

# **Crown Pastoral Land Tenure Review**

**Lease name : SHAG VALLEY STATION**

**Lease number : PO 331**

## **Conservation Resources Report - Part 1**

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

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

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

**March 05**

**DOC CONSERVATION RESOURCES REPORT  
ON TENURE REVIEW OF**

**SHAG VALLEY PASTORAL LEASE  
(P 331)**

**UNDER PART 2 OF THE CROWN PASTORAL  
LAND ACT 1998**

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**DOC CONSERVATION RESOURCES REPORT ON TENURE  
REVIEW OF SHAG VALLEY PASTORAL LEASE (P 331)  
UNDER PART 2 OF THE CROWN PASTORAL LAND ACT  
1998**

**PART 1  
INTRODUCTION**

**1.1 Introduction**

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

Shag Valley PL (1,821 ha) lies on the northwest-southeast orientated Horse Range, about 20 km northwest of Palmerston. The PL is predominantly in the headwater catchments of the Waianakarua River Middle Branch (MBWR), but the southeast portion of the PL includes part of the headwater catchments of the Waianakarua River South Branch (SBWR). The PL extends from 280m in the MBWR up to 965m at the high point east of Conical Peak.

Shag Valley PL was inspected between 11 – 12th December 2003 by a team of specialists. Their findings are incorporated in this report.

**1.2 Ecological Setting**

Shag Valley PL falls within the Kakanui Ecological Region (ER), straddling the boundaries of the Dansey and Waianakarua Ecological Districts (ED). Shag Valley PL lies at the southeast extent of the Dansey ED, which is centred on the generally higher, non-glaciated Kakanui Mountains inland to the northwest (McEwen, 1987). A Protected Natural Areas Programme survey report has been completed for the Dansey ED (Comrie, 1992) and no recommended areas for protection (RAP) were identified on the PL. The southeast portion of the PL lies in the Waianakarua ED. The Waianakarua ED includes the lower downlands of the Horse Range and extends to the coast, from Shag Point to Moeraki. No PNA report has been prepared for the Waianakarua ED.

Shag Valley PL adjoins conservation unit I42 038, being the Waianakarua Scenic Reserve (total area 4035 ha) and conservation unit I42 039, being Waianakarua River (Middle Branch) Marginal Strip (total area 2 ha).

**PART 2****INHERENT VALUES: DESCRIPTION OF CONSERVATION RESOURCES AND ASSESSMENT OF SIGNIFICANCE****2.1 Landscape**

The Shag Valley PL features an incised landscape of relatively gentle ridges and spurs with moderate to very steep faces dropping to valley floors. Located strategically within the Horse Range, the PL lies adjacent to an expansive natural area designated as public conservation land (Waianakarua Scenic Reserve) and land subject to the tenure review process. These connections with adjoining similar natural areas make this PL important to the protection of the wider distinguishable high country landscape within the Waianakarua district.

**METHODOLOGY**

A transect of the PL was carried out utilizing farm access tracks. Three landscape units (LUs) were identified on Shag Valley PL as shown on Map 4.2.2.

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

- Naturalness –an expression of the degree of indigenous content of the vegetative cover and the extent of human intervention.
- Legibility –an expression of the clarity of the formative processes and how striking these physical processes are.
- Aesthetic values –includes the concepts of memorability and naturalness. Aesthetic factors that can make a particular landscape vivid include simplicity in landform, muted colours and fine textured ground cover.
- Historical values – areas containing high heritage importance.

Visual values or “visual amenity” are described and an assessment of the vulnerability to change of each LU is made.

**2.1.1 LU1 North Side MBWR****Description**

The extensive LU1 encompasses the entire PL on the north side of the MBWR. To the north LU1 is bound by the summit ridgeline that forms the watershed between the MBWR and the upper catchment of the North Branch Waianakarua River (NBWR). To the south the limit of LU1 is the valley floor that contains the MBWR. The northeast boundary follows the survey line separating this PL from the neighbouring scenic reserve. The altitudinal range extends from 965m near Conical Peak down to 280m where the MBWR drains out of the PL via a narrow valley.

The physical character of LU1 is typified by a series of short head basins that contain over-steepened sides. These precipitous slopes feature large angulated slabs of parent rock, normally located just below the summit. Other rock outcroppings of varying significance jut from the mid slopes. A sequence of dissected side gullies separates the head basins from the main valley. These short deep gullies are divided by knobby spurs that descend rapidly to the valley floor. On the valley floor the headwaters of the MBWR meander over a wide bedload of loose alluvial gravel. The tributaries of the MBWR commonly have their origins in narrow finger bogs sited just below the summit ridgeline.

Vegetation on these predominantly dark aspect slopes comprises narrow-leaved snow tussock, supplemented by subalpine native species of the Horse Range including golden spaniard, false spaniard, alpine daisy, prostrate snowberry and a dwarf heath. Sporadic native broom survive in refuges, especially within rock outcropping. On lower sunny slopes, the tall tussock has been replaced by more modified tussocklands. In the deeper-sided gullies, remnants of broadleaved forest survive. The principal species comprise broadleaf, marbleleaf, red mapou and the occasional lancewood. In the more constricted sections of the valley, *Coprosma* shrublands are beginning to repatriate the floor of the valley and the lower side slopes. Occasional wilding pine have established on the main ridgelines.

### **Landscape Values**

LU1 has high inherent landscape values owing to the overall coherent impression of the tall tussocklands. The presence of substantial rock outcropping provides the unit with some natural diversity and points of interest. The factors that make this unit aesthetically distinct include:

- The striking contrast in colour and texture between the tussocklands and rock outcropping.
- The sense of uniformity due to the lack of hard-edged changes in land use.
- Back country image reinforced by the lack of “built” elements.

A notable feature of LU1 is its well-defined physical boundaries that help to make it a definable and recognizable entity. In combination with the adjoining Waianakarua Scenic Reserve the area contributes to an uninterrupted sequence of natural landscape types that extend from tall tussock grassland to mixed broadleaved forest.

### **Visual Values**

This unit has limited visual resource value with views of Conical Peak being restricted to vantage points either on the PL or neighbouring hill country. The balance of the unit is visually obscured owing to the intervening ridgelines, especially the major ridge that looks over the Shag Valley towards the west.

## **Potential Vulnerability to Change**

LU1 has the potential to be adversely affected by changes in land use and activities; including the following:

- The spread of wilding pines.
- Increased production and further subdivision that would fragment the existing uniformity of the grasslands.
- Further earth disturbances, e.g. bulldozed fence lines, which can form corridors for opportunist species to infest grasslands.
- Decline in the ecological health of the remnant broadleaved forest and shrublands with palatable species being grazed out by stock.

### **2.1.2 LU2**

#### **Description**

LU2 incorporates the north-facing side slopes that overlook the headwaters of the MBWR and is defined in the southwest by a prominent ridgeline that separates the PL from the long slopes that descend to the Shag Valley floor. In the northeast the MBWR forms the limits to LU2 while the upper and lower boundaries are the well-defined ridgelines. The altitudinal range of the unit extends from a high point of 715m along the summit ridgeline in the north, dropping to 400m within a gorge that contains a major tributary of the MBWR.

The dominant landform of LU2 is the colluvial side slopes that descend at a constant grade from the prominent ridgeline in the southwest down to the valley floor and the MBWR. To the south of LU2 the topography changes to a block of undulating rounded hills separated by a series of low saddles.

A number of permanent and ephemeral watercourses, contained within shallow indentations, drain off the colluvial side slopes. Unlike the corresponding darker aspect faces on LU1 these long colluvial side slopes have limited rock outcropping with intermittent localized rock formations on the mid slopes.

The composition and quality of the vegetation is influenced by the unit's sunnier aspect and stock pressure. Primary ground cover in the mid and upper sections of the unit is modified tussockland supplemented by a mixture of native herbs and introduced grasses. Modification of the tussocklands increases in the lower, rounded hill section of the unit where short tussock is widely distributed but introduced grasses become dominant. On drier lower slopes hawkweed becomes increasingly conspicuous. LU2 is generally clear of wilding pines.

#### **Landscape Values**

LU2 has only moderate inherent landscape values due to the extent of conversion to improved farmland. The unit does not contain any particular natural features that make a special contribution to the recognizable landscape character of the Horse

Range. The unit represents dissected hill country within the Horse Range that has been extensively modified for semi-intensive dryland farming.

### **Visual Values**

The unit has low visual resource value due to its being enclosed by the surrounding ridgelines that form PL boundary.

### **Potential Vulnerability to Change**

LU2 has the potential to be adversely affected by changes in land use and activities; including the following:

- Introduction of a monocultural land use such as plantation forestry.
- Spread of wilding pines, especially from the southwest.
- Further decline and loss of snow tussocks due to intensification of land use.
- Insensitive tracking, especially zigzag alignments along prominent ridgelines and narrow spurs.

### **2.1.3 LU3**

#### **Description**

LU3 incorporates all of the lower hill country at the southern end of the PL including the discrete headwaters of the SBWR and the hill slopes on the true left of the SBWR. The unit's southwest boundary closely follows the winding channel of the SBWR. In the northeast LU3 is defined by the chain of rounded knolls, the highest being 668m. In the south the boundary of both LU3 and the PL taper to an apex.

LU3 is characterized by a bowl-shaped valley floor flanked by evenly graded side slopes. These are commonly broken by Y-shaped gullies, the Y shape defined by a main gully joined by a smaller tributary. Most of these gullies contain watercourses that drain directly into the SBWR.

The vegetation has been influenced by aspect, altitude and farming methods. The valley floor and adjoining lower flanks has been converted to exotic grasslands. Remnant broadleaved forest/shrubland occupies the deep Y-shaped gullies. The upper section of the SBWR is lined with discontinuous remnants of *Carex* spp. In the lower section these sedgeland are replaced by woody weeds.

#### **Landscape Values**

Similar to LU2 this unit has only moderate inherent landscape values owing to the degree of change that has occurred to the original ground cover for production purposes. This unit's land use pattern is more fragmented in nature than LU2 due to the weedy nature of the valley floor. LU3 still contains intermittent residual natural areas with moderate landscape values owing to their disjointed character.



## **Visual Values**

LU3 has moderately low visual resource value with most of the valley floor and side slopes being obscured from any vantage points by the surrounding high ridgelines.

## **Potential Vulnerability to Change**

LU3 has the potential to be adversely affected by changes in land use and activities; including the following:

- Shelter planting that would affect the open character of the existing grasslands.
- Introduction of a high impact monocultural land use such as plantation forestry.
- Decline in the ecological health of the remnant broadleaved forest and shrublands.

### **2.1.4 Significance of landscape**

The landscape of Shag Valley PL contributes to the wider distinguishable high country landscape within the Waianakarua District. This is enhanced through its connection with the Waianakarua Scenic Reserve, with adjoining similar areas and through the presence of large areas of tussockland free from 'built' elements or hard edged changes of land use.

LUI contains the full suite of landscape and vegetation types contained within the Waianakarua ED. The uninterrupted sequence from tall tussock grasslands to broadleaf mixed forest characterises the original integrity of the districts landscape. LU3 contains areas of high inherent value, in particular, vestiges of broadleaved forest/shrublands which occupy the deep Y-shaped gullies. The remainder of the property is representative of the Horse Range, comprising narrow-crested ridges, V-shaped gullies, substantial rock outcropping and grasslands.

## **2.2 Landforms, Geology & Soils**

The Shag Valley Station PL is located within the broad band of high dissected hills which form the transition zone between the Kakanui Mountains and the Horse Range, the latter rangelands grading into the lower coastal Razorback Range. Collectively, these mountain lands and high hills form a major land divide which links the South Island's eastern high country to the east coast.

These ranges lie on the upthrow side of the Waihemo Fault. They are mostly steep and incised, but contain some relicts of the Otago peneplain surface. Landforms on the Shag Valley PL comprise dissected hill country with generally steep rolling hillsides interspersed with narrow valley floors. The wider MBWR, lying northwest-southeast, dissects the property.

The geology of the Kakanui Ecological Region which includes the Dansey and Waianakarua ED's is mainly Haast schist with some Torlesse greywacke. This is overlain in parts of the Waianakarua ED with loess, tertiary coal measures, limestone, sandstone, basaltic tuffs and lavas.

The soils of the Waianakarua ED are derived largely from schist or greywacke loess. The soils comprise: yellow-brown earths; yellow-grey earths; some small areas of dark coloured recent, limestone derived rendzina soils; and small areas of brown basalt derived granular loams (Comrie, 1992). The dominant soil set on Shag Valley PL are yellow-brown earths from the Hurunui set, though a small area of yellow-brown earths from the Kaikoura set occur in the area of Conical Peak stretching toward Bells Saddle.

### 2.2.1 Significance of geology, landforms and soils

None of the above characteristics are significant on either a local or ecological district scale. There are no geopreservation sites on the lease.

## 2.3 Land Environments of New Zealand

The environmental distinctiveness of this area has been assessed through the Land Environments of New Zealand (LENZ). This is a classification of New Zealand landscapes using a comprehensive set of climate, landform and soil variables chosen for their roles in driving geographic variation in biological patterns (Leathwick et al. 2003). It is presented at four levels of detail containing 20, 100, 200 or 500 environments nationally.

At Level III classification (200 Environments) four land environments are represented on the PL. Predominant is Environment Q2.1 which includes most of the land below 650m. In order of decreasing area, the remainder comprises Q1.1 on the highest ridges descending to around 650m, Q4.1 on north-facing slopes near Mt Fortune and N3.3 in pockets scattered across Sunny Face 1, Sunny Face 2 and the Mt Fortune blocks. The percent of these environments protected nationally is shown in Table 1.

