

Crown Pastoral Land Tenure Review

Lease name : CAITHNESS

Lease number : PO 355

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.

January 06

**DOC CONSERVATION RESOURCES REPORT ON
TENURE REVIEW OF
CAITHNESS PASTORAL LEASE (P 355)
UNDER PART 2 OF THE CROWN PASTORAL
LAND ACT 1998**



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PART 1 INTRODUCTION

The lessee of the Caithness Pastoral Lease has applied to the Commissioner of Crown Lands for a review of land tenure. This report describes the inherent conservation values present on the lease.

Caithness lease encompasses 2,211 ha¹ in east Otago in two discrete blocks. A 36 ha block to the west of State Highway 85, also known as The Pigroot, is the center of the farm operation and the location of all farm buildings. This area is not considered to have any significant inherent values (SIV's) and is not discussed further in this report. The main 2,175 ha block, to the east of SH 85, is therefore the sole focus of this report. This main block is referred to from this point as Caithness lease or the lease. Caithness lease is found on the NZMS 260 I42 'Dunback' map.

Caithness lease lies at the north end of the Horse Range, which separates the Kakanui Mountains from the lower Razorback Range. Collectively, these ranges form a major land divide which links the South Island high country with the coast, and separates the Otago and Canterbury regions. The lease extends from a lowland altitude of 345m near The Pigroot to a montane altitude of 932m at Trig C on the main Horse Range ridgeline. The lease encompasses portions of Green Valley, lower Otepopo Spur and Jimmys Creek. Jimmys Creek separates Otepopo Spur from both the Horse Range and the major headwater catchments of Green Valley Creek.

Caithness lease shares boundaries with Kinross lease to the southeast, Mt Stalker lease along Otepopo Spur to the east, The Dasher lease to the north, freehold land to the northwest and SH 85 borders the lease to the southwest. The Caithness lease is accessed from SH 85 and a series of bulldozed tracks provide internal access routes. The closest rural centre is Palmerston situated about 25km to the south.

Caithness lease lies within the Kakanui Ecological Region (ER) and within Dansey Ecological District (ED). A Protected Natural Areas Programme (PNAP) survey has been completed for the Dansey ED (Comrie 1992). No recommended areas for protection (RAPs) were identified on the lease.

This report describes the conservation resources present on Caithness lease. The information is based primarily on the findings of an assessment team of 11 people who inspected the lease on 21st and 22nd February 2005. Weather conditions during the survey period were fine and warm. A further inspection to assess recreation values was made by three people on the 13th April 2005.

¹ Land areas used in this report are from the LINZ database and may vary from legal survey areas

<p>PART 2 INHERENT VALUES: DESCRIPTION OF CONSERVATION RESOURCES AND ASSESSMENT OF IMPORTANCE</p>
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2.1 Landscape

Methodology

The landscape assessment was made from The Pigroot and the network of access tracks within the lease. Three landscape units, based principally on water catchment areas, have been identified on the lease. The boundaries of the units and associated inherent values are indicated on Map 4.2.2. This section of the report defines each landscape unit and describes the landscape character in terms of landform, land cover and land use. Landscape values have been assessed 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.
- Visual values –a subset of landscape values which relate to the visibility of a particular landscape or natural feature seen from public vantage points such as district highways.

Landscape Unit 1 Hill Country Overlooking the Pigroot

Landscape Unit 1 (LU1) occupies the southwest facing rolling hill country which overlooks The Pigroot. The main ridgeline of the Horse Range forms the upper extent of the unit and The Pigroot defines the lower extent. The unit is divided into several grazing blocks which are easily accessible by a network of well-maintained tracks.

The landform is dominated by a series of rounded ridgelines divided by winding concave gullies. The side slopes of the gullies are regularly indented by depressions which contain both permanent and ephemeral runnels. Occasionally the gully heads are affected by slip erosion. The largest of the gullies contains the headwaters of Green Valley Creek which drains into the Shag River, south of the lease. The existing vegetative cover has been strongly influenced by altitude, aspect, and farm management practices such as burning, oversowing and top dressing. Most of the lower and mid side slopes are clad in a fragmented pattern of modified grasslands and scattered shrublands. The grasslands comprise a sparse covering of both fescue and silver tussock with a mixture of introduced pasture grasses and legumes including sweet vernal, Yorkshire fog, browntop and white clover. Patches of *Coprosma* shrubland clad both the darker and steeper faces. These shrublands also contain exotic woody shrubs including wild hawthorn and elderberry. Douglas fir is present on the lower dark faces that overlook Green Valley Creek. The top section of the unit

grades rapidly into narrow-leaved snow tussock which becomes more infrequent on the sunnier, gentle slopes where there is a greater presence of common short tussock. The inter-tussock spaces are mainly occupied by diminutive native species including dwarf heaths and a prostrate snowberry.

Landscape Values

Most of LU1 has moderate inherent landscape values. The original ground cover has been extensively modified and there are no prominent natural features or landforms. Above the access track at approximately 650 m, the ground cover changes abruptly from modified tussock grassland into a dense sward of narrow-leaved snow tussock. The boundaries to these tall tussock grasslands are typically artificial and frequently follow convoluted fire lines. This leaves the indigenous grasslands landscape compromised.

Potential Vulnerability to Change

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

- Dispersal of wilding pine.
- Further infestation of shrublands by exotic woody species such as wild hawthorn.
- Unsympathetic blocks of plantation forestry sited on the rounded landform.
- Unsympathetic tracking, especially zigzagging up prominent spur lines.

Landscape Unit 2 Central dissected hill country

Landscape unit 2 (LU2) encompasses a wedge-shaped block of dissected hill country in the centre of the lease. The boundary of the unit is defined by the Horse Range to the south and by a lateral spur that descends towards Jimmys Creek to the north. The east margin is the lease's boundary with Kinross which follows the floor of a dish-shaped valley.

The physical relief of the unit is characterised by a broken pattern of narrow-crested spurs separated by deep gullies which are typically asymmetrical in profile. The darker slopes are steeper and hummocky in formation than the corresponding sunnier slopes which are gentler in grade and feature small rock outcrops. To the east, the overall landform becomes more rounded in character, possibly due to the presence of a deeper mantle of colluvium.

Aspect and landform largely dictate vegetation characteristics and composition. The more dissected western gullies are covered in a random pattern of modified short tussock grasslands which contain both fescue and silver tussock species. These common tussocks co-dominate with introduced pasture grasses and legumes. Expansive areas of divaricating shrublands clad the darker and steeper faces and a small grove of mature southern kowhai, located in the mid slopes of the main gully, is a notable feature. Small patches of flat hawkweed are widely spread across the drier sunny ridgelines. Towards the east, over the more rounded and rolling hill country, narrow-leaved snow tussock becomes the dominant ground cover supplemented by widely distributed matagouri and golden spaniard. Lineal patterns of scotch thistle

and woolly mullein line disturbed ground beside the access tracks.

Landscape Values

Similar to LU1, much of LU2 possesses moderate inherent landscape values. The original ground cover is extensively modified and the unit lacks prominent natural features or landforms. East of high point 757 m, the darker faces contain moderately high inherent landscape values. This is due to the overall impression of uniformity in the tall tussock grasslands which merge naturally with more modified short grasslands. In many respects this unit is representative of the landscape character of much of the Horse Range. Sunnier slopes which generally contain a high component of both short tussock and introduced pasture species alternate with darker, steeper slopes normally covered in tall tussock grasslands.

