landcover Depleted vegetation degrades aesthetic value
Historic Factors		None known
Visibility	High	Upper faces visible over wide area within Omarama Basin
Significance	Medium	Locally significant to Omarama Basin
Vulnerability	High	Vulnerable to further ecological deterioration with inappropriate management

2. Basin Floor - Landscape Unit 2 (LU2)

Character Description

The valley floor appears as one landscape unit and is part of a larger area that includes the valley floor between the Diadem Range and the smaller range separating it from the Omarama Basin. The unit while at first appearing quite similar has considerable variation in topography and vegetation patterns. Topographic variation includes fan formations at the base of the Diadem range, low terraces, alternating with depressions and poorly drained areas, alluvial flats and moraine. The moraine forms a low undulating central ridge that divides the flats in two. The northern flats are slightly higher than the area south of the central ridge. The airstrip is located on the moraine.

Landcover is variable and reflects differences in topography and soils. Overall, vegetation cover is highly modified but retains a significant indigenous component. It is dominated by depleted hard tussock, isolated tall tussock, matagouri, large areas of *Cassinia* shrubland, clover and browntop. *Hieracium* is also widespread. On better soils and poorly drained sites, pasture and clover have completely displaced indigenous cover. On drier well-drained sites, hieracium, matagouri, depleted short tussock and *Cassinia* shrubland occur over fairly large areas. A pine / douglas fir shelterbelt extends from the north boundary, southeast towards the bog pine area (LU2b). A dense belt of self seeded douglas fir occurs on the north boundary and is spreading into pasture and tall tussock grassland.

A wet area north of the moraine contains snow tussock and red tussock. The wetland is deer fenced and is fairly modified with patchy tussock and extensive exotic grasses. In the northeast, a large dry belt does not appear to have been OSTD and stands out against more exotic induced areas to the south. It consists of depleted tall tussock, *Hieracium* and *Cassinia* shrubland. The Quail Burn is enclosed by low terraces and alluvial flats on the east side of the lease adjacent to the station buildings. Vegetation there is highly modified. Conifer shelterbelts, smaller paddocks, exotic plantings are concentrated around the farm buildings and adjoining areas.

The openness is a key characteristic of the valley floor, away from the farm plantings. The valley floor has a wild, open, undeveloped character. The remaining *Cassinia* and matagouri shrublands and scattered short and tall tussock contribute to this character.

Visual & Scenic Values

The varied and interesting topography and vegetation patterns of the valley floor, together with the adjoining ranges contain significant visual and scenic values. The openness, landform, vegetation patterns and backcountry feel contribute to these values. The open valley floor and remaining indigenous vegetation provides a landscape context for the bog pine vegetation.

Table 2 LU2 Evaluation Summary

Criteria	Value	Comment
Intactness	Medium	Variable over valley floor
Legibility	High	Glacial processes legible and intact
Aesthetic Factors	High	Distinctive landscape and visually coherent
Historic Factors		None known
Visibility	Low	Except from Quail Burn Road
Significance	Medium	Local significance
Vulnerability	High	Vulnerable to tree spread and planting/loss of openness

2b. Bog Pine Sub Unit Landscape Unit 2b (LU2b)

Character Description

This sub unit encompasses two substantial stands of bog pine, within the valley floor unit. The bog pine and associated celery pine form relatively open savanna-type woodland islands. The distinctive olive/green colour of the woodland contrasts with the surrounding vegetation. A narrow strip of wetland remains between the two main stands. Outlying patches of bog pine occur around the two main stands.

Visual & Scenic Values

The bog pine has high visual values. The distinctive pattern, character and colour of the woodland is significant in terms of the landscape and contrasts with the open grassland character of the surrounding landscape.

Table 3 LU2b Evaluation Summary

Criteria	Value	Comment
Intactness	High	Bog pine intact. Surrounding tall tussock and wetland modified
Legibility	Medium	Wetland partly modified
Aesthetic Factors	High	Visually distinctive and memorable. High level of visual coherence
Historic Factors		None known
Visibility	Low	Visible from Quail Burn Road
Significance	High	Best example of bog pine in the region
Vulnerability	Medium	Vulnerable to ecological changes

2.2 Landforms & Geology

The Bendhu Pastoral Lease is located in the central Upper Waitaki Basin, a large structural depression or inter-montane basin. The depression has been partly in-filled by gravel's, firstly by piedmont gravel's coming off the hills formed around the basin and later by moraine and outwash associated with Pleistocene glaciers.