TABLE 1 LENZ Level III in descending order of % protected nationally

Level III Environment	National area (hectares)	Area of Environment Protected (hectares)	Percentage of national area protected
Q1.1	662,318	164,172	~25%
Q4.1	473,673	112,813	~24%
Q2.1	407,352	31,996	<8%
N3.3	120,439	714	<0.6%

The Q1, Q2 and Q3 environments within Shag Valley PL are cool and relatively dry with well-drained soils and relatively high soil fertility compared to other montane environments. Common in the southeast of the South Island, these environments are associated with extensive mountain and hill country areas (Leathwick et al. 2002). The N3.3 environment is similar in character to the Q environments but typically drier and associated with undulating plains.

Leathwick et al. (2003) identify the predominant pre human vegetation in these Q environments as low altitude forest with rimu, miro, matai and kahikatea forming an overstorey to broadleaved canopy where broadleaf, pokaka, lemonwood, narrow-leaved lacebark and ribbonwood predominated. Within the N3 environment, the downlands of North Otago were covered with forest of totara, matai and trees such as broadleaf, ribbonwood, narrow-leaved lacebark and kowhai. The highest driest more inland parts of N3 supported forest of mountain totara and mountain toatoa.

### **2.3.1 Significance of Land Environments New Zealand**

Nationally, substantial areas of Q1.1 and Q4.1 environments are becoming protected. However, less than 8% of Environment Q2.1 and less than 0.6% of Environment N3.3 are protected for conservation purposes. This is well below the 20% suggested for the protection of native biodiversity.

## **2.4 Climate**

Climates in both the Dansey and Waianakarua EDs are described as subhumid with cool winters and mild summers. Annual rainfall in Waianakarua ED is given as 600-800mm (McEwen, 1987), but could be greater in the higher parts of the PL within the Dansey ED as rainfall in the Dansey ED measures up to 1400mm on higher altitude slopes of the Kakanui Mountains.

## **2.5 Vegetation**

Vegetation in the lease varies from introduced pasture grasses to extensive areas of relatively intact long tussock grassland, with indigenous inter-tussock species. There are areas of rocky bluff habitat at both high and low elevations, and limited fine screens associated with the former. The lease has a series of residual forest habitats at moderate-low altitude, restricted to generally steep, rocky gullies. A major feature within the lease is a large active braided stream flat in the head of the MBWR.

Shag Valley PL is split into clearly identifiable and named farm blocks (Map 4.2.4). These block names have been used throughout this section to identify different areas of vegetation. Six main vegetation and habitat types were recognised: stony river flat, river terrace, pasture/short tussock grassland, tall tussock grassland, shrubland and broadleaved forest. A list of vascular plant species is given in Appendix 1.

### 2.5.1 Stony river flat

This habitat is largely restricted to periodically-flooded river flats below the North Face blocks in the MBWR, but occasionally occurs at stream junctions further down the catchment. The habitat appears to be formed as the result of alluvial deposition of gravels from active erosion gullies in the basin below Conical Peak, resulting in a small braided river. The vegetation is dominated by native species and consists of scattered plants of silver tussock (*Poa cita*) and hard tussock (*Festuca novae-zelandiae*) among mats of bidibid (*Acaena inermis*), *Muehlenbeckia axillaris*, *Epilobium microphyllum*, *Geranium sessiliflorum* and *Raoulia tenuicaulis*. The sedge *Carex buechananii* occurs close to the river. Of the exotics, two small annual grasses, *Aira caryophylla* and *Vulpia bromoides*, are common while sweet vernal (*Anthoxanthum odoratum*) and mouse-ear hawkweed (*Hieracium pilosella*) are occasional. This vegetation type is common in districts to the west, but is uncommon in East Otago.

### 2.5.2 River terrace

Immediately above the stony flats there are well-vegetated river terraces supporting a mosaic of seepages and *Carex* fens, short tussock grassland, shrub thickets and stands of tall tussock grassland.

Seepages are vegetated in a short turf with emergent rushes and toetoe (*Cortaderia richardii*) and a diverse range of other species, including the natives *Blechnum pennamarina*, *Juncus gregiflorus*, sharp-spike sedge (*Eleocharis acuta*), *Microtis unifolia*, toetoe, *Acaena novae-zelandiae*, *Ranunculus glabrifolius*, *R. multiscapus*, *Epilobium brunnescens*, *Lagenifera petiolata*, *Hydrocotyle novae-zeelandiae*, native mint (*Mentha cunninghamii*), and the exotics jointed rush (*Juncus articulatus*), *Isolepis setacea*, sweet vernal, purging flax (*Linum catharticum*), bog stitchwort (*Stellaria alsine*), catsear (*Hypochaeris radicata*), mouse-ear chickweed (*Cerastium fontanum*), turf speedwell (*Veronica serpyllifolia*), grassland forget-me-not (*Myosotis discolor*), pearlwort (*Sagina procumbens*) and watercress (*Nasturtium microphyllum*).

*Carex* fens are dominated by *Carex coriacea* and *C. secta*, with occasional *C. buechananii*. Both these fens and the seepages described above have suffered some pugging by cattle.

Silver tussock is the dominant short tussock species on these terraces, while intact stands of narrow-leaved snow tussock, *Chionochloa rigida*, are present locally.

Shrub thickets are dominated by matagouri (*Discaria toumatou*), *Coprosma rugosa*, *C. propinqua*, *Olearia bullata*, shrub pohuehue (*Muehlenbeckia complexa*) and prickly shield fern (*Polystichum vestitum*), with the native *Oxalis exilis* a common groundcover species.

### 2.5.3 Pasture/short tussock grassland

Native vegetation has been heavily modified on drier north faces and at lower elevations. The original tall tussock cover has largely been replaced by pasture species with patches of silver tussock, hard tussock, blue tussock (*Poa colensoi*) and occasional narrow-leaved snow tussock. Exotic grasses and herbs are dominant, particularly on the North Face 1-3 blocks, where recent fire has depleted the short tussock cover. Exotic species include the grasses sweet vernal, cocksfoot (*Dactylis glomerata*), Yorkshire fog (*Holcus lanatus*), barley grass (*Hordeum vulgare*) and soft brome (*Bromus hordeaceus*). Herbaceous exotics include white clover (*Trifolium repens*), suckling clover (*T. dubium*), catsear, foxglove (*Digitalis purpurea*), cleavers (*Galium aparine*), mouse-ear chickweed, winged thistle (*Carduus tenuiflorus*), nodding thistle (*Carduus nutans*), mouse-ear hawkweed, sheep's sorrel (*Rumex acetosella*), woolly mullein (*Verbascum thapsus*) and Australian sheep's burr (*Acaena agnipila*). Native herbs include *Wahlenbergia albomarginata* and the bidibid *Acaena novae-zelandiae*. In fire refuges at lower altitudes, remnant shrubs of porcupine shrub (*Melicytus alpinus*) and matagouri occur together with bracken (*Pteridium esculentum*), the lianes lawyer (*Rubus schmidelioides*) and bindweed (*Calystegia turguriorum*). This vegetation type is also found on the two Round Hill blocks and on the lower parts of Sunny Face 1. Occasional kowhai trees (*Sophora microphylla*) are present on dry faces.

### 2.5.4 Tall tussock grassland

Dense tall tussock grassland dominated by narrow-leaved snow tussock occurs over most of the country on the true left of the MBWR (mainly the Marble Face and Mt Fortune blocks) and in much of the North Face 4 block. The exception is near the boundary with North Face 3 where fire has diminished the tall tussock cover in one localised area. Tussock stature and deep litter layers suggest that the country to the true left of the river has not been burned for some time. Hard tussock, *Blechnum penna-marina*, *Acaena caesiiglauca*, *Pimelea oreophila*, *Elymus solandri* and *Ranunculus multiscapus* are common inter-tussock species at lower altitudes (400-600 m), with mountain flax (*Phormium cookianum*) and occasional shrubs of *Olearia bullata*, *Coprosma rugosa* and matagouri. *Shoenus pauciflorus* dominates the seepage areas and *Carex flagellifera* is occasionally present. Above 700 m, turpentine shrub becomes more prominent, while tussock hawkweed (*Hieracium lepidulum*), *Hymenophyllum multifidum*, *Coprosma cheesemanii*, *Brachyglottis lagopus* and *Forstera tenella* occur only occasionally above 800 m. *Aciphylla scott-thompsonii* extends to these altitudes in gullies. Coral broom (*Carmichaelia crassicaule*) occurs above 900 m on Conical Peak at the head of the MBWR catchment.

The lowest slopes, particularly on dry north aspects, have less narrow-leaved snow tussock and more silver tussock and hard tussock, with exotic grasses and mouse-ear hawkweed common inter-tussock species.

Stock camps with denuded plant cover occur locally on ridges at the 600 m level. These areas include small rock outcrops and support a distinctive vegetation comprising shrubs of matagouri, *Gaultheria crassa*, turpentine shrub (*Dracophyllum uniflorum*), tauhinu (*Ozothamnus leptophyllus*) and subshrubs of *Pimelea*

*pseudolyallii*, *Leucopogon fraseri* and *Pentachondra pumila*. Blue tussock is common here. Herbs in this habitat include *Kelleria dieffenbachii*, *Thelymitra* sp., *Brachyscome sinclairii*, *Luzula rufa*, *Gingidia decipiens*, *Leptinella pectinata*, *Lycopodium fastigiatum*, *Scleranthus uniflorus*, golden spaniard (*Aciphylla aurea*), *Raoulia glabra*, *Anaphalioides bellidioides*, *Ranunculus multiscapus* and *Celmisia hookeri*. Exotic species include sweet vernal, *Aira caryophyllea* and mouse-ear hawkweed.

Rock outcrops at intermediate altitudes support a characteristic flora of ferns (*Microsorium pustulatum*, *Asplenium hookerianum*, *A. richardii* and *A. flabellatum*), shrubs (*Helichrysum aggregatum*, porcupine shrub, *Gaultheria crassa*, *Fuchsia perscandens*, *Rubus cissoides*), grasses (*Rytidosperma pumilum*, *Poa colensoi*, *Elymus solandri*) and herbs (*Celmisia hookeri*, *Anaphalioides bellidioides*, *Colobanthus strictus*, *Gingidia* sp. aff. *montana*, *Acaena dumicola*, *Wahlenbergia albomarginata*). Small screes below these bluffs support occasional shrubs of *Carmichaelia petriei*, golden spaniard and the thousand-leaved fern (*Hypolepis millefolium*). Most of the blocks to the southeast (Sunny Face 1 and 2, Dark Face and Rookery) have more or less continuous cover of narrow-leaved snow tussock above 500 m altitude, although tussock stature is low in comparison with the Marble Face and Mt Fortune blocks and the litter layer is shallow or absent. The exception is the lower parts of Sunny Face 2 which support relatively intact tussock grassland. Although many native inter-tussock species are present, inter-tussock areas tend to be dominated by exotic grasses, clover and herbaceous weeds. This includes mouse-ear hawkweed in drier sites. Subfossil totara wood is present in snow tussock grassland in the Rookery block, and bluffs within this block support populations of the shrub *Helichrysum intermedium*, which was not observed elsewhere on the PL.

### 2.5.5 Shrubland

Dense shrublands are common on shady, bluffy slopes leading down to the MBWR and its tributaries. The dominant species are matagouri, *Coprosma propinqua* and *C. rugosa*, with occasional *C. crassifolia*, porcupine shrub, *Olearia bullata*, koromiko (*Hebe salicifolia*), tutu (*Coriaria arborea*) and *Carmichaelia petriei*. Mature trees of broadleaf (*Griselinia littoralis*) are sometimes present, indicating a successional trajectory toward low forest. Lianas occurring in these shrublands include *Calystegia turguriorum*, *Rubus schmidelioides*, pohuehue (*Muehlenbeckia australis*), *Scandia geniculata* and *Clematis afoliata*. *Gingidia* sp. aff. *montana* and *Celmisia hookeri* are abundant on bluffs. The ferns *Blechnum chambersii* and *B. novae-zelandiae* occur on damp, shady streamsides, while hard tussock, blue tussock, *Acaena dumicola*, *A. caesiiglauca*, golden spaniard and *Blechnum penna-marina* are common on drier aspects. A single plant of *Olearia lineata* was observed on a river terrace on the true left of the river below the Round Hill 2 block.

Shrub thickets also occur in several gullies at lower altitudes in narrow-leaved snow tussock grassland. *Coprosma propinqua*, *C. rugosa* and matagouri are the dominant shrubs in these gullies. In addition to these species, linear shrublands beside streams in the Mt Fortune block include *Carmichaelia petriei*, occasional *Olearia bullata* and kowhai, and the large forest tussock, *Chionochoa conspicua*.

On the east-facing side of the main spur in the Mt Fortune block, dense shrublands extend into snow tussock grassland above the broadleaved forest of the adjoining Waianakarua Scenic Reserve.