Potential Vulnerability to Change

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

- Further loss of tall tussock grasslands due to patch burn-offs.
- Further infestation of flat hawkweed.
- Dispersal of wilding pine.
- Geometric blocks of plantation forestry.
- Unnatural fragmentation of the tall tussock grasslands through further subdivision fencing.

Landscape Unit 3 Middle and lower sections of Jimmys Creek catchment

Landscape Unit 3 (LU3) comprises the mid and lower sections of the catchment area for Jimmys Creek. The well-defined boundaries of the unit include the narrow crest of Otepopo Spur to the northeast and the Horse Range and a major lateral spur to the southwest. The limits to the north cut across the deep V-shaped valley close to high point 908 m. To the south the unit tapers before Jimmys Creek, a major tributary of the North Branch Waianakarua River (NBWR), enters a narrow winding gorge. The Jimmys Creek catchment has been subdivided into approximately eighteen grazing blocks. A network of fencing and track is a relatively conspicuous man-made element.

The principal landform is the long northwest/southeast trending valley that stems from the Cayenne Spur on The Dasher lease. The head of this catchment is deeply dissected and features extensive areas of eroding ground. In profile the valley is commonly asymmetrical with the southwest facing slopes being steep, hummocky and poorly drained. Extensive blocks of rock jut from the side slopes at regular intervals and pockets of gully erosion are principally concentrated on sites that contain deeper colluvium. In contrast the opposite northeast facing slopes are typically planar and constant in grade. For much of its distance, Jimmys Creek is physically constricted within a narrow rock-cut channel bordered by a narrow single terrace. Intermittently, the creek flows across the valley floor with the bed of the channel being contained by stable well-vegetated banks.

Again the vegetation patterns essentially reflect aspect. The lower darker slopes are clad in dense narrow-leaved snow tussock. Divaricating *Coprosma* shrublands commonly surround substantial rock outcrops and occasionally stretch down to cover the narrow terrace bordering the creek. Infrequent damp flushes contain groupings of native toetoe. The tall tussock cover is less dense over the upper section of the shady faces. Corresponding sunnier, planar slopes are clad in tall tussock grasslands which are increasingly more modified in the lower country towards the southeast. Small thickets of matagouri and the occasional clump of turpentine bush are present along the upper spur crests. A feature of the higher zone is the occasional coral broom. Pine seedlings are widely dispersed and well established on most sunny slopes. In landscape terms these comprise a direct threat to the overall integrity of the tall tussock grasslands.

Landscape Values

The inherent landscape values within LU3 are divided into two sections based primarily on landform and aspect. The darker, steeper slopes, especially at the south end of LU3 on the true left of Jimmys Creek, possess significant inherent landscape values due to the presence of substantial rock outcropping surrounded by intact tall tussock grasslands and mixed shrublands. In a wider context, these traits are a part of the recognizable characteristics that extend down Jimmys Creek into the NBWR and beyond.

The corresponding planar slopes convey moderately high inherent landscape values. This is due to the overall sense of visual coherence gained from the continuous grasslands. Similar to LU2, small variations in these grasslands are dictated by local topography with the shady side slopes being covered in narrow-leaved snow tussock and the sunnier slopes in more modified mixed grasslands. The tall tussock component in the grasslands' sward becomes more prevalent above high point 807 m. These planar slopes make a positive contribution to the natural character of the Horse Range, but do not contain any vivid or memorable qualities.

Potential Vulnerability to Change

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

- Further intensification of land use that would adversely affect the existing homogenous characteristics of the upper section of the unit.
- Further wilding pine spread.
- Unsympathetic siting, colour and exterior finish of "built" structures.
- Further infestation of flat hawkweed.
- Patch burn-offs, especially of the narrow-leaved snow tussock.
- Any damage to the riparian margins of Jimmys Creek.

Summary of visual landscape values on Caithness lease

LU3 has the most distinctive visual qualities. This is due to the striking contrast in colour and texture between the "fine-grained" planar slopes and the opposing steeper, hummocky slopes which feature diverse landscape elements. The visual landscape values of LU1 and LU2 are limited. LU1 contains most of the visually accessible

areas on the lease, primarily those that overlook The Pigroot. These demonstrate a fragmented vegetative pattern and have no visual features that are either memorable or significant to the travelling public. Visual landscape values on LU2 are similar. Much of the unit has disjointed vegetative cover and the unit's higher country is obscured from view from public vantage points by intervening spur crests.

Significance of landscape

Inward views of gullies and larger catchments are more important on Caithness lease than outward views. Much of the Caithness lease, particularly the faces above The Pigroot and the dissected mid country, have moderate inherent landscape value due to a lack of prominent landform features and modification of the vegetative cover by pastoral practices. Tall tussock grasslands in the mid area have some moderate to high inherent values as they grade in with more modified short grassland and contribute to natural character and sense of visual uniformity of the Horse Range.

Substantial rock outcrops in the Jimmys Creek area surrounded by tall tussock grasslands and mixed shrubland have significant values. The lower section of Jimmys Creek, in particular, is notable due to the creek being entrenched by a rock-cut channel and surrounded by rocky bluffs and over-steepened side slopes. These characteristics are also evident along the NBWR and beyond.

2.2 Landforms, Geology & Soils

Landforms

The Caithness lease is located within the band of high dissected hills which form the transition zone between the Kakanui Mountains and the Horse Range/Razorback Range system. They are mostly steep and incised, but contain some relicts of the Otago peneplain surface.

Uplifted northeast/southwest trending moderately steep ridges with parallel drainages are the predominant landforms. Two main landform components characterize the lease. The first is the northwest/southeast trending asymmetrical valley that stems from the Cayenne Spur to the north. This valley contains Jimmys Creek, one of the main feeder streams to the NBWR. The second is the block of dissected high hills that separate the main valley from The Pigroot. These high hills are representative of the hill country which flanks the Kakanui Mountains and extends toward the coast as the Horse and Razorback Ranges. Other landform features evident on the lease include rock outcropping, primarily near streams, and large active slips in the headwaters of Green Valley Creek.

Geology

The Horse Range is part of a block that lies between the sub-parallel Waihemo and Waitaki Fault systems. The block has in recent times been uplifted on the northeast of the Waihemo Fault. Many subsidiary faults of the same trend lie within this block. Most of Jimmys Creek, for example, runs along one of these faults. This block is composed of Rakaia Terrane sandstone, mudstone and semischist (Forsyth 2001).

The basement geology on Otepopo Spur is fractured schist with greywacke and argillite on Jimmys Creek and the main ridges. These rocks are exposed in many small bluffs on the lease, particularly along the mid and lower slopes of valleys. Recent alluvial flats are present along Jimmys and Green Valley Creeks (Comrie 1992).

Soils

The yellow-grey earths of the Tengawai set are the predominant soils of low elevation mountain slopes and low rainfall parts of the Dansey ED. These soils are confined principally to the lower, steeper and relatively dry western slopes of the Kakanui Mountains around the Horse Range and Pigroot area (Comrie 1992).