There are two main geographical features represented on Bendhu – the Diadem Range, a hard rock mountain range and secondly the basin floor moraines and gravels which make up most of the flatlands east of the hills.

The Diadem Range is a steep hill range rising from the Mackenzie Basin floor to rolling vegetated summits, up to 1490m asl on Bendhu. Composed of indurated greywacke and black argillite of the Torlesse Group (Chlorite Sub-Zone I), the hill has three main stream valleys dissecting its face, with secondary small gullies and spurs.

Hill slopes are generally steep to very steep and planar to broadly rounded in form, rising to a narrow, but relatively flat summit. Their surface is generally smooth with relatively few rock outcrops breaking the surface except on summit slopes. Overall the hill is well covered with vegetation and lacks the extensive scree typical of many Canterbury range

The flatlands are made up of deposits of glacial till and fluvio-glacial outwash, as well as alluvium derived from these deposits. These deposits are associated with a series of late Pleistocene ice advances and recessions that occurred during two main ice advances - Balmoral, and Mt John. Only moraine from the Balmoral formation is represented on Bendhu, but outwash surfaces are from both. Correlated with the glacial history is the formation of a series of fan and terrace surfaces – older fans and terraces can be correlated with the Balmoral Formation and intermediate fans and terraces with Mount John formations. Young terraces alongside the Quail Burn are of post-glacial age and their deposits either overlie glacial outwash or have cut into these deposits.

2.3 Climate

The Upper Waitaki Basin has a continental like climate with hot summers and cold winters annual, diurnal and extreme ranges in temperature. Lower winter temperatures and greater contrast between summer and winter temperatures are the main climatic features distinguishing this upland basin from lowland regions such as the Canterbury Plains.

According to climate records from the NZ Met Service, rainfall is normally evenly spread throughout the year, but there is a wide seasonal and annual variability from year to year. Bendhu has a moist sub humid climate (550-800mm of rainfall) on the flats similar to Ribbonwood, the property bounding Bendhu to the north, which averages 780mm annually at the homestead. Rainfall increases with altitude on Diadem Range with over 900 mm of rain on summit areas.

On average, snow falls on 6-12 days each year, the months May through to September having more than one day of snow per month. However, snow may fall during any month (NZ Met. Service, 1983), and there may be considerable variation from site to site and year to year in the patterns of snow accumulation (O'Connor 1976).

The basin enjoys high sunshine hours, averaging 2000-2300 per year (cf. Christchurch which averages 1950). There is no season which may be called frost free, and the months of April to November have, on average, more than 10 days with frost.

2.4 Vegetation

2.4.1 Introduction

The natural values on this property have been reduced by extensive OSTD, burning and grazing. Large areas have been ploughed and sown in grass, and wilding trees are spreading from a large patch of Douglas fir (*Pseudotsuga menziesii*) and *Pinus* species on

the north-west boundary, and a shelter belt which runs south-east from here. The property is noted for its "wilderness" community of bog pine (*Halocarpus bidwillii*) and mountain toatoa (*Phyllocladus alpinus*), some of which are included in the fenced off Bendhu Scientific Reserve.

Snow tussock and other indigenous plants still cover the upper hill slopes, though hawkweeds (*Hieracium pilosella*, *H. praealtum*, *H. lepidulum*) are common. Below the upper fence line, which traverses the slopes at about 1100m, OSTD has virtually created pasture land with indigenous species persisting within it. They include scattered tussocks, shrubs and smaller herbs such as patotara (*Leucopogon fraserii*), *Raoulia subsericea*, *Coprosma petriei*, *Geranium sessiliflorum*, *Pimelea oreophila*, *Luzula rufa* and *Rytidosperma pumilum*.

The lower land is rolling or gently sloping fans, with numerous small streams and wetlands. The whole area appears to have been oversown and some parts have been ploughed. In contrast, other parts retain a "wild" appearance due to the extensive areas of matagouri and cottonwood (*Cassinia fulvida*) shrubland, "wilderness" vegetation, red tussock (*Chionochloa rubra*), hard tussock (*Festuca novae-zelandiae*) rushes and herbs.