### 2.5.6 Broadleaved forest

Many remnants of broadleaved forest, of varying size, are present in Shag Valley PL. These are indicative of the extent of the broadleaved forest prior to conversion of the land for pastoral use. The remnants are all associated with riparian sites, extending upslope to varying degrees. Broadleaf is the most common canopy species occurring in all remnants. The understorey and ground cover within even the smallest of these remnants is diverse and dominated by native species. Forest remnants in the Marble Face and Mt Fortune blocks have a different character to those in the Rookery block, reflecting the change from the Dansey ED to the Waianakarua ED. Three forest remnants, being representative of other unvisited remnants, were examined in some detail. These are described below:

Marble Face 1 - GR I42: 207435. A small forest remnant is associated with a small bluff above stony river flats beside the MBWR. Broadleaf forms the canopy. Shrubby bluffs adjacent to the remnant support *Coprosma propinqua*, *Gingidia* sp. aff. *montana*, *Anisotome brevistylis*, *Asplenium flabellifolium*, *Cystopteris tasmanica*, *Leucopogon fraseri*, *Anaphalioides bellidioides* and *Wahlenbergia albomarginata*. Damp, shady banks within the forest are vegetated in a dense herbaceous turf of *Corybas macranthus*, *Oxalis lactea*, *Cardamine corymbosa*, *Oreomyrrhis ramosa*, *Lagenifera cuneata*, *Hydrocotyle moschata*, *Ranunculus glabrifolius* and the ferns *Asplenium richardii*, *Blechnum novae-zelandiae*, *B. chambersii* and *Polystichum vestitum*. Wet sites at the bases of these banks are occupied by *Carex secta*, *C. solandri* and the native bidibids *Acaena anserinifolia*, *A. dumicola* and *A. novae-zealandiae*. Tutu, *Calystegia turguriorum* and *Fuchsia perscandens* occur in canopy gaps.

Marble Face 2 - GR I42: 221435. Slightly larger than Marble Face 1, a second forest remnant is located where a MBWR tributary passes through a rocky gorge. Shrublands surround the forest, in which broadleaf is again the dominant canopy species, but lancewood (*Pseudopanax crassifolium*), narrow-leaved lacebark (*Hoheria angustifolia*) and kohuhu (*Pittosporum tenuifolium*) are occasionally present in the canopy. Other native shrubs and trees include cabbage tree (*Cordyline australis*), porcupine shrub, marble leaf (*Carpodetus serratus*), tree nettle (*Urtica ferox*), *Carmichaelia petriei*, *Coprosma crassifolia*, *C. propinqua*, koromiko, *Fuchsia perscandens* and wineberry (*Aristotelia serrata*). The exotic woody species elder (*Sambucus nigra*) and broom (*Cytisus scoparius*) are sporadic. This remnant contains a remarkable diversity of some 15 fern species being: *Asplenium bulbiferum*, *A. flabellifolium*, *A. flaccidum*, *A. hookerianum*, *A. lyallii*, *A. richardii*, *Blechnum chambersii*, *B. fluviatile*, *B. novae-zelandiae*, *B. penna-marina*, *B. procerum*, *Hypolepis millefolium*, *Microsorium pustulatum*, *Polystichum neozelandicum* subsp. *zerophyllum*, *P. vestitum*), as well as the orchids *Corybas macranthus* and *Pterostylis banksii*. Remnants similar to this one, but sometimes with more narrow-leaved lacebark and kowhai in the canopy, occur nearby in other tributaries of the MBWR.

Rookery – GR I42: 258405. A relatively large forest remnant exists here, on fertile soils on the sides of gullies. Recent fire has destroyed one area of canopy on the true left of this forest. Two additional forest remnants occur in similar situations in the same block. In contrast to the remnants in the Marble Face and Mt Fortune blocks, a number of species share dominance in the canopy. Many species seen here (underlined) were not observed in the Marble Face and Mt Fortune remnants. The forest is fringed by shrublands dominated by *Coprosma propinqua*, *C. rigida* and mountain flax, with occasional *Coprosma virescens*. Within the forest, the main canopy species are broadleaf, lancewood, marble leaf, wineberry, narrow-leaved lacebark, lemonwood (*Pittosporum eugenioides*) and three finger (*Pseudopanax colensoi*). Kaikomako (*Pennantia corymbosa*), rare in the Waianakarua Scenic Reserve (Ward & Munro, 1989) and not recorded from the Dansey ED (Comrie, 1992), is a common canopy species here. Mapou (*Myrsine australis*) and lowland ribbonwood (*Plagianthus regius*) occasionally reach the canopy. In the understory, koromiko, tree nettle, wineberry, mahoe (*Melicactus ramiflorus*), *Coprosma rotundifolia*, *Fuchsia perscandens* and saplings of the canopy species are common, although in areas where stock have access, recruitment of palatable species such as lemonwood, mahoe, mapou and kaikomako is being inhibited. Ground cover includes most of the species found in the Marble Face 2 remnant, as well as *Hydrocotyle microphylla*, the orchid *Pterostylis sp. aff montana*, three species of bidibid (*Acaena anserinifolia*, *A. dumicola* and *A. juvenca*), *Libertia ixiodes*, *Poa imbecilla*, the native buttercup *Ranunculus membranifolius* and the liane *Clematis marata*. Stock is having a significant effect on regeneration of canopy and understorey species in the forest remnants in the Rookery block, particularly on easier terrain.

### 2.5.7 Problem Plants

Broom (*Cytisus scoparius*) is occasional near the Marble Face 2 remnant, but a more serious infestation is present in the Mt Fortune block. Initial invasion appears to have occurred in steep tussock grassland, spreading downhill in tussock grassland to meet a forest remnant in the gully below. In this gully it occurs intermixed with native vegetation in a narrow band beside the stream, above the stock yards. Most plants were mature and flowering.

Single plants of gorse (*Ulex europaeus*) were occasionally seen in the Marble Face block. Two large infestations of gorse were noted along the long spur west of Bells Saddle (within Mt Fortune block). These are likely to be discharging seed downhill into the scenic reserve.

Wilding pines (*Pinus contorta*) are occasional in the Marble Face block and are scattered at higher density across the higher parts of the Mt Fortune block.

Mature plants of elder (*Sambucus nigra*) were occasionally seen in the vicinity of the Marble Face 2 remnant. This species has fleshy fruits which are dispersed by both native and exotic birds, and has the potential to invade and persist in shrublands and forest fragments, but tends not to form monospecific stands. Its adverse effects on indigenous vegetation are partially mitigated by its presence as a food source for native birds.



Mouse-ear hawkweed (*Hieracium pilosella*) and tussock hawkweed (*H. lepidulum*) are both present on the PL. The former is prominent on sunny aspects at low altitudes in snow tussock grassland, while tussock hawkweed occurs occasionally in tussock grassland at higher altitudes.

### 2.5.8 Significance of vegetation

The following distinct and relatively intact indigenous vegetation types occur in the Shag Valley PL:

- A river gravel community that is more typical of those found on montane braided rivers in western districts, rather than of eastern Otago streams. This community is much more intact than gravel river edge communities in the nearby Waianakarua Scenic Reserve (Ward & Munro 1989).
- Montane shrublands and broadleaved forest remnants representative of indigenous forest which now occurs only on a very restricted basis within the Dansey ED (Comrie, 1992).
- Significant area of intact snow tussock grassland that extends from relatively low altitude (400 m) to 950 m and includes considerable rock outcrop habitat.

The PL straddles the transition between the Dansey and Waianakarua EDs and contains ecosystems that are representative of both. A floristic gradient is associated with this transition, with many species at the southeast end of the PL not being found in the northwest part. An intact altitudinal ecological sequence provides habitat for several threatened species and some species at their distributional limits. Scattered forest remnants provide seed sources for forest expansion.

The following species recorded in Shag Valley PL are classed by Hitchmough (2002) as being nationally threatened: *Carmichaelia crassicaule* (gradual decline); *Clematis marata*, *Celmisia hookeri*, *Olearia bullata*, *Olearia lineata*, *Pimelea pseudolyallii* (sparse); and *Pterostylis* aff. *montana* (data deficient); and *Gingidia* aff. *montana* (range restricted).

## 2.6 Fauna

### 2.6.1 Invertebrate fauna

Weather during the survey was fine and hot with warm evenings. Invertebrates were hand-collected during the day. The major effort was put into assessing the range and quality of available habitats.

### **Invertebrate habitat**

A large proportion of the lease is vegetated in tall tussock grassland. Through much of the higher altitude areas in Marble Face and Mt Fortune blocks the tussocklands have diverse indigenous inter-tussock plant species. This creates ideal habitats for a diverse indigenous grasslands fauna. Adventive plant species are largely absent from these altitudes. A rich diurnal invertebrate fauna is apparent throughout this area, including the tussock butterfly *Argyrophenga janitae*, a range of moth species and many Diptera, Hymenoptera and Hemiptera.

Below Conical Peak, in Marble Face block, very steep slopes are broken by a series of vertical rock bluffs set in a mosaic of steep tussock, low subalpine herbs and small woody species, and small, steep screes of fine material. This area contributes considerable habitat diversity to the higher altitudes of the PL. Other screes of limited extent, often featuring high quantities of fine material, occur in gully heads further to the east.

In the middle altitudes, introduced grasses have established between the tussocks to a variable extent, but the latter still maintain a good cover over large areas, with many grassland invertebrates present. Recent disturbance (e.g. burning), appears to be limited in extent. Rocky faces occur at this level in a number of sites.

The lower valley sides and valley floors generally display increasing dominance of introduced pasture species. However, remnant woodlands are often present in steep, rocky gullies, with a good diversity of tree, liane and shrub species. These sites were observed to have thriving populations of shade and humidity seeking species such as tipulids and other smaller Diptera, along with other woodland species. These sites are often associated with both shaded and exposed rocky bluff habitats.

Drainage from the steep, broken country below Conical Peak feeds the head of the MBWR. The main valley floor below this area, along the southwest edge of Marble Face block, features a large active shingle flat over 2km long and up to 150m wide, which forms a major, dynamic landform. The flat has extensive bare gravel and mosaics of mat-forming *Raoulia* and other species. These have a typical stream flat fauna of predatory robber flies, stiletto flies, parasitic tachinids and other Diptera, small bugs and carabid beetles, a variety of shingle flat spiders and so on. In the appropriate season it will almost certainly feature other river flat species such as cicadas and tiger beetles. On slightly raised ground, large areas with *Muehlenbeckia axillaris* and other native and introduced herbs support large populations of boulder copper and little blue butterflies. The northwest edge of this flat is frequently marked with steep rocky faces with occasional small patches of woody vegetation. Some of these have shady damp areas where water seepages support wetter vegetation, with many Diptera and other small insects present. The southwest side of the flat comprises gently sloping ground with occasional small, boggy flushes and some larger boggy patches associated with side streams, which add to the diversity of invertebrate habitat.

## **Invertebrate fauna**

The selection of species collected or observed is contained in Appendix 2. The assemblage of insect species observed/collected helps to characterise the area and reflects the variety of habitats present. The assemblage displays a full range of trophic levels, including both generalist and specialist species, indicating the existence of intact, functioning invertebrate communities. The species identified consist largely of those with lowland to montane distribution, but include species normally found at higher montane to subalpine altitudes. Species distributions range from endemic to or centred on Otago, to being more widely distributed.

### **2.6.2 Significance of the invertebrate fauna and habitats**

The PL is noteworthy for lying across the boundary of two EDs. It is of particular interest in being largely within a lowland to montane altitudinal range, substantially lower than much of the nearby Kakanui Mountains, but also containing sites with significant subalpine character. This is reflected to a degree in the species collected. The fine condition of much of the habitat, especially at higher altitudes, is noteworthy and was reflected in the large diurnal fauna observed.

Of special note is the sequence of habitats displayed in the Marble Face block, from low subalpine around Conical Peak down to the braided shingle flats of the upper MBWR. The sequence from ridge top to valley floor retains significant natural character throughout despite the presence of adventive/introduced plant species on the mid-lower slopes of the faces. As a land system this sequence is a single unit. The gravels of the flats are predominantly replenished from the steep slopes and faces below Conical Peak. The unit provides a complete example of this dynamic habitat with its specialised invertebrate community.

The forest stands in the gullies are refuges of communities which would once have been much more widespread in the district. They are sufficiently large to hold good representations of their associated invertebrate faunas.

### **2.6.3 Herpetofauna**

**“Site locations of rare and endangered herpetofauna are recorded in the original report. Herpetofauna of this nature is at risk of illegal activities including damage and removal through unlawful interference and disturbance. Accordingly, information regarding the locations of any such herpetofauna has been deleted from this version of the report. The Department of Conservation has put in place mechanisms to ensure that such information can be released for genuine scientific and research purposes. Please contact the Department of Conservation directly to determine whether the information can be released.”**

During the inspection the weather was fine and lizard activity high. Survey techniques used included scanning suitable habitat, looking in rock crevices and lifting rocks. Intermittent searches were conducted the following day at lower altitude sites. Good coverage of tussock grassland and scree habitat was achieved, but opportunity for searching shrubland and forest habitat was limited. Abundance and diversity of lizard fauna was variable and likely reflects the degree of modification of surrounding habitat.

No previous lizard surveys of the PL are known although, historically, a lizard community of up to eight species may have been present (Whitaker *et al.* 2002). The herpetofauna database contains a record of *Hoplodactylus maculatus* from approximately 6km north of the lease. In addition, a gecko in the *H. maculatus* complex, *Oligosoma maccanni* and *Naultinus gemmeus* (jewelled gecko) were all located on the neighbouring Glencoe PL during a tenure review inspection. On Shag Valley PL particularly good lizard abundance was recorded in the vicinity of Conical Peak and on spurs extending from the northern PL boundary. Sightings adjacent to the MBWR were also made. These observations indicate the presence of varied lizard habitat at a range of altitudes on the PL. In these blocks, shrubland and forest refuges within gullies represents further potential habitat. Intact lizard refuge sites were also present beyond these key areas throughout the PL.

The following species were recorded on Shag Valley PL:

- McCann's skinks (*Oligosoma maccanni*) were seen throughout the PL, inhabiting both tall and short tussock areas, including highly modified sites.
- Common skinks (*O. nigriplantare polychroma*) were only found on the river flats adjoining the MBWR at the western end of the PL. They are likely, however, to be widely distributed in suitable habitat throughout the PL.
- A gecko within the *Hoplodactylus maculatus* complex was found on the PL. This is believed to be *H. "Otago/Southland Large"* (Hitchmough 1997, Whitaker *et al.* 2002). These were numerous in the area near Conical Peak and were also found on blocky scree adjacent to the MBWR at the western end of the PL (Appendix 3). This gecko is likely to be more widely distributed on the PL, especially throughout the Marble Face and Mt Fortune blocks, where suitable intact habitat was abundant.