Data from the Land Environments of New Zealand (LENZ) data set, discussed further in the following section, identifies soils in the higher altitude areas of Caithness lease as predominantly well drained, moderately fertile and derived from greywacke and schist in the Q1.1 and Q2.1 environments (Refer Map 4.2.4). Imperfectly drained moderately fertile soils derived from schist characterise the Q3.3 environment.

Soil types on the southwest boundary of Caithness lease include imperfectly drained and moderately fertile soils derived from schist and quartz gravel in the Q4.3 environment. Imperfectly to well drained soils derived from greywacke alluvium and loess, and from schist and greywacke characterise the N3.1 and N3.3 environments respectively. Imperfectly to well drained high fertility soils derived from greywacke gravels characterise the N2.2 environment.

Significance of Landforms, Geology and Soils

No sites of significance with regard to landforms, geology or soils have been identified on Caithness lease.

2.3 Land Environments of New Zealand

The environmental distinctiveness of this area has been assessed through 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.

The data in this report is presented at Level IV which more adequately reflects biodiversity distribution, past clearance and current vulnerability across the landscape than higher levels of LENZ (e.g. level II). Threat classification at level IV results in substantially more effective and efficient identification of threatened remaining indigenous cover.

When the Level IV LENZ information is overlaid against the area of unprotected indigenous cover in threatened land environments, as identified in the national land cover database (LCDB), it is possible to identify biodiversity most likely to be lost. Measures of the percentage of biodiversity legally protected and the percentage of

indigenous vegetation cover remaining are described as follows:

Table One: Land Environments of New Zealand Threat Classification Categories.

Threat Classification	Description
Acutely threatened	<10% indigenous vegetation cover remaining
Chronically threatened	10-20% indigenous vegetation remaining
At risk	20-30% indigenous vegetation cover remaining
Critically underprotected	> 30% indigenous vegetation cover remaining and <10% protected
Underprotected	>30% indigenous vegetation cover remaining and 10-20% protected
No threat	>30% indigenous vegetation cover remaining and >20% protected

The LENZ environment Q, the dominant environment of the mountains and hill country of the southeast South Island (Leathwick at al, 2003), is predominant on Caithness lease (refer Map 4.2.4). At Level IV classification ~66% of the Caithness lease comprises the ‘at risk’ Q2.1c environment. Of the remaining area the ‘not threatened’ Q1.1d comprises ~16% and the ‘critically underprotected’ Q2.1a comprises ~13%. Very small areas of alluvium plain type environments N3.3a (~2%) and N3.1e (~2%) are present along the west boundary of the lease near Green Valley Creek. Negligible amounts of the Q4.3b, Q3.1d and N2.2a environments are also present. Table Two presents a full LENZ analysis of Caithness lease. A full description of each LENZ environment is appended (refer Appendix One).

Table Two: LENZ environments represented on Caithness lease.

Threat classification	LENZ	Area on Caithness lease (ha)	% indigenous cover remaining nationally	% indigenous cover protected nationally	Change in indigenous cover 1997-2002 nationally
Acutely threatened	N2.2a	0.07	0.92	1.23	No change
	N3.3a	51.30	2.55	0.7	Decrease
Chronically threatened	N3.1d	1.16	13.5	0.53	Decrease
	N3.1e	40.09	12.65	1.94	Decrease
	Q4.3b	2.81	17.14	3.18	Decrease
At risk	Q2.1c	1450.74	24.56	8.5	Decrease
Critically underprotected	Q2.1a	284.17	38	9.27	Decrease
Underprotected	Q3.3c	1.20	90.03	17.21	Decrease
No threat	Q1.1d	352.89	84.66	34.76	No change

Significance of Land Environments of New Zealand

Areas on Caithness lease represent the following land environments. These environments are significant because on a national level the indigenous vegetation has largely been removed, and/or little of the environment is represented in lands protected primarily for conservation purposes.

- 2% of the lease contains 2 Level IV LENZ units (N2.2a and N3.3a) which have less than 10% of the land area still in indigenous vegetation cover nationally (whether protected or unprotected). These are 'Acutely Threatened' environments.
- 2% of the lease contains 3 Level IV LENZ units (N3.1d, N3.1e and Q4.3b) which have 10-20% of their land still in indigenous cover nationally (whether protected or unprotected). These are 'Chronically Threatened' environments.
- 66% of the lease contains the Level IV LENZ unit Q2.1c which has 20-30% of its land area still in indigenous vegetation cover nationally (whether protected or unprotected). This is an 'At Risk' environment.
- 13% of the lease contains the Level IV LENZ unit Q2.1a which has 30% or more of its land area still in indigenous cover nationally and <10% is protected. This is a 'Critically Underprotected' environment.
- Less than 1% of the lease contains the Level IV LENZ unit Q3.3c which has >30% of its land area still in indigenous cover nationally and 10-20% is protected. This is an 'Underprotected' environment.

2.4 Climate

The climate in this area is sub humid. Winters are cold, with heavy frosts on the flats and occasional snowfall. Summers are mild. Annual rainfall is between approximately 600 mm and 800 mm (Comrie 1992).

Climatic information in the LENZ dataset describes the higher altitude Q environments as cool to cold, with generally moderate solar radiation, moderate vapour pressure deficits, low to moderate water balance ratios and slight to moderate annual water deficits. Climatic conditions typical of the N environments along the Waihemo fault are cool to mild temperatures, low to moderate solar radiation, moderate vapour pressure deficits and moderate annual water deficits.

2.5 Vegetation

Botanical information was primarily gathered during the on-site inspection. Additional information was obtained from previous reports including the PNAP survey report (Comrie 1992) and information held in the Department of Conservation BIOWEB database.

Pre-human vegetation patterns

Comrie (1992) and Walker et al (2003) describe the likely prehuman vegetation patterns of the area. They suggest early vegetation is likely to have comprised mixed tussock grassland and shrubland with narrow-leaved snow tussock (*Chionochloa*

rigida) intermixed with matagouri, *Dracophyllum uniflorum*, *Carmichaelia crassicaule* and *C. petriei* on higher ridge crests. Rocky knobs are likely to have hosted a variety of herbs including *Coriaria sarmentosa*, *Pimelea traversii* and *P. pseudolyallii*.

The prehuman vegetation of valley floors and lower hill slopes in the area of Caithness lease is likely to have comprised forest of kowhai (*Sophora microphylla*) and cabbage tree (*Cordyline australis*). Lowland ribbonwood (*Plagianthus regius*) would have been common and broadleaf (*Griselinia littoralis*) would have occupied rockier sites. The understory would have contained putaputaweta (*Carpodetus serratus*), mapou (*Myrsine australis*), *Coprosma crassifolia* and *C. lineariifolia*. Hall's totara (*Podocarpus hallii*) and mountain toatoa (*Phyllocladus alpinus*) would have become predominant with increasing altitude. Stream terraces would likely have hosted matagouri (*Discaria toumatou*), *Coprosma propinqua*, *C. rugosa*, *Olearia lineata* and *O. bullata* shrubland.

Overview of current vegetation patterns

Vegetation patterns present on the lease and those described for this area by Comrie (1992) indicate much of the supposed original vegetation is absent. Near natural examples of the prehuman vegetation exist at higher elevations (above c.700 m). Scattered vegetation remnants centred on gullies, rocky sites and fire refugia are present below that altitude and additional pockets of remnant forest are found in some valleys, particularly towards the southern end of Jimmys Creek. In the absence of forest, mixed tussock grassland and shrubland has extended down slope and this zone has become intermixed with a large number of exotic herbs and grasses. Lower hill slopes and stream terraces are predominantly cloaked in exotic grasses and exotic woody weeds.