2.4.2 Upper tussockland

Above the upper fence line (about 1100m), snow tussock (*Chionochloa rigida*) is dominant with a cover of 30-50% on stony north faces, and up to 80% cover on shady south faces with mountain Fescue tussock (*Festuca mathewsii*) and blue tussock (*Poa colensoi*). Although the area has been OSTD, there is little evidence of introduced species other than hawkweeds. Mouse ear hawkweed (*Hieracium pilosella*) and king devil hawkweed (*H. praealtum*) dominate much of the inter-tussock cover, with tussock hawkweed (*H. lepidulum*) also being present. Many small indigenous herbs, grasses, sedges and low shrubs co-exist with the hawkweeds. These include *Rytidosperma pumilum*, *Raoulia subsericea*, *Leucopogon fraserii*, *Pimelia oreophila*, *Scleranthus uniflora*, *Anisotome flexuosa*, *Kellaria dieffenbachii*, *Muehlenbeckia axillaris*, *Lobelia linnaeoides*, *Lagenifera cuneata*, *Craspedia* sp., *Wahlenbergia albomarginata*, *Brachyscome sinclairii*, *Colobanthus buchananii* and *Schizeilema hydrocotyloides*. Golden speargrass (*Aciphylla aurea*) is scattered throughout, and coral broom (*Carmichaelia crassicaule*), indigenous broom (*Carmichaelia petriei*) and a threatened dwarf broom (*Carmichaelia vexillata*) occur occasionally. *Schoenus pauciflorus* is prominent in flush zones and upper wet gullies. Other than hawkweeds, sheep's sorrel (*Rumex acetosella*) is the main introduced plant, with white clover (*Trifolium repens*) occasionally being present.

Cushion plants occur on open rocky sites along the summit ridge.

2.4.3 Rock outcrops

Where they are large enough, rock outcrops provide refuges from fire and grazing, and support plants characteristic of rocky sites. Several large rock outcrops were seen along the summit ridge, and the plants found there were not seen elsewhere on the property. They include *Celmisia angustifolia*, *Celmisia lyallii*, *Dracophyllum pronum*, *Hebe buchananii*, *Aciphylla montana* var. *gracilis*, *Luzula rhadina*, *Grammitis poeppigiana*, *Gaultheria depressa* var. *novae-zelandiae*, *Pentachondra pumila*, *Celmisia laricifolia*, *Leptinella pectinata* var. *villosa*, *Brachyscome haastii*, *Acaena caesiiglauca* and *Blechnum penna marina*.

2.4.4 Mid and lower slopes

Below the mid-slope fence line, the effects of OSTD and heavier grazing are evident with a greening of the vegetation. Indigenous species are less prominent, and introduced species become dominant below about 900m, though many small indigenous species such as

Coprosma petriei persist. Patches of indigenous shrubs, especially matagouri (*Discaria toumatou*) become quite dense in gullies, valley bottoms and along streams. Snow tussock becomes patchy as introduced plants like sweet vernal (*Anthoxanthum odoratum*), browntop (*Agrostis capillaris*), hawkweeds, white clover and chewings fescue (*Festuca nigricans*) become dominant.

2.4.5 Shrublands

Shrublands occur in patches on hill slopes or as narrow riparian strips in valleys where matagouri dominates. Less common shrubs include *Coprosma propinqua*, *Olearia odorata*, indigenous broom and porcupine shrub (*Melicactus alpinus*), with the creeper *Muehlenbeckia complexa* and shield fern, *Polystichum vestitum*. Sweet brier (*Rosa rubiginosa*) is often present.

A large area of cottonwood (*Ozothamnus fulvida*) shrubland and associated hard tussock (*Festuca novae-zelandiae*) and introduced grasses is found on a fan near the southern corner of the property. Cottonwood shrubland is also found on a stony fan at the north end of the property. Other indigenous species present are mosses, lichens, *Pimelea traversii*, *Coprosma petriei*, *Pimelea oreophila*, low matagouri, hard tussock, blue tussock, occasional snow tussock, *Rytidosperma pumilum*, *Raoulia subsericea*, *Leucopogon fraserii*, *Luzula rufa* and three ground orchids, *Prasophyllum colensoi*, *Microtis uniflora* and *Thelymitra longifolia*. Introduced species are prominent including hawkweeds, white clover, sweet vernal, brown top and sheep's sorrel. Mosses and lichens are often prominent. The fan also supports extensive patches of manuka (*Leptospermum scoparium*), matagouri, *Coprosma propinqua* and snow tussock. Wilding trees are seeding into the area from the NW boundary and the NE shelterbelt.