Habitat type and previous records within the Dansey and Waianakarua ED's suggest the following species may also be present on the PL although none were either confirmed or sighted during the current survey. These include:

- Cryptic skink (*Oligosoma inconspicuum*) usually inhabits damp microsites in grassland, herbfield or open shrubland (Whitaker *et al.* 2002). Such habitat was patchy in its distribution on the PL and usually within relatively degraded and modified habitat. As no cryptic skink were seen during the inspection the presence of this skink on the PL remains uncertain.
- The green skink (*O. chloronoton*) is known from approximately 25 km away in the Kakanui Mountains on rocky slopes and boulder banks within grassland

- The jewelled gecko (*Naultinus gemmeus*) is known from the Waianakarua ED (Whitaker et al. 2002), including on a neighbouring property. Suitable habitat was recorded within gullies in the Marble Face and Mt Fortune blocks.

#### 2.6.4 Significance of Herpetofauna

McCann's skink (*Oligosoma maccanni*) and common skink (*O. nigriplantare polychroma*) are common through the ED's and beyond. Both are listed as not threatened by Hitchmough (2002) and of low conservation status in Otago (Whitaker et al. 2002).

*Hoplodactylus* "Otago/Southland Large" has a threat ranking of gradual decline (Hitchmough 2002) and is of moderate conservation status in Otago (Whitaker et al. 2002). The Kakanui Mountains and Horse Range are the northern distributional limit for this species.

Currently the lizard fauna is locally common. Predation and habitat modification represent the greatest threats to abundance and diversity of the lizard populations present.

#### 2.6.5 Avian Fauna

Twelve bird species were observed during the inspection, of which eight were native species (Table 1). A harrier nest with two chicks was seen in tussock grassland in the Marble Face block. Falcons were seen patrolling the main ridge near Conical Peak and a falcon was observed feeding its young in bluffs above a forested gully in Mt Fortune block.

Table 1: Bird species recorded on Shag Valley PL. Exotic species are denoted by an asterisk.

Species	Common name
<i>Alauda arvensis</i> *	Skylark
<i>Anthornis melanura</i>	Bellbird
<i>Anthus novaeseelandiae</i>	New Zealand pipit
<i>Circus approximans</i>	Harrier
<i>Falco novaeseelandiae</i>	New Zealand falcon (eastern)
<i>Fringilla coelebs</i> *	Chaffinch
<i>Gerygone igata</i>	Grey warbler
<i>Hirundo tahitica</i>	Welcome swallow
<i>Petroica macrocephala</i>	Tomtit
<i>Tadorna variegata</i>	Paradise shelduck
<i>Turdus merula</i> *	Blackbird
<i>Turdus philomelos</i> *	Thrush

#### 2.6.6 Significance of avian fauna

Falcon "eastern" (*Falco novaeseelandiae*) has a threatened ranking of gradual decline

(Hitchmough, 2002).

### 2.6.7 Aquatic fauna

No previous freshwater fish records were found for Shag Valley PL on the New Zealand Freshwater Fish Database maintained by the National Institute of Water and Atmospheric Research (NIWA).

Two streams within the PL form part of the Waianakarua catchment. The MBWR is the larger stream, while the other is a tributary of the SBWR.

Eleven sites were inspected (Appendix 4), a number of which were dry. Those sites with water were surveyed using a Kainga 300 backpack electric fishing machine. Habitat measurements were taken and recorded based on a NIWA freshwater fish data form. In-stream invertebrates were noted when they could be identified, but no specific collection was undertaken.

Selected sites contained both riffle/run and pool habitat. All sites were a minimum of 50m in length or 100 m<sup>2</sup>. Width, depth, water temperature and conductivity were recorded. Substrate/riparian composition were visually estimated according to a Freshwater Fish Database Form format. The location was recorded using a handheld Global Positioning System (GPS).

In-stream invertebrates were noted and given an MCI<sup>1</sup> value when they could be identified during electric fishing surveys. Rocks were looked under but no “kick” sampling was undertaken. No attempt was made to carry out a site score due to the difficulty in identifying some of the invertebrates.

Three fish species, all native, were found. These were upland bully (*Gobiomorphus breviceps*), longfin eel (*Anguilla dieffenbachia*) and Canterbury galaxias (*Galaxias vulgaris*). Upland bully were found in a tributary of the SBWR Branch, Canterbury galaxias in the MBWR and longfin eel in both streams. Twelve taxa (Appendix 5) of invertebrates were located within the PL most having a high MCI value and indicative of high water quality. The presence of New Zealand’s only burrowing mayfly (*Ichthybotus hudsoni*) in the MBWR was a notable find.

### 2.6.8 Significance of aquatic fauna

Previous genetic examination of galaxiid populations in the Waianakarua River has confirmed these are Canterbury galaxias (*Galaxias vulgaris*). This species is not currently of conservation concern, although recent work indicates Canterbury galaxias is more restricted in distribution than was previously thought. The species was

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<sup>1</sup> The MCI is commonly used as an indicator of water quality in New Zealand stony streams. In its simplest, non-quantitative form the index is calculated by summing the tolerance scores of all taxa collected at site, graded from 1-10, dividing by the number of scoring taxa, and multiplying this average value by 20

previously thought to be wide spread throughout the north (now being questioned) and east of the South Island and found as far south as the Waitaki River and along the coast to the Kakanui Mountains. Significant genetic variation also occurs between population groups of this species.

Longfin eel (*Anguilla dieffenbachii*) is of conservation concern and has a ranking of gradual decline (Hitchmough, 2002). Habitat protection is a regional priority. This species was once abundant throughout New Zealand. Habitat modification and hydro dams which inhibit passage to and from the sea have led to the decline of this species.

The burrowing mayfly (*Ichthybotus hudsoni*) is rare in the south and this find indicates an extension of its southern range. This mayfly is usually only found in pristine upper catchment streams and so is an indicator of very high water quality.

### **2.6.9 Problem animals**

No pest animals were seen, but rabbits (*Oryctolagus cuniculus*), hares (*Lepus europaeus*), possums (*Trichosurus vulpecula*), feral cats (*Felis catus*), ferrets (*Mustela furo*), stoats (*Mustela erminea*), hedgehogs (*Erinaceus europaeus*) and rats (*Rattus* spp.) are probably present throughout the PL. These undoubtedly reduce populations of palatable native plants and native birds, reptiles and invertebrates. Grazing was noted on plants of *Gingidia* sp. aff. *montana* in a few areas where it was accessible to stock.

## **2.7 Historic**

No sites of historic significance have been identified on the Shag Valley PL.

## **2.8 Public Recreation**

### **2.8.1 Physical Characteristics**

Shag Valley PL provides varied recreational terrain including high ridges, braided river flats, rounded colluvial slopes and steep bluffs. Tracks along high ridgelines provide extensive views of the surrounding region and particularly toward the Kakanui Mountains. The PL provides physical links from the adjacent Waianakarua Scenic Reserve to the Horse Range and Kakanui Mountains beyond. The PL also provides opportunities for extended walk-in routes through the Waianakarua Scenic Reserve, identified as a priority for the area in the Otago CMS.

In 1992 DOC compiled a Recreation Opportunity Spectrum for the Otago Conservancy whereby all areas, regardless of land tenure, were classified and mapped according to setting, activity and recreational experience characteristics (Harper, 1992). The majority of the lease is zoned 'Backcountry 4x4 drive-in' which is characterised by "a feeling of relative remoteness from populated areas". The highly natural setting is a valued part of the experience and may be associated with motivations of "escape from town, education and nature appreciation. Four wheel drive vehicles provide ready access to the Kakanui Mountains.

The northeast extremity of the lease is zoned '*Backcountry Walk In* where the opportunity is characterised by a feeling of relative remoteness from populated areas. The highly natural setting is a valued part of the experience and may be associated with motivations of "escape from town", education, exercise and/or a sense of being close to nature. Access, although relatively close to other areas of high visitation, is only possible on foot and is often associated with tramping tracks or routes. This area lies along the western boundary of the Waianakarua Scenic Reserve.



### **2.8.2 Legal Access**

Legal access to the PL is via a formed track which crosses Kinross Station and corresponds with a legal road which reaches the lease boundary just south of spot height 715m at ~ GR I42 185 442.

Legal access, of unknown practicability, also exists to the SE extremity of the PL near the yards (GR I42 250 398). An unformed legal road exists on the true right of the SBWR extending from the junction of the SBWR and the formed legal Sweetwater Creek Road which runs off SH85.

### **2.8.3 Activities**

Important recreation routes are shown on map 4.2.3. Recreational activities in the area of the PL include the following.

- Hunting, mainly wild pigs.
- Opportunities for extended tramping in the wider Kakanui Mountains originating from the adjacent Waianakarua Scenic Reserve.
- Traverse of the Horse Range and trips by foot, horse and mountain bike further into the Kakanui Mountains.

## **PART 3**

### **OTHER RELEVANT MATTERS & PLANS**

#### **3.1 Consultation**

The following comments were made at the early warning meetings with NGO's in Alexandra on 24/9/03 and 12/05/04.

##### **FEDERATED MOUNTAIN CLUBS (FMC)**

- The lease has considerable recreational values, providing good access to Mt Miserable and Conical Peak. This access contributes to a possible Horse Range traverse, from the Pigroot Highway to Mt Miserable.
- Headwaters of Waianakarua River have significant landscape value.
- Shag Valley and its surrounds have great potential for walking opportunities in close proximity to Palmerston.

FMC also made a written submission (Appendix 6). Key points of their report are listed below

- Greatest recreational value of Shag Valley PL is as access along the Horse Range to the Waianakarua River and eventually to a traverse of the Kakanui Mountains.
- Proximity to Kinross Station and Glencoe Station is significant.
- Landscapes and view from Horse Range and Conical Peak add greatly to the experience of traversing Shag Valley PL.
- Considerable potential exists for increasing recreational use of Horse Range for tramping, mountain bike and horse riding and by hunters.
- Formal public access along the Horse Range needs to be established through tenure review. Formal recognition of the actual road formation as legal alignment and easements established for MTB and horse riding and tramping access.
- Long term a traverse of the Horse Range including the section over Shag Valley PL would be an essential component of a possible coast to coast traverse starting at Katiki beach or Trotters Gorge.
- A small area in the vicinity of Conical Peak has significant landscape and natural values and should be returned to the Crown.
- Provisions of the Shag Valley tenure review process must be considered in context of the outcomes of tenure review of Kinross PL

- Objectives for the Shag Point – Waianakarua Special Place could be significantly advanced by negotiation of good outcomes on Shag Valley and Glencoe PL.
- Access along ridges forming the northern and southern boundaries of Shag Valley Station an important issue for trampers.

#### PUBLIC ACCESS NEW ZEALAND (PANZ)

- The lease is part of a potential access route along the Horse Range. Such access should be secured either by retention of the area by the Crown or by a robust easement.
- The Horse Range, given its low altitude, is suitable for extensive recreational use e.g. horse trekking, cycling, tramping, day walks and mountain biking. Public access through Shag Valley should be secured to enable a traverse of the Horse Range/ Kakanui Mountains.

#### NEW ZEALAND DEERSTALKERS' ASSOCIATION (NZDA)

Written submissions were received from the Central Otago and North Otago branches and the National Office (Appendix 7). The three submissions were essentially similar in nature. The key points made were:

- Shag Valley PL is of interest for recreational hunting and NZDA wants to retain access to hunting opportunities.
- Recreational hunting provides a low cost wild animal control option.
- Vehicle access is requested to and within the property where formed tracks exist to facilitate effective hunting. Foot access is not adequate due to the extra time required to travel to the hunting area particularly for weekend hunters.

#### 4WD CLUB

- Dunedin and North Otago club use this area and the right to such use should continue in the future

### **3.2 Regional Policy Statements & Plans**

#### Regional Policy Statement

The Regional Policy Statement for Otago provides a policy framework for all of Otago's significant regional resource management issues. It does not contain rules. District Plans shall not be inconsistent with the Regional Policy Statement. In respect of natural values the Regional Policy Statement includes the following policy and method statement:

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

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

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

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

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

### Regional Plans

The whole PL is subject to the *Otago Regional Plan: Water* rule which requires resource consent for suction dredge mining.

### **3.3 District Plans**

The PL is located within the Rural Scenic and Rural General zones of the Waitaki District Plan. In general, the proposed Waitaki District Plan (amended to incorporate Council decisions) does not act as a trigger for the protection of tussock grasslands and smaller wetlands and forest areas. No indigenous vegetation clearance or exotic tree planting is allowed within 20 m of a water body or in any wetland. There are effectively no provisions that protect scenic values.

There are no registered archaeological sites, or areas of significant indigenous vegetation and habitat of significant indigenous fauna as set out in the appendices of the plan. Protection is limited to the controls set out above.

### **3.4 Conservation Management Strategies & Plans**

The Otago Conservancy of DOC has prepared a *Conservation Management Strategy* (CMS) which was approved by the New Zealand Conservation Authority in August 1998. The CMS identifies 41 special places of conservation interest in Otago Conservancy. The Shag Valley PI is incorporated in the Shag Point-Waianakarua Special Place.