The lease has a diverse native flora with 204 species recorded in this tenure review survey (species list attached as Appendix 2). This represents 68% of the number of native species recorded during the PNA survey for the Dansey ED. Sixty seven exotic species were recorded during the tenure review survey, 24% of the total number of species. This represents an increase in exotic species from the PNAP survey with 27 exotic species not previously recorded in the area, present on the lease

Vegetation communities

Upper Basin

The upper basin catchment of Jimmys Creek has good cover of narrow-leaved snow-tussock, the dominant vegetation. Blue tussock (*Poa colensoi*), speargrass (*Aciphylla aurea*), matagouri, *Pimelea pseudolyallii* and *P. traversii* are important components. The threatened *Celmisia hookeri* and *Pimelea pseudolyallii* are present at several sites in reasonable numbers. *Raoulia subsericea* and native herbs comprise approximately half the non tussock ground cover and the hawkweed *Hieracium pilosella* the other half. A scattered population of the threatened coral broom is present along the ridge. Plant diversity increases and the condition of the tussock grassland improves towards Jimmys Creek. Scattered shrubland exists along Jimmys Creek with occasional broadleaf and cabbage trees. Several small, seepage-based, wetlands are present.

Central High Points

This area along the broad tops of the main ridge from high point 807 m to beyond high point 794 m includes rocky tussock grassland with limited areas of short grassland on flat rocky sites. Herbaceous diversity is high in this area which also contains healthy populations of coral broom and scattered shrubs of *Carmichaelia petriei*, matagouri, *C. rugosa*, *P. pseudolyalli* and *P. traversii*. Rock outcrops harbour several herb and fern species. The threatened grasses *Elymus falcis* and *Deschampsia pusilla* are present in low numbers.

A series of small steep bluffs adjacent to high point 794 m host healthy populations of cliff-dwelling shrubs and herbs including *Helichrysum intermedium*, *Coprosma rugosa*, *Senecio glaucophyllus* subsp. *discoideus*, mountain oat grass (*Deyeuxia avenoides*) and long-haired plume grass (*Dichelachne crinita*). The threatened coral broom, *C. hookeri* and highly palatable carrot-like *Gingidea grisea* are present in good numbers.

Jimmys Creek

This area includes the flats and valley sides of the main Jimmys Creek and its tributaries. Shrublands of *C. propinqua* and *C. petriei* dominate with *O. bullata* common and patches of *C. rugosa*. *Clematis marata* and *Aristotelia fruitcosa* are also present. This shrubland becomes more scattered upstream. Two individuals of the tree daisy *Olearia lineata* are present in the lower reaches. Grassy river terraces are dominated by exotic species, particularly brown top (*Agrostis capillaries*) and sweet vernal (*Anthoxanthum odoratum*), with occasional silver tussock (*Poa cita*), hard tussock (*Festuca novae-zelandia*) and matagouri. Small remnant groves of kowhai persist in two of the tributaries.

Bluffs in the area support good populations of tussock, speargrass (*Aciphylla aurea*), turpentine shrub (*Dracophyllum uniflorum* var. *frondosum*), present at two sites, *G. grisea* and *C. hookeri*. A large, unstable shingle scree on the true left of Jimmys Creek supports a *C. propinqua* dominated shrubland with frequent *C. rugosa* and large bare rocky areas, some of which are mossy. This is the only site where the lawyer *Rubus schmidelioides* var. *subpauperatus*, *Corokia cotoneaster*, *Scandia geniculata*, *Senecio wairauensis*, *S. glomeratus*, and *Coprosma crassifolia* are present on the lease, indicative of the value of the site as a fire refuge.

The lowest tributary, which also forms the southeast border of the lease, contains scattered tussock which has been heavily grazed. Exotic grass dominates and patches of sprayed gorse are present. Willow (*Salix fragilis*) and pine species are uncommon and are restricted to the lower reaches of Jimmys Creek.

Green Valley Creek – Slips Shrubland

The flats contain patches of matagouri, *C. propinqua*, *Muehlenbeckia complexa* and *C. rugosa* but are dominated by exotic grassland and briar patches. Unstable open areas of the stream bed retain some patches of native vegetation, primarily *Raoulia* spp., *Muehlenbeckia axillaris* and some *Epilobium microphyllum*. Willow species are present. Lower hill slopes contain scattered hard tussock and occasional silver

tussock but are dominated by exotic grass. These slopes have a high weed component.

A small deeply incised tributary stream contained good populations of *Fuchsia perscandens* and wineberry (*Aristotelia serrata*) mixed with *C. propinqua*, matagouri, rowan, gooseberry and occasional *C. rugosa* and *O. bullata*.

Problem Plants

Problem plants are primarily restricted to the Green Valley Creek flats and adjacent hillslopes where briar (*Rosa rubiginosa*) and gooseberry (*Ribes uva-crispa*) can be abundant. The wooded gully along the headwater tributary of Green Valley Creek contains abundant elder and briar mixed with native woody species. One plant of tutsan (*Hypericum androsaemum*), which can form monospecific groves excluding most other plants, is present in a tributary of Green Valley Creek.

Wilding pines (*Pinus nigra*), including some quite large trees, are established in the lower reaches of Jimmys Creek. Large numbers of wilding pines are present in the northwest area of the lease and elsewhere are scattered throughout the lease. Poplar (*Populus deltoides*) and willow (*Salix fragilis*) have been planted for erosion control and stock shade. If not controlled the occurrence of these could be expected to expand and diminish the conservation values associated with riparian shrubland accordingly. Competition from woody weeds is also displacing native shrubland from valley floors in the Jimmys Creek area. Again, this will restrict the potential range of this community type if allowed to spread. Wilding willows are present in low numbers in the lower reaches of Jimmys Creek. Gorse (*Ulex europaeus*) is present in the boundary tributary of Jimmys Creek and has been sprayed.

Other problem plants present include local patches of broom (*Cytisus scoparius*) which can dominate stream terraces and open hillsides, occasional blackberry (*Rubus fruticosus*), nodding thistle and Californian thistle which are widespread in some areas. Hawkweed, mainly *Hieracium pilosella*, is common in tussock grassland.

Significance of vegetation

Fourteen nationally threatened or regionally uncommon species are present on Caithness lease (Refer Table 3).

Table Three: Nationally threatened and regionally uncommon species on Caithness lease.