A bog pine "wilderness" community is found in two large patches south of the homestead, and in several smaller remnants nearby. Most of one patch has been fenced and protected as a Scientific Reserve. There is much open ground between individual shrubs, which form large, spreading patches that shelter other plants. Other shrubs include mountain toatoa, coral broom, cottonwood, *Coprosma propinqua*, *Coprosma rigida*, *Coprosma petriei*, *Leucopogon suaveolens*, *Pimelea oreophila*, occasional matagouri and sweet brier (*Rosa rubiginosa*). Patches of open cottonwood shrubland occur within and between the bog pine communities. The open ground is often bare, with patches of mouse ear hawkweed, mosses and lichens. Other plants scattered through the area are hard tussock, sweet vernal, *Acaena caesiiglauca*, *Lycopodium fastigiatum*, king devil and tussock hawkweed. [The Reserve management plan notes the presence of the threatened *Raoulia parkii* here].

Wilding Douglas fir (*Pseudotsuga menziesii*) and *Pinus* species are prominent and pose a threat to the integrity of both main bog pine patches, though the landholder has removed many in the past.

2.4.6 Wetlands

A small wetland occurs between the larger bog pine patches. It contains patches of red tussock (*Chionochloa rubra*), *Schoenus pauciflorus*, *Carex sinclairii*, sphagnum moss (*Sphagnum cristatum*) and *Bulbinella angustifolia*, along with introduced lotus major, grasses and rushes. The adjacent terrace supports matagouri shrubland.

Schoenus pauciflorus is prominent in minor flush zones on mountain slopes, and there are extensive wetlands on the flats especially in the lower lying southern corner. All areas have been OSTD and are primarily dominated by introduced species, though hard tussock and red tussock (*Chionochloa rubra*) occupy small areas. The largest red tussock area occurs in the deer paddock, north of the airstrip. Other species found in these wetlands are sphagnum

moss (*Sphagnum cristatum*), *Bulbinella angustifolia* and various sedges such as *Carex sinclairii*.

2.4.7 Evaluation

Pasture development, burning and grazing has led to a higher proportion of introduced plants on this property, especially hawkweeds. Despite this indigenous communities persist and indigenous plants are sometimes dominant.

Development has occurred well uphill, but the tops are largely in a natural state with a good tussock cover for this type of country with skeletal soils and a dry climate. The vegetation is dominated by narrow-leaved snow tussock, while hawkweeds are the main introduced plants. Tussock cover is more dense on south or east aspects, in contrast to the open vegetation on north and west slopes exposed to the sun and NW winds. These sunny faces are more vulnerable to burning and grazing with slower recovery rates.

Although development has been greatest on flat to rolling low land it still retains many indigenous species, and interesting shrublands persist or are recovering after fire. This is particularly noticeable on old fan surfaces in the north end beyond the deer paddock. Along toe slopes quite large patches of cottonwood shrublands remain. Areas of hard tussock, introduced grasses and small patches of red tussock occur in wetter depressions and seepages.

The areas of bog pine are of international importance (Dr. B. Molloy pers. comm.). McGlone (1998) states that the scattered pockets of conifer scrub found throughout the southern South Island are relicts of a once widespread pre-human community. It would have formerly supported mountain toatoa, bog pine (*Halocarpus bidwillii*), Halls totara, snow totara and grey scrub species such as matagouri, *Olearia* spp., *Aristotelia*, *Coprosma* spp. and *Corokia*. Visually, there appears to be little difference between the bog pine in the scientific reserve and the adjacent unfenced area, apart from stock tracks in the latter. The presence of wilding trees up to 3 or 4m tall is a major concern, especially in the reserve. The smaller adjacent remnants of bog pine remnants are also important.

2.5 Fauna

The tops on the Diadem Range host the normal range of bird life, namely the pipit and NZ falcon. While the flats around the bog pine host a small population of introduced birds.

2.6 Historic

There are no known historic values on the property.

2.7 Public Recreation

2.7.1 Physical characteristics

Most of the property is steep mountain slopes at the southern end of the Diadem Range ranging in altitude from around 600 to 1615m. Summit slopes are more gently sloping, broad and rolling and extend north to the main part of the Diadem Range. Flat land is confined to relatively narrow river terraces and fans along the true left of the Ahuriri River and larger flats at both the north-west and south-east corners of the property. A number of small streams drain into Ribbonwood Creek and the Ahuriri River along the northwest facing slopes. Along the south-west side four larger catchments drain into the Ahuriri River, the largest being Lion Creek.