The CMS objectives for the Shag Point- Waianakarua Special Place relevant to Shag Valley include:

*To link areas of more or less continuous indigenous vegetation in the Trotters Gorge-Pigeon Bush-Waianakarua area, by endeavouring to negotiate protection, and to improve the management of the natural resources of those areas (CMS:175).*

The key implementation methods relevant to Shag Valley PL are:

- Protected area boundaries will be rationalised by disposals, acquisitions, swaps and by other means to link as far as practicable the existing inland protected areas and areas of indigenous vegetation between them.
- Management of inland protected areas will be improved with emphasis on fencing, plant pest control, wild animal control and fire protection.
- The department ...may retain or create a small number of longer distance tracks or routes through the inland protected areas, in back country walk-in settings.
- In order to assist with the control of animal pests in the Waianakarua Scenic Reserve and adjoining protected areas, recreational access to and information about these areas will be improved and, if resources allow, a basic hut for overnight use will be constructed or permitted in an appropriate location.

Priorities for the Shag Point – Waianakarua Special Place are:

*Extending, rationalising and securing protected area boundaries (both coastal and inland) and improving ecosystem management and species habitats will be priorities in this Special Place.*

### **3.5 Other Strategies and Plans**

#### New Zealand Biodiversity Strategy

The New Zealand Government is a signatory to the Convention on Biological Diversity. In February 2000, Government released the *New Zealand Biodiversity Strategy* which is a blueprint for managing the country's diversity of species and habitats and sets a number of goals to achieve this aim. Of particular relevance to tenure review, is goal three which states:

*Maintain and restore a full range of remaining natural habitats and ecosystems to a healthy functioning state, enhance critically scarce habitats, and sustain the more modified ecosystems in production and urban environments, and do what is necessary to:-*

- *Maintain and restore viable populations of all indigenous species across their natural range and maintain their genetic diversity.*

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

**PART 4**

**MAPS, REFERENCES, APPENDICES ETC.**

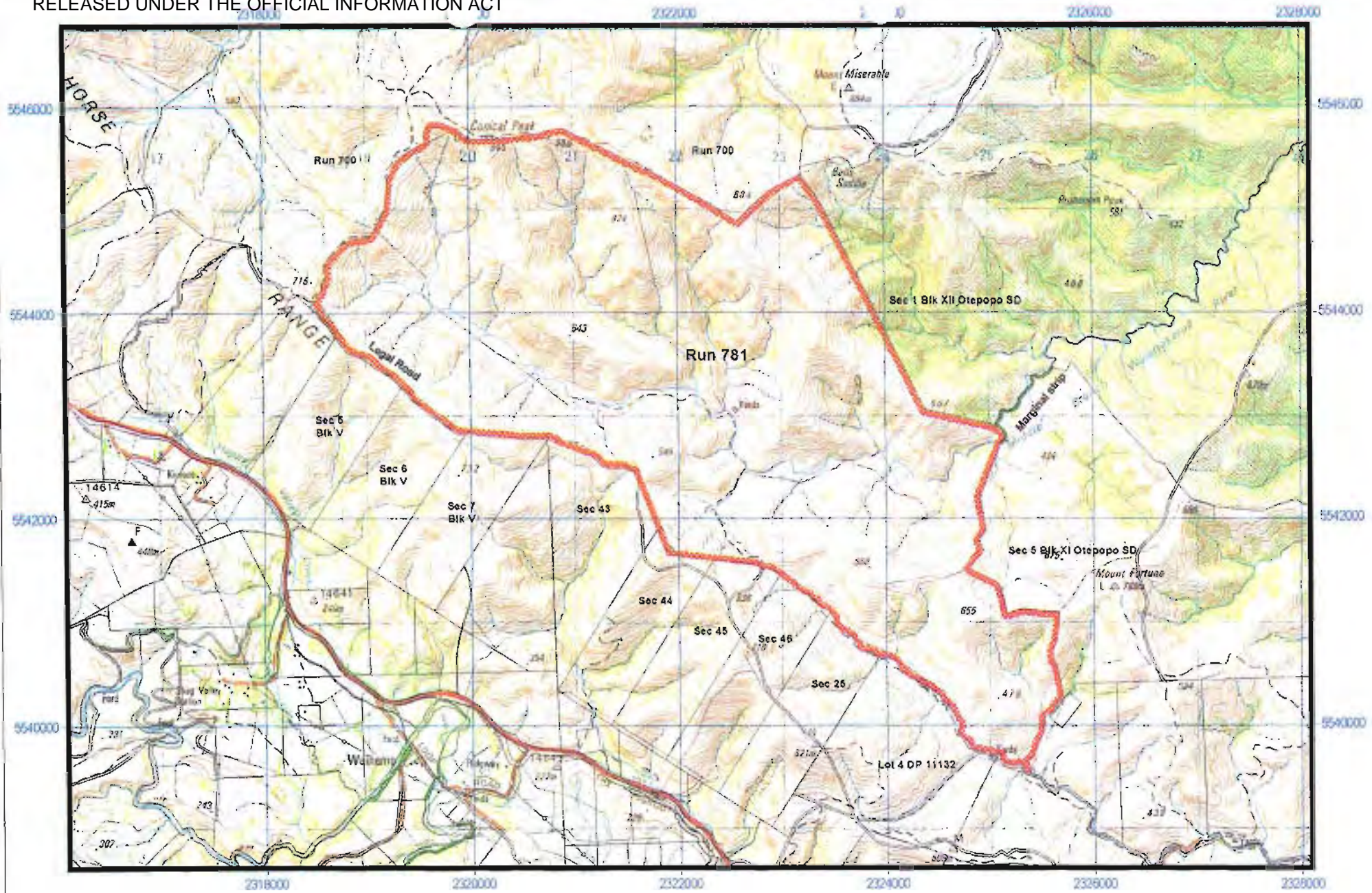
**4.1 References**

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## **4.2 Illustrative Maps**

- |       |                |                                |
|-------|----------------|--------------------------------|
| 4.2.1 | Shag Valley PL | Topo/Cadastral Map             |
| 4.2.2 | Shag Valley PL | Values – Landscape Units       |
| 4.2.3 | Shag Valley PL | Values – Ecological/Recreation |
| 4.2.4 | Shag Valley PL | Farm Block Titles              |





4.2.1 Topographical/ cadastral  
Shag Valley Station Pastoral Lease

Marginal strips.shp  
Estate.shp

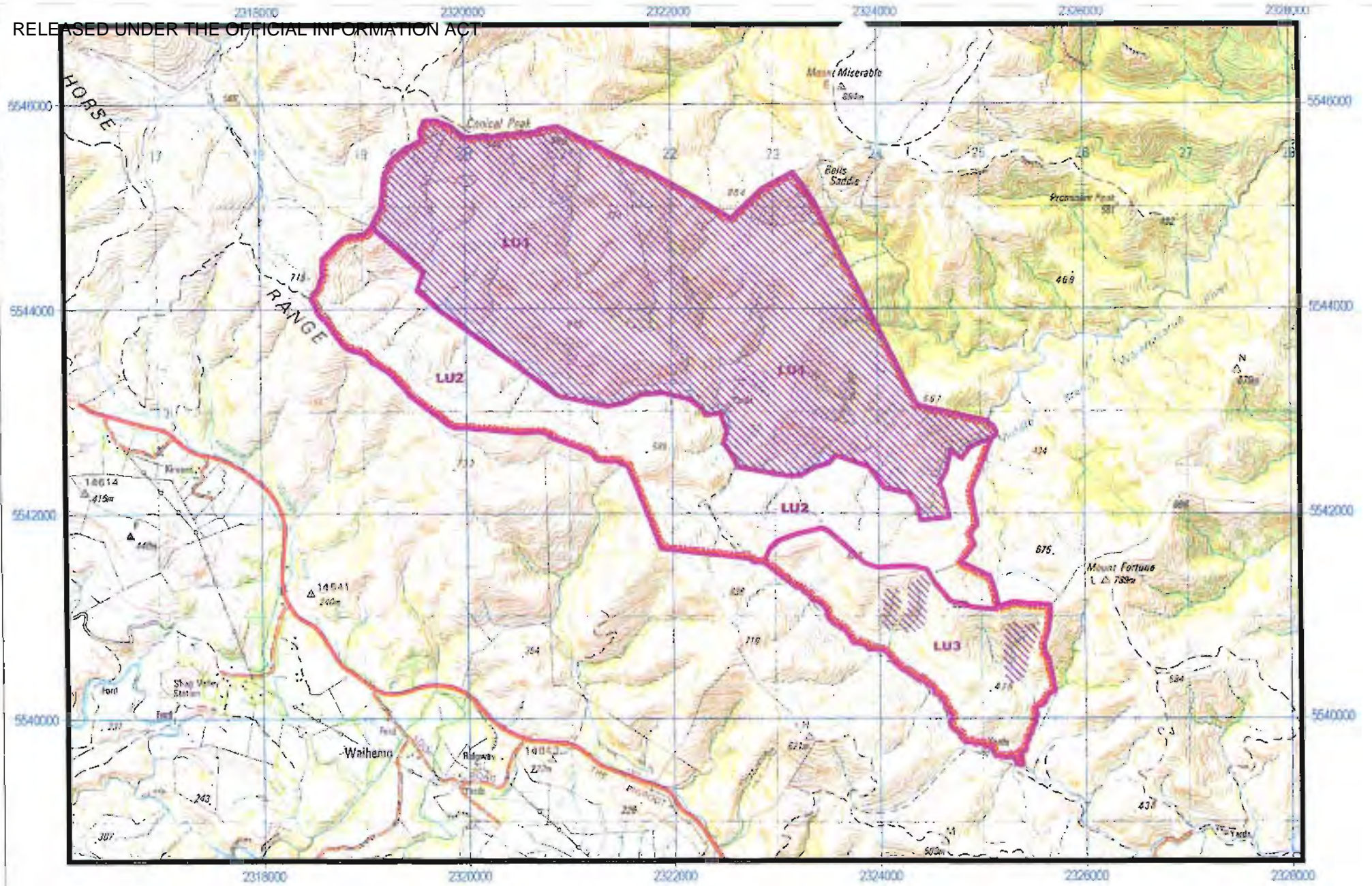
OTACO-370592; Shag Valley Pastoral Lease Conservation Resources Report





NZMS 260 - 142







4.2.2 Landscape units and Significant values  
 Shag Valley Station Pastoral Lease

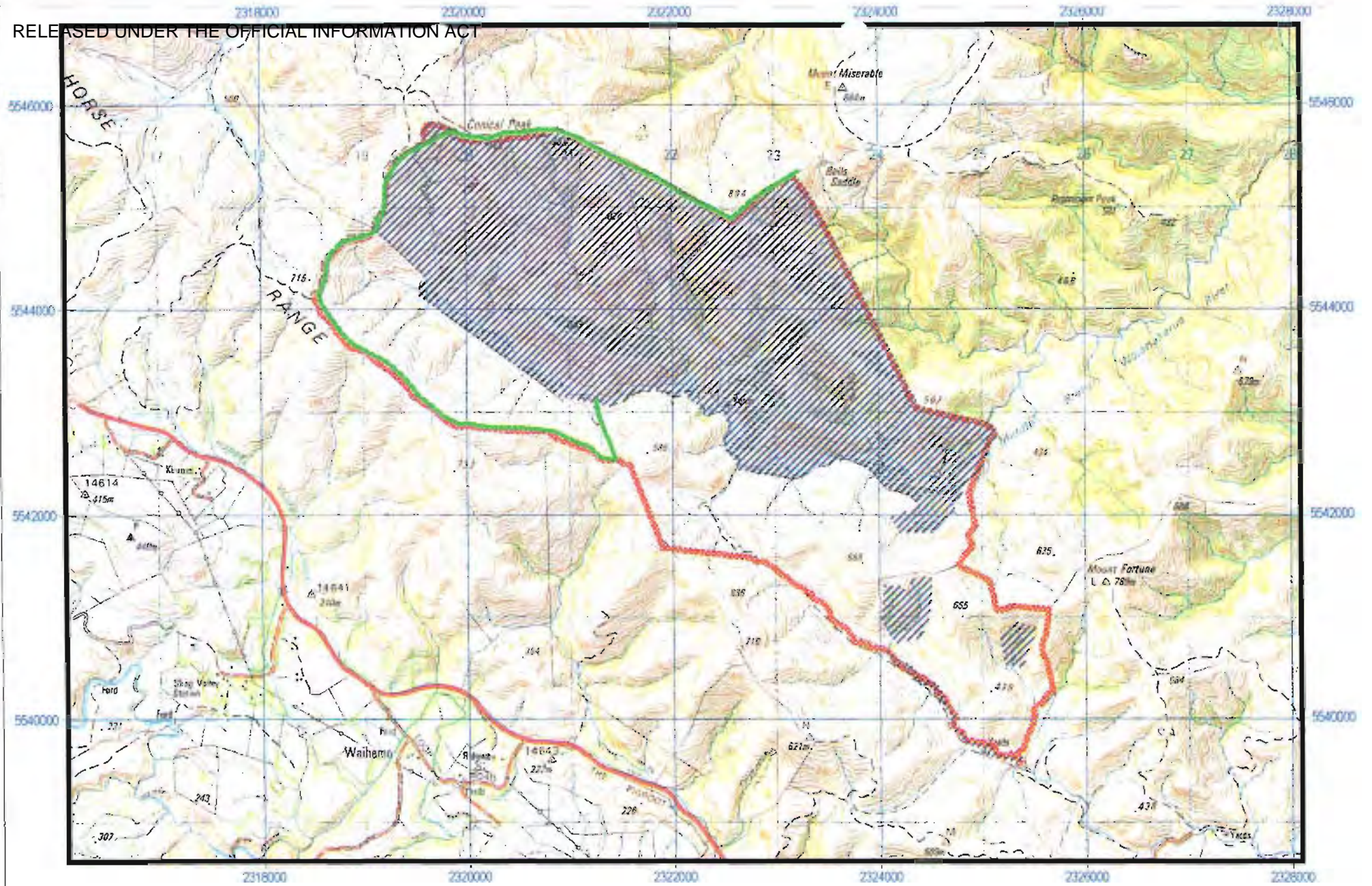
 Significant landscape values  
 Landscape unit boundaries