Threat Classification (Hitchmough, 2002)	Species	Comment
gradual decline	<i>Carmichaelia crassicaule</i>	Populations are present near most high points on the ridges
range restricted	<i>Dracophyllum uniflorum</i> var. <i>frondosum</i>	A population of this sprawling shrub is present on a bluff near the base of Jimmys Creek and on the large shingle slide in Jimmys Creek

range restricted	<i>Elymus falcis</i>	This grass is present in depleted short grassland on top of the main ridge.
	<i>Gingidia grisea</i>	New name for what appears in de Lange et al (2004) as <i>Gingidia</i> aff. <i>montana</i> (b) (CHR 103349; North Otago).
sparse	<i>Pimelea pseudolyallii</i>	This sprawling shrub daphne is present in good numbers in the far corner of the lease and around high point 838 m.
	<i>Celmisia hookeri</i>	Populations of this daisy are present at the far corner of the lease, on the bluffs near high point 794 m and on nearly all bluffs in Jimmys Creek and tributaries.
	<i>Olearia lineata</i>	Two individuals of this species are present in lower Jimmys Creek.
data deficient	<i>Deschampsia pusilla</i>	This small grass was recorded in tussock grassland on the ridge top in the area of trig C and high point 807 m

Locally notable species

Locally notable species or species considered threatened within the DOC Otago Conservancy and species uncommon in this area but reasonably common in the rest of Otago present on Caithness lease include:

- A population of the climbing *Fuchsia perscandens* in a tributary of Green Valley Creek.
- A large population of the wineberry *Aristotelia serrata* in a tributary of Green Valley Creek.
- One seedling of Hall's totara *Podocarpus hallii* in Jimmys Creek. No adult trees appear to be present.
- The shrubby daphne *Pimelea traversii* on more open and rockier knobs of the main ridge at high points 838 m, 938 m and at the northwest corner of the lease. This is probably the easternmost known population of this species in Otago.
- Two small groups of kowhai *Sophora microphylla*, one with 2 trees, one with c. 20 trees are present in tributaries of Jimmys Creek. Kowhai forest is rare in the ED.
- The endemic fireweed *Senecio glaucophyllus* subsp. *Discoideusis* present on bluffs near high point 794 m in several small groups. This is an unusually low altitude population of a predominantly alpine scree species.

2.6 FAUNA

2.6.1 Invertebrate fauna

Assessment of invertebrate values

Invertebrate values in this survey have been assessed primarily on the basis of habitats present, as the inspection timing, sampling conditions and the short sampling period will have limited the invertebrate diversity evident. Invertebrates generally have a short, specific activity season. For most species this occurs between late spring and mid summer, usually the best time for sampling, although it can be at completely different times of the year including winter. Weather conditions can be a key factor influencing both invertebrate activity levels and also site accessibility. In surveys such as this where the sampling period is short, sampling is, by necessity, fragmentary. Usually only the more accessible sites are surveyed in any detail and only the more accessible species are likely to be detected. A lack of up-to-date taxonomy, identification tools and available specialist identification can also influence the invertebrates recorded. Therefore, surveys of this nature seldom reveal as much as 5% of the total invertebrate diversity of a lease.

Survey Method

Weather conditions during the survey period were generally good for invertebrate collection. Survey time was divided between walking through different habitats to assess invertebrate potential and using search techniques such as beating, sweep-netting and rolling rocks and logs to find specimens. A light trap operated for three hours on the night of 21 February, sited in riparian grey scrub habitat near a small rocky bluff on flats toward the lower part of Jimmys Creek at ~ I42 171 485. Light cloud and a full moon reduced the efficacy of the trap by reducing both the attractiveness of the UV light and the distance over which flying insects were attracted.

Much of the lease was viewed from vantage points, as rough steep terrain and limits on access meant that many parts of the lease were not able to be covered in detail. Major areas not inspected for invertebrate values included the northeast boundary along Otepopo Spur and southeast faces below high point 757 m and above the boundary.

Sites visited and inspected on foot included:

- Tussock grasslands at a high point of about 930 m at the northwest corner of the lease (west side of Jimmys Creek) about 1 km north of trig point C.
- The area around trig point C, with tussock/pasture interspersed with more open rocky ground and small scree patches.
- Areas on the same ridge, area around the low point just south of high point 807 m.
- Steep, rocky, bluffy faces above Green Valley Creek, west of high point 794 m.
- Grey scrub along the track in tributary of Jimmys Creek (c. I42 168 478).
- Several sites along Jimmys Creek, from the lower (east) boundary to over half way up that part of the creek running through the lease.

- Green Valley Creek, especially the major tributary on the true right, south of high point 838 m.

Invertebrate habitat

Tussock-dominated grasslands

Areas dominated by native tussock are widespread on higher parts of the lease. These grade into the pasture-dominated grasslands and rocklands habitat described below, with few distinct boundaries and often contain small areas of rocky habitat, also described below. Some native inter tussock species are present, but overall the intertussock species are predominantly adventives and/or pasture species.

Rocky Habitat: bluffs and small screes with reasonable plant/habitat diversity

Rocky habitats, mainly bluffs and limited areas of screes or rocky ground, are widespread on the lease. While the bluff habitats in particular harbour plant species which are severely browsed by stock in more accessible locations, overall many of the bluff communities seem relatively sparse in plant and habitat diversity. Much of the rocky habitat is also disconnected from other areas of quality habitat. A few sites however provide very good invertebrate habitat and the area of scree centred on approximately I42 168 492 provides outstanding invertebrate habitat.

Native woody vegetation, predominantly riparian grey scrub

This habitat is most prevalent in the mid and lower sections of Jimmys Creek and in the unnamed tributary on the true right which passes through the centre of the lease. This habitat is also present in a headwater tributary of upper Green Valley Creek. The better examples of this woody vegetation habitat type have good species diversity and include large populations of the small-leaved *Olearia bullata*. These habitats will harbour a diverse invertebrate community through the year including, amongst others, a range of *Coprosma* and *Olearia* species specialists.

Pasture-dominated grasslands and rocklands with limited diversity

Areas dominated primarily by pasture or more modified rocklands generally have lesser invertebrate values. The major part of the lease comprises this habitat type.

Invertebrate species

Invertebrate values are largely centred on areas of rock outcrop and bluff and the vegetation associated with riparian zones. Lesser values are associated with the modified but moderately extensive tussock grasslands of the higher altitude sites.

Most invertebrate species recorded from the lease (refer Appendix Three) are quite widespread in distribution, although a few are more or less limited to Otago or eastern Otago. These include the cicada *Maoricicada otagoensis* which is endemic to Otago and Southland, and boulder copper butterfly (*Antipodalycaena* n.sp.), currently an undescribed species, which is localised but can be common around its larval food plant *Muehlenbeckia axillaries*.

Tussock-dominated areas contain good native species diversity, which includes many species of flies, large numbers of common species of grasshopper and cicadas, and grassland moths and butterflies. Diversity generally increases when the tussock lands are continuous with areas of bedrock, small scree and/or hardrock bluffs.

The light trap species catch gives some indication of the moth community associated with grey shrub and rocky bluff habitat. A good variety of species associated with rock faces, where the larvae feed on mosses and/or lichens are present despite the seasonal timing of the survey which does not favour likely species of interest such as key *Olearia* specialists.

Significance of invertebrates

Native woody vegetation, predominantly riparian grey scrub, and rocky habitat with reasonable plant and habitat diversity have moderate to very high invertebrate values. Such sites are evident in the bluff and scree systems, small outcrops and riparian vegetation of the Jimmys Creek area. Other similar sites also have some invertebrate values but these are lessened by a higher degree of modification and/or a lack of connection between areas of habitat. These sites include a grey scrub patch on bluffs in Jimmys Creek, a woody gully on the true right of Green Valley Creek and an exposed southwest facing bluff system. Tussock grassland sites have moderate values and pasture dominated grasslands and rocklands with limited plant diversity have fewer invertebrate values.

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.”