These streams, surrounding slopes them and the summit ridges are easily accessible for walkers via ridges and streams and at least six 4 wheel drive tracks which zig-zag up side-slopes to the summit ridge. The Ahuriri River terraces are also accessible by the Iron Bridge, a 4-wheel drive track and relatively open river flats. The property is classified as 'pastoral' in the Recreation Strategy for Canterbury (Department of Conservation, 1994) and according to FMC guidelines Birdwood would be mainly within an "open space" recreational experience zoning. For open space the descriptors are semi-natural grasslands under extensive grazing, accessible by roads, off-road vehicles and foot tracks.

2.7.2 Legal Access

The only legal access to the property is via the legal Quailburn Road.

2.7.3 Activities

The northern part of the Diadem Range is used for mountain biking, hangliding and parapenting, the high point on the adjoining Birdwood pastoral lease being one of the best hangliding sites in the basin. It is occasionally used by trampers and as an 'off-road rally' circuit. The view from the Diadem Range is quite spectacular, with a mountain backdrop of the Southern Alps highlighted by Mt Aspiring to the south with Mt Cook to the north.

In the lower country, there is little of recreation interest, except the existing Scientific Reserve.

PART 3

OTHER RELEVANT MATTERS & PLANS

3.1 Consultation

Meetings were held on 25 September 2001 in Christchurch and 26 September in Timaru with representatives from Federated Mountain Clubs, New Zealand Deer Stalkers Association, Peninsula Tramping Club, Canterbury Conservation Board, New Zealand Mountain Bike Association, Forest and Bird Society, Canterbury University Tramping Club, Opus Consultants, Mount Cheeseman Ski Club, Environment Canterbury, Friends of Lewis Pass, QEII, Pegasus Pig Hunting Club, as well as Public Access New Zealand, Fish and Game Council, QV Valuations, Knight Frank Ltd, Geraldine Tramping Club, 4 WD Club, Temuka Tramping Club, and Environment Canterbury in Timaru.

The main issues brought up in the meeting were -

- That maybe trail bikes could use the 4WD track.
- There is a need to control wilding tree spread on these properties

3.2 District Plans

Bendhu pastoral lease lies within the Waitaki District. The Proposed Waitaki District Plan was publicly notified in December 1996. Under this plan Bendhu is zoned RS (rural scenic). The Rural Scenic Zone contains areas of the District which have significant scenic values - the high country, rangelands and inland basin areas.

There are no significant sites identified on Bendhu by the Council in the plan i.e. none of the RAPs identified on Bendhu in the Mackenzie PNA survey or any SSWI's from Wildlife Surveys have been recognised in the plan.

The Plan is still under discussion with a number of interested parties.

3.3 Conservation Management Strategies

Bendhu pastoral lease lies in the CMS unit known as Waitaki. The key objectives for this unit relevant to tenure review are:

- to seek to protect, maintain and enhance the natural landscapes and natural landscape values of the Waitaki – through appropriate methods such as tenure review and district plans
- to identify the significant indigenous vegetation and threatened species of the unit and to use a range of effective methods to protect the indigenous biodiversity as well as protecting and enhancing the viability of priority threatened species populations and their habitats in the unit.
- For recreation and access the Conservancy's objectives are to provide new recreational facilities and opportunities by the Department, other organisations and concessionaires where natural and historic resources and cultural values are not compromised, and to liaise with adjacent landholders to resolve conflicts over access for recreation to land managed by the Department.
- To reduce and maintain rabbit and thar densities to levels that ensure their adverse effects on natural values are minimised

Other priorities identified in the CMS that are Conservancy wide and relevant to tenure review on these properties are – to undertake necessary actions to secure the conservation of Category A and B species, including predator control, fencing and habitat protection. The species listed as priority include New Zealand falcon, wrybill, black-fronted tern and banded dotterel.

PART 4

MAPS ETC.

4.1 Additional information

4.1.1 References

Department of Lands and Survey 1983. Draft Bendhu Scientific Reserve Management Plan. *Management Plan Series No. Sc R 7*. Department of Lands and Survey, Dunedin.

Hitchmough R et al. 2001. Draft threatened species database, November 2001. Department of Conservation, Wellington.

McGlone, M.S.; Moar, N.T. 1998: Dryland Holocene vegetation history, Central Otago and the Mackenzie Basin, South Island, New Zealand. *New Zealand Journal of Botany* 36: 91-112

4.2 Illustrative Maps

4.2.1 Topo/Cadastral

4.2.2 Values map