2000 0 2000 Meters



NZMS 260 - I 42







4.2.3 Values - Ecological/ Recreational  
Shag Valley Station Pastoral Lease

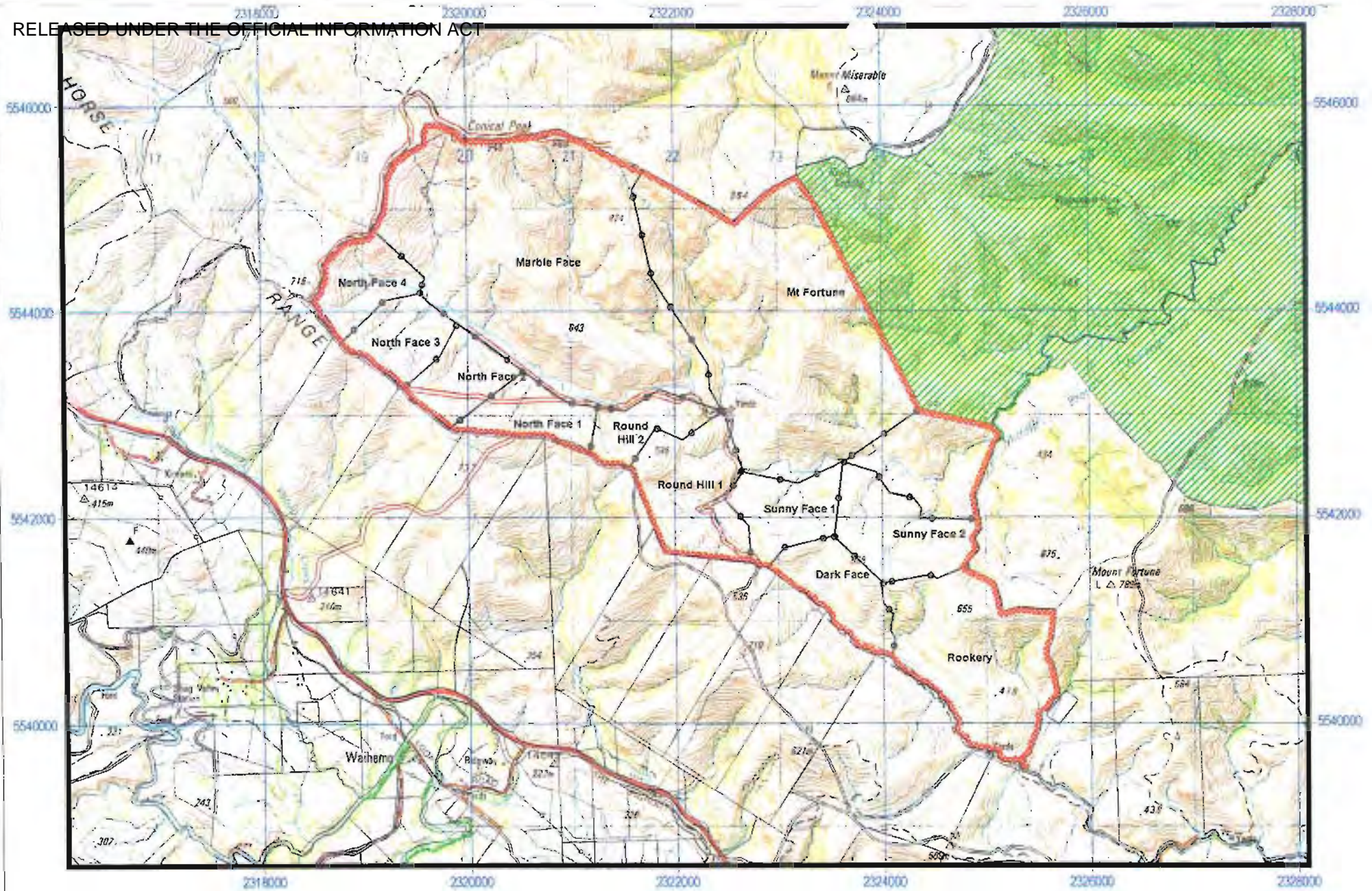
 Recreational routes  
 Significant ecological resources

2000 0 2000 Meters

NZMS 260 - 142







4.2.4 Named farm blocks  
Shag Valley Station Pastoral Lease

- Public lands
- Marginal strips
- Fences
- Tracks

2000 0 2000 Meters

NZMS 260 - I 42



### **4.3 Photographs**





Photo 1 Panorama incorporating most of the Marble Face Block and the Mt Fortune Block, taken from GR I42 207428



Photo 2: Looking down MBWR from GR I42 188 448 toward Round Hill Block and Sunny Face Block. The MBWR stony river flat is an uncommon habitat in eastern Otago.



Photo 3: Remnant riparian shrubland and snow tussockland at GR I42 214 431





Photo 4 (above) and Photo 5 (below):

Middle and upper sections of the Marble Face Block. Remnant shrublands (photo 4) and extensive rocky outcrops (photo 5) contribute significantly to the diversity of this area.







Photo 6 (above):

Looking north from GR I42 247415 into the southern portion of Mt Fortune Block. Note the remnant forest and shrubland in gullies and other fire/grazing refugia.



Photo 7 (right):

The lower sections of the Mt Fortune and an unnamed block below Sunny Face 2. Note the riparian shrubland. The extensive forested area is within the neighbouring Waianakarua Scenic Reserve.





Photo 8 (above) and Photo 9 (Below)

Forest remnants within the Rookery Block, centered on GR I42 258405 and 244412 respectively. Both remnants contain canopy species not recorded in the Marble Face Block and Mt Fortune Block forest remnants.





#### **4.4 Appendices**

- Appendix 1 Vascular plants recorded on Shag Valley PL.
- Appendix 2 List of invertebrate species from Shag Valley PL identified by Otago Museum and invertebrate specimens of note observed in or collected from Shag Valley PL, but not identified.
- Appendix 3 Lizards recorded on Shag Valley PL 11-12 December 2003.
- Appendix 4 Aquatic Fauna – Summary of data collected.
- Appendix 5 Invertebrates and MCI values (1-10).
- Appendix 6 Federated Mountain Clubs of NZ (Inc.) Written submission on Recreational and Related Significant Inherent Values.
- Appendix 7 New Zealand Deerstalkers' Association. Written submissions from
  - A) Central Otago Branch
  - B) North Otago Branch
  - C) National Association.

**APPENDIX 1** Vascular plants recorded on Shag Valley PL

Exotic species are denoted with an asterisk (\*).

Species	Common name	Plant type
<i>Acaena agnipila</i> *	Australian sheep's burr	Dicot herb
<i>Acaena anserinifolia</i>	Bidibidi	Dicot herb
<i>Acaena caesiiglauc</i>	Bidibidi	Dicot herb
<i>Acaena dumicola</i>	Bidibidi	Dicot herb
<i>Acaena inermis</i>	Bidibidi	Dicot herb
<i>Acaena juvenca</i>	Bidibidi	Dicot herb
<i>Acaena novae-zelandiae</i>	Bidibidi	Dicot herb
<i>Aciphylla aurea</i>	Golden spaniard	Dicot herb
<i>Aciphylla scott-thomsonii</i>	Spaniard	Dicot herb
<i>Agrostis capillaris</i> *	Browntop	Grass
<i>Aira caryophyllea</i> *		Grass
<i>Anaphalioides bellidiodes</i>		Dicot herb
<i>Anisotome brevistylis</i>		Dicot herb
<i>Anthoxanthum odoratum</i> *	Sweet vernal	Grass
<i>Aristotelia serrata</i>	Wineberry	Tree
<i>Asplenium appendiculatum</i>		Fern
<i>Asplenium bulbiferum</i>	Hen and chicken fern	Fern
<i>Asplenium flabellifolium</i>		Fern
<i>Asplenium hookerianum</i>		Fern
<i>Asplenium lyallii</i>		Fern
<i>Asplenium richardii</i>		Fern
<i>Astelia fragrans</i>		Monocot herb
<i>Blechnum chambersii</i>		Fern
<i>Blechnum novae-zelandiae</i>	Kiokio	Fern
<i>Blechnum penna-marina</i>		Fern
<i>Blechnum procerum</i>		Fern
<i>Brachyglottis lagopus</i>		Dicot herb
<i>Brachyscome sinclairii</i>		Dicot herb
<i>Bromus hordeaceus</i> *	Soft brome	Grass
<i>Bulbinella angustifolia</i>	Maori onion	Monocot herb
<i>Calystegia turguriorum</i>		Vine
<i>Capsella bursa-pastoris</i> *	Shepherds purse	Dicot herb
<i>Cardamine debilis</i>		Dicot herb
<i>Carduus nutans</i> *	Nodding thistle	Dicot herb
<i>Carduus tenuiflorus</i> *	Winged thistle	Dicot herb
<i>Carex breviculmis</i>		Sedge
<i>Carex buechananii</i>		Sedge
<i>Carex coriacea</i>	Rautahi	Sedge
<i>Carex flagellifera</i>		Sedge
<i>Carex forsteri</i>		Sedge
<i>Carex secta</i>	Purei	Tussock sedge
<i>Carex solandri</i>		Sedge
<i>Carmichaelia crassicaule</i>	Coral broom	Shrub
<i>Carmichaelia petriei</i>	Native broom	Shrub
<i>Carpodetus serratus</i>	Marble leaf	Tree
<i>Celmisia gracilent</i>		Dicot herb
<i>Celmisia hookeri</i>		Dicot herb
<i>Cerastium fontanum</i> *	Mouse-eared chickweed	Dicot herb
<i>Chionochloa conspicua</i>		Grass
<i>Chionochloa rigida</i>	Narrow-leaved snow tussock	Grass
<i>Clematis afoliata</i>		Vine
<i>Clematis marata</i>		Vine

Species	Common name	Plant type
<i>Clematis paniculata</i>		Vine
<i>Colobanthus strictus</i>		Dicot herb
<i>Coprosma crassifolia</i>		Shrub
<i>Coprosma propinqua</i>	Mikimiki	Shrub
<i>Coprosma rigida</i>		
<i>Coprosma rotundifolia</i>		Tree
<i>Coprosma rugosa</i>		Shrub
<i>Coprosma virescens</i>		Shrub
<i>Cordyline australis</i>	Cabbage tree	Tree
<i>Coriaria arborea</i>	Tutu	Shrub
<i>Cortaderia richardii</i>	Toetoe	Tussock grass
<i>Corybas macranthus</i>		Orchid
<i>Cystopteris tasmanica</i>		Fern
<i>Cytisus scoparius</i> *	Broom	Shrub
<i>Dactylis glomerata</i> *	Cocksfoot	Grass
<i>Digitalis purpurea</i> *	Foxglove	Dicot herb
<i>Discaria toumatou</i>	Matagouri	Shrub
<i>Dracophyllum uniflorum</i>	Turpentine shrub	Shrub
<i>Eleocharis acuta</i>	Sharp spike sedge	Sedge
<i>Elymus solandri</i>		Grass
<i>Epilobium brunnescens</i>		Dicot herb
<i>Epilobium microphyllum</i>		Dicot herb
<i>Epilobium pedunculare</i>		Dicot herb
<i>Festuca novae-zeelandiae</i>	Hard tussock	Grass
<i>Forstera tenella</i>		Dicot herb
<i>Fuchsia perscandens</i>		Vine
<i>Galium aparine</i> *	Cleavers	Dicot herb
<i>Gaultheria crassa</i>		Shrub
<i>Gaultheria macrostigma</i>		Subshrub
<i>Gentianella</i> sp.		Dicot herb
<i>Geranium microphyllum</i>		Dicot herb
<i>Geranium pusillum</i> *		Dicot herb
<i>Gingidia decipiens</i>		Dicot herb
<i>Gingidia</i> sp. aff. <i>montana</i>		Dicot herb
<i>Griselinia littoralis</i>	Broadleaf	Tree
<i>Hebe salicifolia</i>	Koromiko	Shrub
<i>Helichrysum intermedium</i>		Shrub
<i>Hieracium lepidulum</i> *	Tussock hawkweed	Dicot herb
<i>Hieracium pilosella</i> *	Mouse-eared hawkweed	Dicot herb
<i>Hoheria angustifolia</i>	Narrow-leaved lacebark	Tree
<i>Holcus lanatus</i> *	Yorkshire fog	Grass
<i>Hydrocotyle moschata</i>		Dicot herb
<i>Hydrocotyle novae-zeelandiae</i>		Dicot herb
<i>Hymenophyllum multifidum</i>		Fern
<i>Hypochaeris radicata</i> *	Catsear	Dicot herb
<i>Hypolepis millefolium</i>		Fern
<i>Isolepis setacea</i> *		Sedge
<i>Juncus articulatus</i> *	Jointed rush	Rush
<i>Juncus distegus</i>		Rush
<i>Juncus gregiflorus</i>		Rush
<i>Kelleria dieffenbachii</i>		Dicot herb
<i>Lagenifera cuneata</i>		Dicot herb
<i>Leptinella pectinata</i>		Dicot herb
<i>Leucopogon fraseri</i>	Patotara	Shrub
<i>Libertia ixioides</i>		Monocot herb
<i>Linum catharticum</i> *		Dicot herb