Known lizard population distributions and the results of recent lizard surveys on nearby properties (Appendix Four), indicate the likely presence of several lizard species on Caithness lease. These are predicted to include the green skink (*Oligosoma chloronoton*), common skink (*O. nigriplantare polychroma*), McCanns skink (*O. maccanni*), the jewelled gecko (*Naultinus gemmeus*) and the gecko *Hoplodactylus* aff. *maculatus* (Hitchmough 1997, ARDS database, Whitaker et al 2002).

Species and habitat description

Varied lizard habitat is present on the lease including grassland, shrubland, riparian

margins, outcrops and small bluffs. On a wider scale most of the rock outcrops and bluffs on the lease have a south-westerly aspect which is not favourable for lizards. Rock outcrops tend not to be fractured, resulting in little loose and creviced rock favourable for lizard retreats. There is little scree and the one major large unstable shingle scree observed has a southerly aspect. The northern half of the lease has little rock and provides less suitable habitat for lizards.

Warm fine weather encouraged lizard activity during the survey period. McCanns skinks, frequently encountered at rocky sites, are present as are *Hoplodactylus* sp. geckos. These, most likely *Hoplodactylus* aff. *maculatus* 'Otago/ Southland large', are present at several rocky sites. (Hitchmough 1997, Jewell in press).

Jewelled geckos are not evident on the lease but are characteristically difficult to find and may be present. A population of jewelled gecko is known approximately five kilometres downstream from Caithness on the NBWR and Caithness lease is well within their migratory limits. Good habitat for jewelled gecko is available in mixed shrublands in a tributary of Jimmy's Creek. Additional habitat is present in extensive shrubland which extends up gullies, in a patch of shrubland in Jimmy's Creek and in scattered shrubland downstream to the eastern boundary of Caithness and beyond to the confluence with the NBWR.

Significance of Herpetofauna

Two lizard species are present on Caithness lease. *Hoplodactylus* aff. *maculatus* "Otago/Southland large" has a threat status of 'gradual decline' (Hitchmough 2002). This gecko is widespread throughout rocky alpine areas of inland Southland and also throughout Otago, is locally abundant and occupies a wide range of habitats including habitat at high elevations (Whitaker *et al*, 2002). McCanns skinks (*Oligosoma maccani*), also present, are not considered to be threatened with extinction. These skinks are widespread and common in Otago (Hitchmough 2002, Whitaker *et al*, 2002).

Common skinks (*O. nigriplantare polychroma*) and green skinks do not appear to be present. Suitable green skink habitat, however, is present on Caithness lease and populations are known in nearby areas. Good habitat for jewelled gecko *Naultinus gemmeus*, classified as in 'gradual decline' (Hitchmough, 2002), is also present and is within the limits of the gecko's migratory ability.

2.6.3 Avifauna

Table Four: Bird species present on Caithness lease- exotic species are denoted *

Bird	Scientific Name	Comment
Australasian Harrier	<i>Circus approximans</i>	
Eastern Falcon	<i>Falco novaeseelandiae</i> 'eastern'	Present near steep bluffs adjacent to high point 794 m
Magpie*	<i>Gymnorhina hypoleuca</i>	Open tops
Skylark*	<i>Alauda arvensis</i>	Open tops
Grey Warbler	<i>Gerygone igata</i>	Jimmys Creek shrublands
Paradise Shelduck	<i>Tadorna variegata</i>	Jimmys Creek shrublands
Brown Creeper	<i>Mohoua novaeseelandiae</i>	Jimmys Creek shrublands
Black Shag	<i>Phalacrocarax carbo</i>	Jimmys Creek shrublands

Significance of avifauna

Eastern falcon (*Falco novaeseelandiae* 'eastern'), classified as in 'gradual decline' (Hitchmough, 2002), are present near bluffs on the mid southwest boundary of the lease. Black Shag (*Phalacrocarax carbo*) are classed as 'sparse'.

2.6.4 Aquatic Fauna

Caithness lease straddles the Horse Range. The terrain is steep and many small streams flow off the hills. Two main lower gradient waterways, Green Valley Creek and Jimmys Creek, flow into the Waianakarua River and the Shag River catchments respectively. The Shag River Catchment is classified as a Type I Catchment where the majority of the catchment is considered to be nationally significant (Chadderton 2005).

Method

Streams within the lease expected to have aquatic life were identified from 1:50,000 topographical maps. Stream access was restricted to existing tracks and roads due to the steep terrain; however, reasonable access over the lease was possible. Where streams were large enough many sites were sampled.

Sites surveyed contained both riffle/run and pool habitat. Sites were surveyed using a Kainga 300 backpack electric fishing machine and stop net. General observations of terrain, riparian vegetation, stream substrate and fish habitat type were made. These were recorded for each site using the NZ Freshwater Fisheries Database form format. Stream width, depth, water temperature, conductivity and distance fished were also

recorded. The location of survey sites was recorded using a Garmin Global Positioning System (GPS) unit.

Fish and aquatic invertebrates were collected at each site. Captured fish were measured, either fork length or total length as appropriate, to the nearest 1mm then returned to the sampling location. Five fish were kept for genetic analysis. Aquatic insects found on the stop-net during fishing were identified after each sub-sample sweep and abundance visually estimated as “low, moderate or high”. The lower end of Green Valley Creek was visually inspected at several locations to determine if galaxiids, in particular juveniles, were present and to locate any downstream barriers. The absence of juveniles in late summer can indicate the presence of trout.

The identification of galaxiids was based on morphological features and knowledge of fish species caught elsewhere in the catchment. *Galaxias* species can be difficult to identify and genetic analysis is best used to confirm identification. Ongoing genetic work on the *G. depressiceps* populations from the Shag catchment indicates there may be a complex of species or genetic groups present; a new species may be identified (*G. Wallis* pers. comm.).

Results

Stream flows during sampling were higher than normal for summer due to a wet season and recent rainfall. Flowing water was observed in most creeks located in steeper gullies, but this is unlikely to reflect the situation in a normal or dry summer. Three major gullies on the lease contain permanent flowing water. These are Jimmys Creek, a tributary of Jimmys Creek, and Green Valley Creek.

In the Waianakarua catchment Jimmys Creek contains good permanent flow and diverse instream habitat types. With the exception of the Jimmys Creek tributary which was also sampled, all other waterways are steep, possibly ephemeral, and contain little or no fish habitat.

In the Shag catchment, the small Green Valley Creek contains large filamentous algal growths which indicate nutrient enrichment. Areas of damage where stock comes to drink or cross the waterway are also evident. All other waterways in the Shag catchment are steep, possibly ephemeral, and contain little or no fish habitat. Elevated temperature and conductivity in Green Valley Stream reflect a lack of shading, smaller stream size and greater exposure to stock. In contrast, Jimmys Creek has greater flow, more shading and is less impacted upon by stock.

Aquatic species

Three species of fish are present. These are the longfinned eel (*Anguilla dieffenbachii*), the Canterbury galaxiid (*Galaxias vulgaris*) and the flat-head *Galaxias depressiceps* (Table 5). Juvenile galaxiids (~25 mm) are present at all sites fished.

Galaxias depressiceps are abundant in Green Valley Creek. A population of 4-5000 is estimated as being present, based on the survey results. A culvert under State Highway 85, The Pigroot, defines the edge of Caithness lease and creates a barrier to the upstream passage of trout. Galaxiids are present in the pool immediately downstream of the culvert with approximately 30 fish noted which suggests further downstream trout barriers exist.

Aquatic insects are present at all sample locations (Appendix Five). These are most abundant and diverse in Jimmys Creek. Reduced invertebrate densities and diversity in the Jimmys Creek tributary and in Green Valley Creek relate to the smaller size of these streams and an associated reduction in habitat heterogeneity.

Table Five: Fish Species caught, Threat Status, Size of Fish and Capture Location.

Fish Species	Threat Status (Hitchmough 2002)	Length range (mm)	Capture Location (no. of locations)
<i>Galaxias vulgaris</i>	not threatened	40-97	Jimmys Creek (4) Tributary of Jimmys Creek (1)
<i>Galaxias depressiceps</i>	gradual decline	30-75	Green Valley Creek. (3)
<i>Anguilla dieffenbachii</i>	gradual decline	250	Jimmys Creek (1)

Significance of aquatic fauna

Jimmys Creek provides a variety of instream habitat types for all galaxiid life stages. The water is of good quality, and supports a diverse and healthy invertebrate fauna. A large and healthy population of *G. vulgaris* in Jimmys Creek, at the southern extremities of its range, reflects the excellent habitat condition. The absence of trout in Jimmys Creek indicates a barrier to trout migration exists downstream, although the location is not known. The Jimmys Creek tributary provides limited habitat for galaxiids due to the small nature of the waterway and low flows during drought conditions. Some pugging and habitat degradation is evident at a few stock crossing points. The longfinned eel *Anguilla dieffenbachii* (gradual decline), present in Jimmys Creek, is unusual as the creek does not provide large amounts of the habitat usually associated with longfinned eels.

Green Valley Creek is a small modified waterway, which, in places, suffers from low flows and stock damage to the instream environment and likely nutrient enrichment. This stream contains the flathead *Galaxias depressiceps* (gradual decline) in all size/age classes which indicates a self-sustaining reproducing population is present. A culvert at State Highway 85 provides a barrier to upstream trout migration and further barriers may exist downstream as galaxiids are also present below the culvert in the neighbouring lease. The small size of the stream and associated elevated water temperatures are likely to prevent trout establishment even if barrier(s) are no longer present.

Flathead galaxiids are classified as a chronically threatened species in gradual decline (Hitchmough, 2002). Flathead galaxiids occur in Central and Eastern Otago with populations limited to the Shag, Taieri and Waikouaiti Rivers and Akatore Creek just south of the Taieri River. Flathead galaxiids are subject to the *New Zealand Non-Migratory Galaxiid Fishes Recovery Plan* (DOC 2004) which undertakes to protect a minimum of thirty habitats with key non-migratory galaxiid populations for each species. A total of twenty-four flathead populations are currently known and only one is protected. Each additional population identified is a priority for protection.

Genetic testing of the Shag River populations has shown high genetic variability between populations. Different streams in the catchment retain different sub-sets of the total genetic variation present. Retention of populations throughout the catchment is required to retain the full suite of variation present.

2.6.5 Problem Animals

Small areas of pig rooting are evident near grey scrub areas in the lower Jimmys Creek area. This does not appear to be recent. 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 most probably present throughout the lease. These undoubtedly reduce populations of palatable native plants, native birds, reptiles and invertebrates.

2.7 Historic

Most of the Caithness lease was originally part of the back country of the larger Otepopo Run 217. A small section, west of the Horse Range, was part of the Shag Valley Estate. The property was reduced and re-established as a smaller Run 217 some time before 1870. Run 217 was the property of Edward McGlashan, a mid-nineteenth century entrepreneur and would have been managed by shepherds. A small block of freehold land on the southwest boundary of Caithness lease was the site of a school house.

Significance of historic resources

No archaeological sites have been recorded on this lease and there are no known Maori sites in the New Zealand Archaeological Association site record files. No sites of historic importance are currently known on Caithness lease.

2.8 Public Recreation

Physical Characteristics

Caithness lease is characterised by a series of spurs and creek valleys. The terrain is generally steep and the margins of waterways are steep and gorge-like in places. The lease lies on the Horse Range and provides access to that range and to the Waianakarua River system.

Legal Access

Access to the Caithness lease is from SH 85 The Pigroot. No legal access routes are present within the lease.

Activities

The recreation settings, activities and experience characteristics of the land area of the Otago Conservancy are classified and mapped, regardless of land tenure, in the Otago Conservancy Recreation Opportunity Spectrum (Harper 1992). Caithness lease is identified as lying within the Back Country Drive In/4WD Drive-In recreation opportunity settings. These categories are characterised by good road access routes which allow visitors into pockets or corridors which afford a relative sense of remoteness (Harper, 1992). Recreation experiences in these settings are described as being 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. Activities most often associated with this opportunity are tramping, hunting, fishing, tent camping, climbing, mountain biking, outdoor education and nature appreciation. Day and overnight trips are common.

A network of formed farm tracks within the lease provides potential walking, horse, mountain bike, 4WD and trail bike routes. Areas of shrubland provide opportunities for botanising and nature appreciation.

Significance of Recreation

Recreation opportunities are limited on the lease. Access to the Horse Range and the Kakanui Mountains or to the Waianakarua River system via the network of farm tracks is likely to be the most significant recreational opportunity present of the lease.

PART 3 OTHER RELEVANT MATTERS AND PLANS

3.1 CONSULTATION

An early warning meeting was held in Alexandra on 23 September 2004. Interest group representatives made the following comments with regard to the Caithness lease.

Public Access New Zealand (PANZ)

- Strategic access possible through the Caithness lease is a component of a traverse of the Kakanui Range.

Dunedin Forest and Bird

- Access off the Pigroot is important, as is the potential for outcome of this tenure review to contribute to the scenic corridor.

Upper Clutha Forest and Bird

- The road faces are predominantly matagouri.

Hunting

- Pigs are present; access is an issue that should be sorted out during the tenure review.

Federated Mountain Clubs (FMC)

- Access through the lease to the North Branch Waianakarua system is required.
- All land classified LUC Class VIII should become conservation or stewardship land because pastoral use of such land is not ecologically sustainable
- Most land above 1,000 – 1,100 m should also become conservation land either because of SIV's or because ecologically sustainable pastoral land use is not possible as it is uneconomic to maintain the balance of nutrient losses caused by grazing and burning.
- Weed invasion by broom, gorse etc is unlikely to be a problem on land above about 1,000 m
- It is understood that LINZ has agreed that all waterways which obviously qualify for marginal strips will have marginal strips formally recognized as part of tenure review. Other waterways which may qualify for marginal strips should also be assessed because if these qualify for marginal strips this decision has a significant impact on what public access provisions will be

required during tenure review.

- FMC reports on neighbouring properties have advocated public access to the Horse Range and the Waianakarua River system. Complementary access will be required on Caithness. A farm track leading from SH 85 to the Horse Range and then to the NBWR could provide important recreational access. This access is likely to be the most significant recreational issue in this tenure review.

Written submissions were also received. A summary of the key points contained in those submissions is outlined below. A copy of the full reports is attached in section 4.4 (refer Appendix Six and Appendix Seven).

Central Otago Deerstalkers Club

The Central Otago Deerstalkers Club request that:

- Good public four wheel drive access be a result of tenure reviews;
- Permission to carry guns be met by DOC permit only; and
- Access for hunting dogs be secured as a result of tenure reviews.