Species	Common name	Plant type
<i>Luzula rufa</i>		Sedge
<i>Lycopodium fastigiatum</i>		Fern
<i>Melicytus alpinus</i>	Porcupine shrub	Shrub
<i>Melicytus ramiflorus</i>	Mahoe	Tree
<i>Mentha cunninghamii</i>	Native mint	Dicot herb
<i>Microsorium pustulatum</i>	Hounds tongue fern	Fern
<i>Microtis unifolia</i>		Orchid
<i>Mimulus moschatus</i> *	Musk	Dicot herb
<i>Muehlenbeckia australis</i>	Pohuehue	Vine
<i>Muehlenbeckia axillaris</i>		Vine
<i>Muehlenbeckia complexa</i>	Pohuehue	Vine
<i>Myosotis discolor</i> *	Grassland forget-me-not	Dicot herb
<i>Myrsine australis</i>	Mapou	Tree
<i>Nasturtium microphyllum</i> *	Water cress	Dicot herb
<i>Olearia bullata</i>		Shrub
<i>Olearia lineata</i>		Tree
<i>Oreomyrrhis colensoi</i>		Dicot herb
<i>Oxalis exilis</i>		Dicot herb
<i>Oxalis lactea</i>		Dicot herb
<i>Ozothamnus leptophyllus</i>	Tauhinu	Shrub
<i>Pennantia corymbosa</i>	Kaikomako	Tree
<i>Pentachondra pumila</i>		Subshrub
<i>Phormium cookianum</i>	Mountain flax	Tussock herb
<i>Pimelea pseudolyalii</i>		Subshrub
<i>Pimelia oreophila</i>		Shrub
<i>Pinus contorta</i> *	Lodgepole pine	Tree
<i>Pittosporum eugenoides</i>	Lemonwood	Tree
<i>Pittosporum tenuifolium</i>	Kohuhu	Tree
<i>Plagianthus regius</i>	Lowland ribbonwood	Tree
<i>Poa annua</i> *	Annual poa	Grass
<i>Poa cita</i>	Silver tussock	Grass
<i>Poa colensoi</i>	Blue tussock	Grass
<i>Poa imbecilla</i>	Weak poa	Grass
<i>Polystichum neozelandicum</i> subsp. <i>zerophyllum</i>		Fern
<i>Polystichum vestitum</i>	Prickly shield fern	Fern
<i>Pseudopanax colensoi</i>	Five finger	Tree
<i>Pseudopanax crassifolium</i>	Lancewood	Tree
<i>Pteridium esculentum</i>	Bracken	Fern
<i>Pterostylis banksii</i>		Orchid
<i>Pterostylis</i> sp. aff. <i>montana</i>		Orchid
<i>Ranunculus glabrifolius</i>	Buttercup	Dicot herb
<i>Ranunculus membranifolius</i>	Buttercup	Dicot herb
<i>Ranunculus multiscapus</i>	Buttercup	Dicot herb
<i>Raoulia glabra</i>		Dicot herb
<i>Raoulia tenuicaulis</i>		Dicot herb
<i>Rubus cissoides</i>	Bush lawyer	Vine
<i>Rubus schmidelioides</i>	Lawyer	Vine
<i>Rumex acetosella</i> *	Sheep's sorrel	Dicot herb
<i>Rytidosperma pumilum</i>		Grass
<i>Sagina procumbens</i> *	Pearlwort	Dicot herb
<i>Sambucus nigra</i> *	Elder	Tree
<i>Scandia geniculata</i>		Vine
<i>Schoenus pauciflorus</i>		Sedge
<i>Sophora microphylla</i>	Kowhai	Tree
<i>Stellaria alsine</i> *	Bog stitchwort	Dicot herb

<b>Species</b>	<b>Common name</b>	<b>Plant type</b>
<i>Stellaria parviflora</i> *	Chickweed	Dicot herb
<i>Thelymitra</i> sp.	Sun orchid	Monocot herb
<i>Trifolium dubium</i> *	Suckling clover	Dicot herb
<i>Trifolium repens</i> *	White clover	Dicot herb
<i>Uncinia uncinata</i>	Hookgrass	Sedge
<i>Urtica ferox</i>	Tree nettle	Shrub
<i>Verbascum thapsus</i> *	Woolly mullein	Dicot herb
<i>Veronica serpyllifolia</i> *	Turf speedwell	Dicot herb
<i>Vulpia bromoides</i> *		Grass
<i>Wahlenbergia albomarginata</i>	Harebell	Dicot herb

**APPENDIX 2:** List of invertebrate species from Shag Valley PL identified by Otago Museum and invertebrate specimens of note observed in or collected from Shag Valley PL, but not identified.

<b>Order/Family</b>	<b>Species</b>	<b>Common name</b> (moths, butterflies)	<b>Distribution</b>	<b>Foods/habitat</b>
<b>Lepidoptera</b>				
Geometridae	Austrocidaria similata	carpet moth	widespread and common to montane zone	
	Helastia corcularia	slate moth	widespread and common to montane zone	
Satyridae	Argyrophenga janitae	tussock butterfly	local -eastern SI grasslands to montane - alpine zone	larvae on Chionochloa
Nymphalidae	Vanessa itea	yellow admiral	widespread and common to montane zone	larvae on nettles
Lycaenidae	common copper complex		population with large males	larvae on Muehlenbeckia to low alpine zone
	boulder copper complex		distinct n.sp from eastern North Otago	larvae on M. axillaris
Crambidae	Zizina oxleyi	blue butterfly	common & widespread in central & north Otago	larvae on clover & Carmichaelia
	Orocrambus crenaeus	grassmoth	common in alpine snow grass of Otago	
	Orocrambus flexuosellus	grassmoth	v common and widespread in native and exotic grasslands	lowland to montane zones
	Orocrambus aethonellus	grassmoth	locally common in damp grasslands to low alpine zone	
	Eudonia sabulosella	carpet moth	v common and widespread in native and exotic grasslands	open areas
	Eudonia leptolea	carpet moth	v common and widespread in native and exotic grasslands	open areas
	Eudonia chalara		common in low altitude grasslands	
Oecophoridae	Glaucoccharis auriscriptella		widespread and common to montane zone	larvae on mosses
	Gymnobathra parca	litter moth	widespread and common to montane zone	larvae on leaf litter
<b>Orthoptera</b>				
Acrididae	Sigauss australis	alpine	common and widespread in montane-alpine	

		grasshopper (beetles)	grasslands	
<b>Coleoptera</b>				
Tenebrionidae	Mimopeus opaculus	darkling beetle	common & widespread in central & north Otago	
Carabidae	Megadromus meritus		widespread and common to montane zone	
	Mecodema sculpturatum	carabid beetle	common & widespread to low alpine zone in Otago	
Cerambycidae	Gastrosaris nigrocollis	longhorn	local wasp mimic longhorn	larvae in dead wood
<b>Dermoptera</b>		(earwigs)		
	Forficula auricularia	earwig	common and widespread mostly lowland areas	introduced species
<b>Hymenoptera</b>		(wasps)		
Pompilidae	Procnemis nitidiventris	spider wasp	widespread in sandy areas to montane	

Invertebrate specimens of note observed in or collected from Shag Valley PL, but not identified include:

<b>Diptera</b> (true flies)	
Asilidae (robber flies)	one or more species. A large species was especially visible patrolling open shingle and sand flats of the large stream flat at the head of the MBWR. Individuals of possibly the same species occurred elsewhere, including along barer sections of ridges and in several valley floors.
Therevidae (stiletto flies)	Fast-moving therevids were present on the large stream flats, but eluded capture. A moderately large and distinctive unnamed species of <i>Anabarhynchus</i> was captured on the ridge west of Mt Fortune, at 650m. This species has been taken elsewhere from the Chain Hills west of Tarras (1480m, 850m) by E. Edwards and may be endemic in the South Canterbury/Otago area.
Tachinidae:	A number of species were noted, and some collected, during the survey. Especially numerous is a large, bulky species found throughout the higher altitude tussocks (? <i>Protohystricia</i> sp.). Small groups of this or a similar species were observed apparently chasing and harrying fast-flying yellow admiral butterflies along the ridge extending south from Bells Saddle. The larvae of tachinids are parasitic on other insects.
<b>Hemiptera</b> (bugs)	Bugs from a number of families were observed, and some caught, throughout the lease. These included several species inhabiting the large stream flat, both around the water's edge and on the bare gravels.
<b>Araneae</b> (spiders)	A wide range of species was observed throughout the lease.

**APPENDIX 3:** Lizards recorded on Shag Valley PL 11-12 December 2003

Records include only actual sightings, not other signs of presence such as droppings, movement and skin sheds.

**“Site locations of rare and endangered herpetofauna are recorded in the original report. Herpetofauna of this nature is at risk of illegal activities including damage and removal through unlawful interference and disturbance. Accordingly, information regarding the locations of any such herpetofauna has been deleted from this version of the report. The Department of Conservation has put in place mechanisms to ensure that such information can be released for genuine scientific and research purposes. Please contact the Department of Conservation directly to determine whether the information can be released.”**



**APPENDIX 4** Aquatic Fauna - Summary of data collected

Location	Water Present	Fish species	Invertebrates
2321900/5543700	Yes	Canterbury galaxias	<b>Mayflies;</b> <i>Deleatidium, Coloburiscus</i> <b>Caddisflies;</b> <i>Olinga feredayi</i>
2322654/5542464	Yes	Canterbury galaxias	<b>Stoneflies;</b> <i>Zeandoperla</i> <b>Mayflies;</b> <i>Deleatidium</i>
2322190/5543166	Yes	Canterbury galaxias	<b>Stoneflies;</b> <i>Zeandoperla</i> <b>Mayflies;</b> <i>Deleatidium, Nesameletus, Coloburiscus, Oniscigaster, Ichthybotus</i> <b>Caddisflies;</b> <i>Pycnocentria, Aoteapsyche</i> <b>Miscellaneous;</b> <i>Potamopyrgus, Oligchaete</i>
2322400/5542145	Yes	Longfin eel, Canterbury galaxias	<b>Stoneflies;</b> <i>Zeandoperla</i> <b>Mayflies;</b> <i>Deleatidium, Coloburiscus</i> <b>Caddisflies;</b> <i>Olinga feredayi, Pycnocentria, Aoteapsyche Helicopsyche</i> <b>Miscellaneous;</b> <i>Potamopyrgus</i>
2323297/5541219	Yes	Canterbury galaxias	<b>Mayflies;</b> <i>Deleatidium, Oniscigaster</i> <b>Caddisflies;</b> <i>Pycnocentria, Helicopsyche</i> <b>Miscellaneous;</b> <i>Potamopyrgus, Oligchaete</i>
2324865/5539772	Yes	Longfin eel, Canterbury galaxias, Upland bully	<b>Stoneflies;</b> <i>Stenoperla</i> <b>Caddisflies;</b> <i>Aoteapsyche, Pycnocentria, Olinga feredayi, Helicopsyche</i> <b>Mayflies;</b> <i>Deleatidium</i> <b>Miscellaneous;</b> <i>Potamopyrgus,</i>
2321000/5546000	No		
2319600/5546000	No		
2320300/5543700	No		
23194900/5544300	No		

**APPENDIX 5** Invertebrates and MCI values (1- 10)

<b>Stoneflies</b>	<b>MCI value</b>
<i>Stenoperla,</i>	10
<i>Zeandoperla,</i>	10
<b>Mayflies</b>	
<i>Deleatidium</i>	8
<i>Coloburiscus</i>	9
<i>Oniscigaster</i>	10
<i>Nesameletus</i>	9
<i>Ichthybotus</i>	8
<b>Caddisflies</b>	
<i>Aoteapsyche</i>	4
<i>Pycnocentridae</i>	7
<i>Olinga feredayi</i>	9
<i>Helicopsyche</i>	10
<b>Mollusca</b>	
<i>Potamopyrgus</i>	4

**APPENDIX 6** Federated Mountain Clubs of NZ (Inc.)

Written submission on Recreational and related significant inherent values.

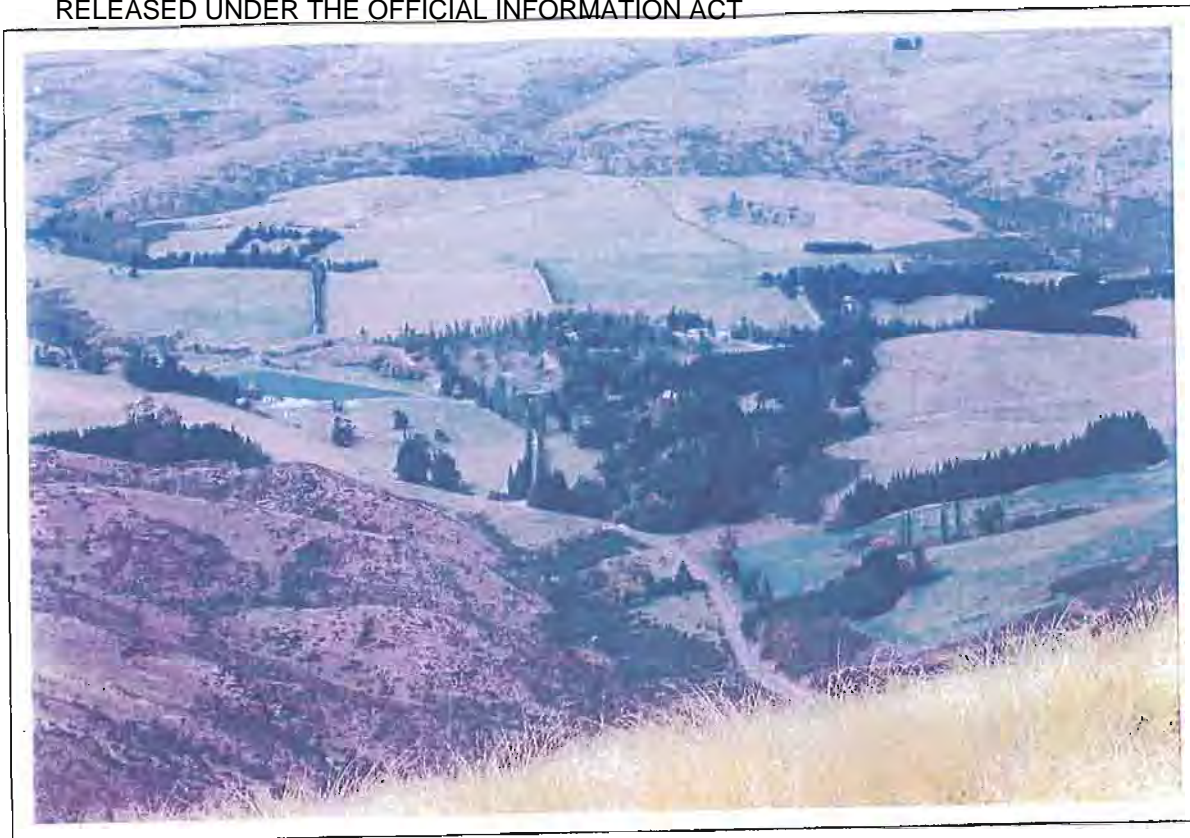


Fig. 1 This view is from about 700m on the Horse Range which forms the north western boundary of the pastoral lease and the divide between the Waianakarua and Shag River catchments. The Shag Valley Station homestead can be seen between the Pigroot highway (foreground) and the valley of the Shag River beyond the paddocks. The pastoral lease is run in conjunction with a significant area of freehold land around the homestead.



Fig. 2 The boundary between Shag Valley Station (on the extreme right) and Kinross (on the left) follows the divide between the Middle and North Branches of the Waianakarua River. This divide runs along the ridge to the right of the track which leads to Bells Saddle and Mt Miserable (on Glencoe Run). Public access along this track is needed but it is on Kinross land. This view is looking almost due east out to the North Otago sea coast.





Fig. 3 This view shows the contrast between the steep and heavily forested Waianakarua Scenic Reserve and the gently rolling pastureland on Glencoe Run to the north of the Reserve. Shag Valley Station borders the south side of the Reserve, which is administered by DOC. The reserve is well used for recreation and there is scope for trips out of the Reserve and along the northern boundary of Shag Valley, or along the Horse Range.



Fig. 4 Looking down the catchment of the Middle Branch of the Waianakarua River towards Mt Fortune. The soils in this catchment are mainly Hurunui Lowland Yellow Brown Earths, classified LUC Class VI with moderate limitations for pastoral use. It is probable that with appropriate pasture maintenance and fertiliser use, the land can be managed in an ecologically sustainable way and may therefore be suitable to be freeholded.





**Fig. 5** Shag Valley pastoral lease also includes the land on the true left of the South Branch of the Waianakarua River. This view is looking down the South Branch towards the southern end of the property. This valley includes some of the more developed pastures which have been highly modified from the original tussock grassland on Hurunui Lowland Yellow Brown Earth soils.



**Fig. 6** Conical Peak (extreme left) is the highest point on Shag Valley Station at almost 1,000m. It is surrounded by a relatively small area of Kaikoura Steepland High Country Yellow Brown Earth soils which are classified LUC Class VIII, with severe limitations for pastoral use. It is unlikely such land could be managed in an ecologically sustainable manner, and it is more appropriate to consider the inherent natural and landscape values of this area. The views from Conical Peak are expansive.





Fig. 7 A legal road runs along the crest of the Horse Range, leading towards the Kakanui. Although not much used for recreation at present, this could become more popular in future and there is a possibility of a 'coast-to-coast' route which would include the Razor-back and Horse Ranges, and the Kakanui Mountains. It is therefore important to secure access along that part of the route which runs along the south-western boundary of Shag Valley Station during this tenure review.



Fig. 8 Although the recreational use of most of the Horse Range has been light in the past, the area near Trotters Gorge gets much heavier use. It is easily accessible, has a hut in the gorge, and is close to spectacular landforms and scenery. Here trampers on a day trip are returning from the tops to the hut in the valley. It is likely that the Horse Range will become more popular in the future.





Fig. 9 Day walkers are here enjoying the rugged country in the Waianakarua Scenic Reserve, as they head down towards Prominent Peak. Opportunities could be greatly extended beyond the boundaries of the Reserve if access were made available through Bells Saddle, and along the ridge and down to the Waianakarua River ford.



Fig. 10 The track along the Kinross – Shag Valley boundary leads to a junction, from which a steep descent can be made (dotted line, over Kinross land) to a ford over the North Branch of the Waianakarua River. Beyond the crossing, the slopes on Mt Stalker pastoral lease lead to a wide range of recreational destinations on the ‘Hectors Plateau’ and the Kakanui Mountains. Some of these options have been discussed in other FMC tenure review Reports and this highlights the need to take a broad view of emerging recreational opportunities as tenure review proceeds.



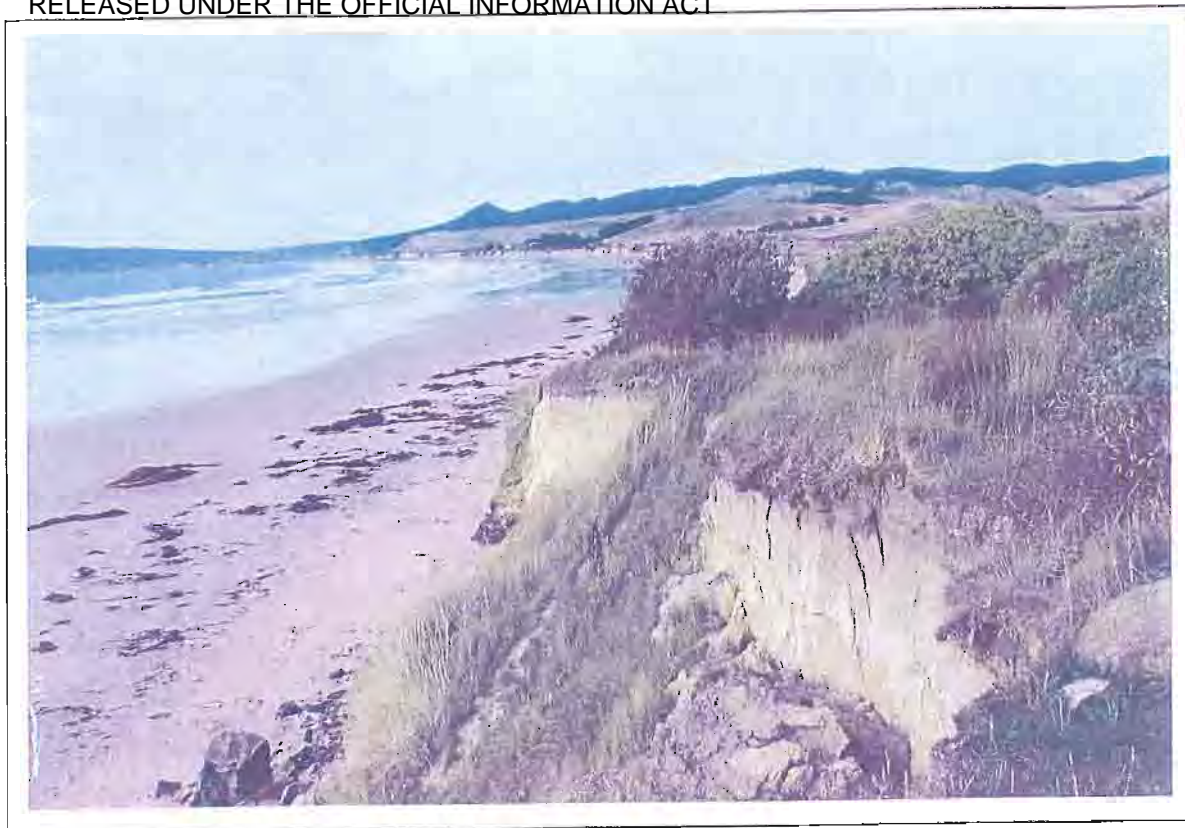


Fig. 11 Katiki Beach could be the starting point for a new and exciting long distance 'coast-to-coast' route which would include much of the distant skyline seen in this view. It is important that a wide view of each individual tenure review is taken so that provision can be made for public access over an emerging network of recreational opportunities (including long distance routes) as each pastoral lease is reviewed.



Fig. 12 This view shows the skyline crest of the Horse Range which occupies a key position along the possible long distance 'coast-to-coast' route which would include Trotters Gorge, the Razorback and Horse Ranges, and the Kakanui Mountains. It will be important during the present tenure review to secure public access along that section of the route which traverses Shag Valley Station.



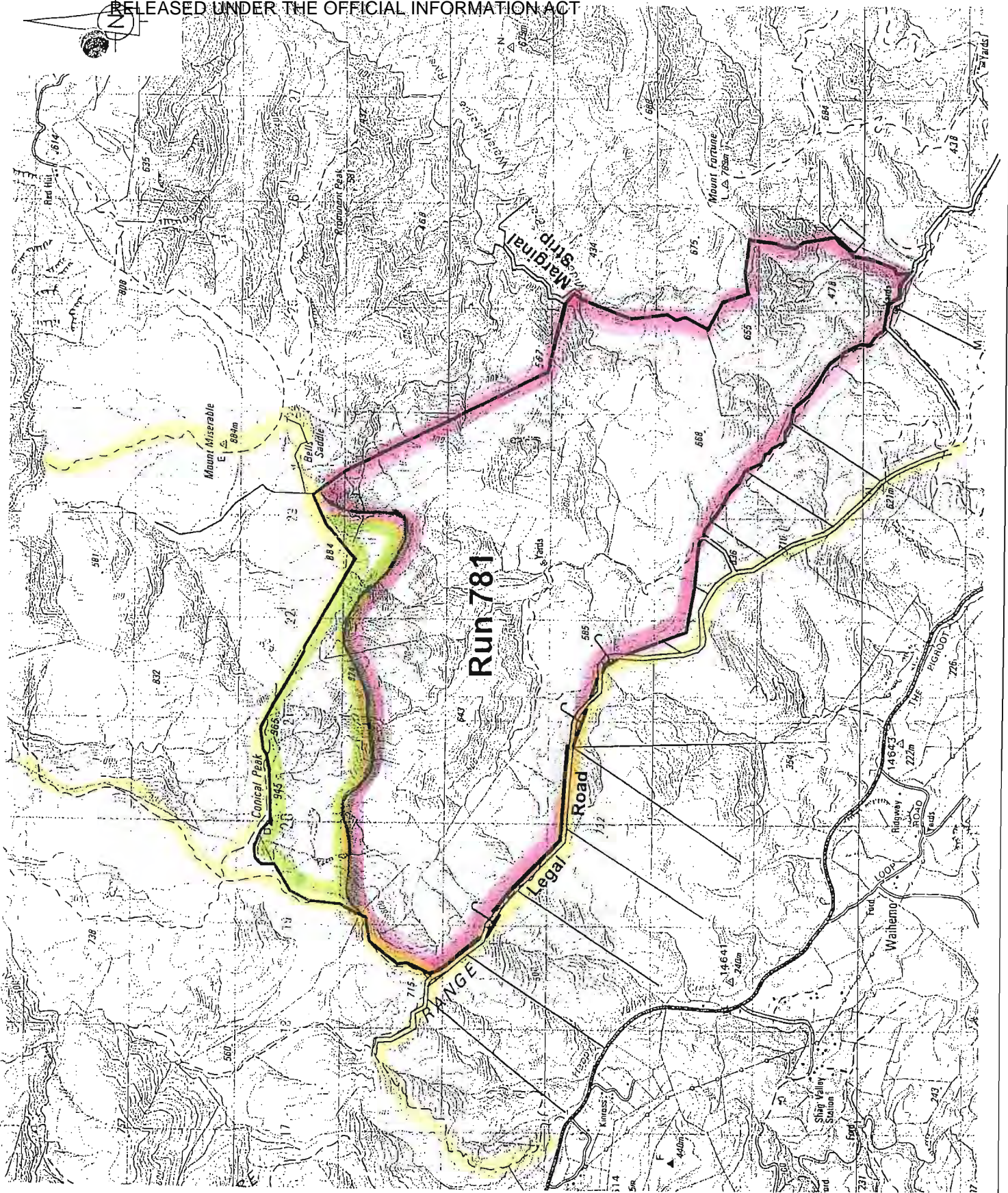


Fig. 13 On-site inspection of Shag Valley revealed some interesting remnant shrublands and areas of scrub which have potential to revert to their former ecological glory if protected from grazing and burning. Within a probable freehold area, the most appropriate form of protection is likely to be under a binding covenant registered on the freehold title. This remnant is in a steep sided gully not far from the yards in the Middle Branch of the Waianakarua River.



Fig. 14 There is a relatively small area of Kaikoura Steepland soils (LUC Class VIIe) in the vicinity of Conical Peak (C) and extending along the ridge towards Bells Saddle (S) which is unlikely to be capable of sustainable pastoral use. However, this area also has significant inherent landscape value and the tussock grassland has recovery potential in the absence of grazing and burning. This area should be returned to full Crown ownership and control to be managed for conservation and recreation.  
OTACO-370592; Shag Valley Pastoral Lease Conservation Resources Report





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Otago Land District	Sheet 1 of 1				
NZMS 260 1.42	Date 12/02/2002				

## Shag Valley Station

Scale 1 : 50000

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TL Survey Services Ltd DUNEDIN



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