New Zealand Deerstalkers Association (NZDA) - Southern Lakes Branch

Southern Lakes Branch NZDA requests:

- More recognition be given to hunting as a recreational activity
- Provision be made, where appropriate, for access with firearms and/or dogs

3.2 REGIONAL POLICY STATEMENTS & PLANS

Otago Regional Policy Statement

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

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

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

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

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

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

3.3 DISTRICT PLANS

The Caithness lease is located within the Rural Scenic (majority of the lease) and Rural General (southern corner of lease) zones of the Waitaki District Plan.

As at 23 February 2005, the partially operative Waitaki District Plan requires resource consent for the clearance of indigenous bush greater than 3m in height, for earthworks (other than for maintenance of structures and subject to certain criteria), and for forestry in the Rural Scenic zone. No indigenous vegetation clearance, exotic tree planting, earthworks or buildings are allowed within 20m of a water body or in any wetland, or on any land above 900m in altitude (with certain exemptions). There are effectively no provisions that protect landscape values. There are no registered archaeological sites, or areas of significant indigenous vegetation and habitat of significant indigenous fauna on the lease, 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 Caithness lease lies to the west of the adjoining Kakanui Special Place and the Shag Point –Waianakarua Special Place.

Shag Point - Waianakarua Special Place encompasses almost all the Waianakarua ED which adjoins the Dansey ED. Priorities for the Waianakarua Special Place include extending, rationalising and securing protected area boundaries (both coastal and inland) and improving ecosystem management and species habitats (CMS:177). Of minor relevance to Caithness lease is an identified management issue which relates to river quality degradation resulting from agricultural run-off. This may have some relevance if pastoral activity on Caithness lease was intensified.

The Kakanui Special Place largely comprises the Kakanui Mountains. The key objective for the Kakanui Special Place is to maintain the natural resources contained within the existing protected areas on the Kakanui Mountains while taking opportunities that may arise through pastoral lease tenure review to negotiate protection of and access to areas of high natural and recreational value (CMS:259)

Management issues identified for the Kakanui Special Place with some relevance to the Caithness lease include: the limited access available to the Kakanui Range; wilding pine control; landscape protection on the Kakanui mountains i.e. advocacy on burning, tracking issues and plantation forestry; and siting of installations in visually sensitive locations especially skylines.

The CMS priority for the Kakanui Special Place states:

In this special place, tenure review negotiations and wilding tree control will be the priority method for implementing the objective during the course of this CMS

3.5 NEW ZEALAND BIODIVERSITY STRATEGY

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

- *Maintain and restore a full range of remaining natural habitats and ecosystems to a healthy functioning state, enhance critically scarce habitats, and sustain the more modified ecosystems in production and urban environments, and do what is necessary to:-*
Maintain and restore viable populations of all indigenous species across their natural range and maintain their genetic diversity.

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

PART 4 MAPS, REFERENCES, APPENDICES ETC.

4.1 References

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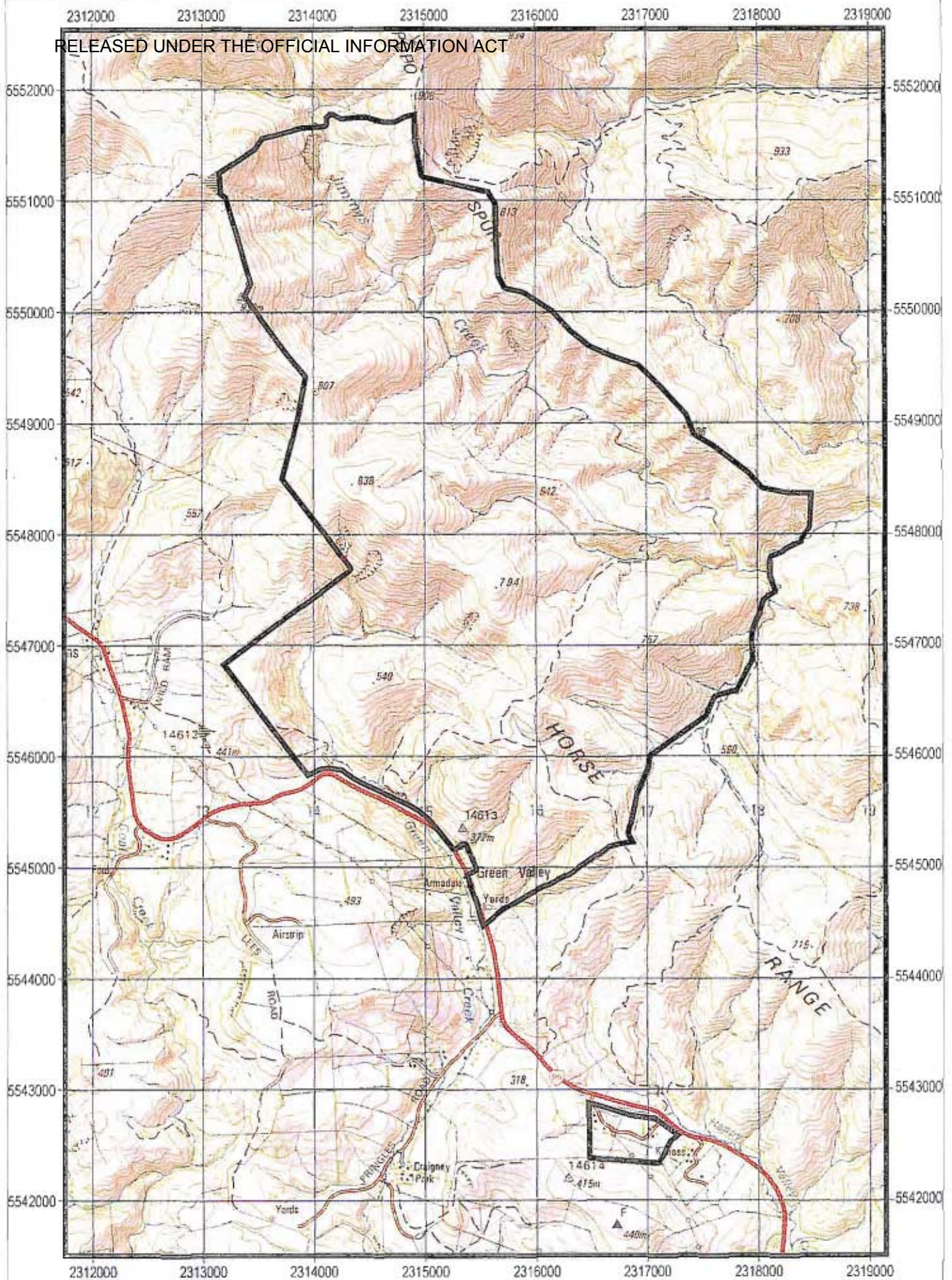
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Whitaker, A., Tocher, M.D., Blair, T. 2002 Conservation of Lizards in Otago Conservancy 2002 - 2007. Department of Conservation, Wellington, New Zealand.

4.2 Illustrative Maps

- 4.2.1 Topographical/Cadastral - Caithness Pastoral Lease
- 4.2.2 Landscape units and significant landscape values - Caithness Pastoral Lease
- 4.2.3 Significant Ecological Values - Caithness Pastoral Lease
- 4.2.4 LENZ - Caithness Pastoral Lease



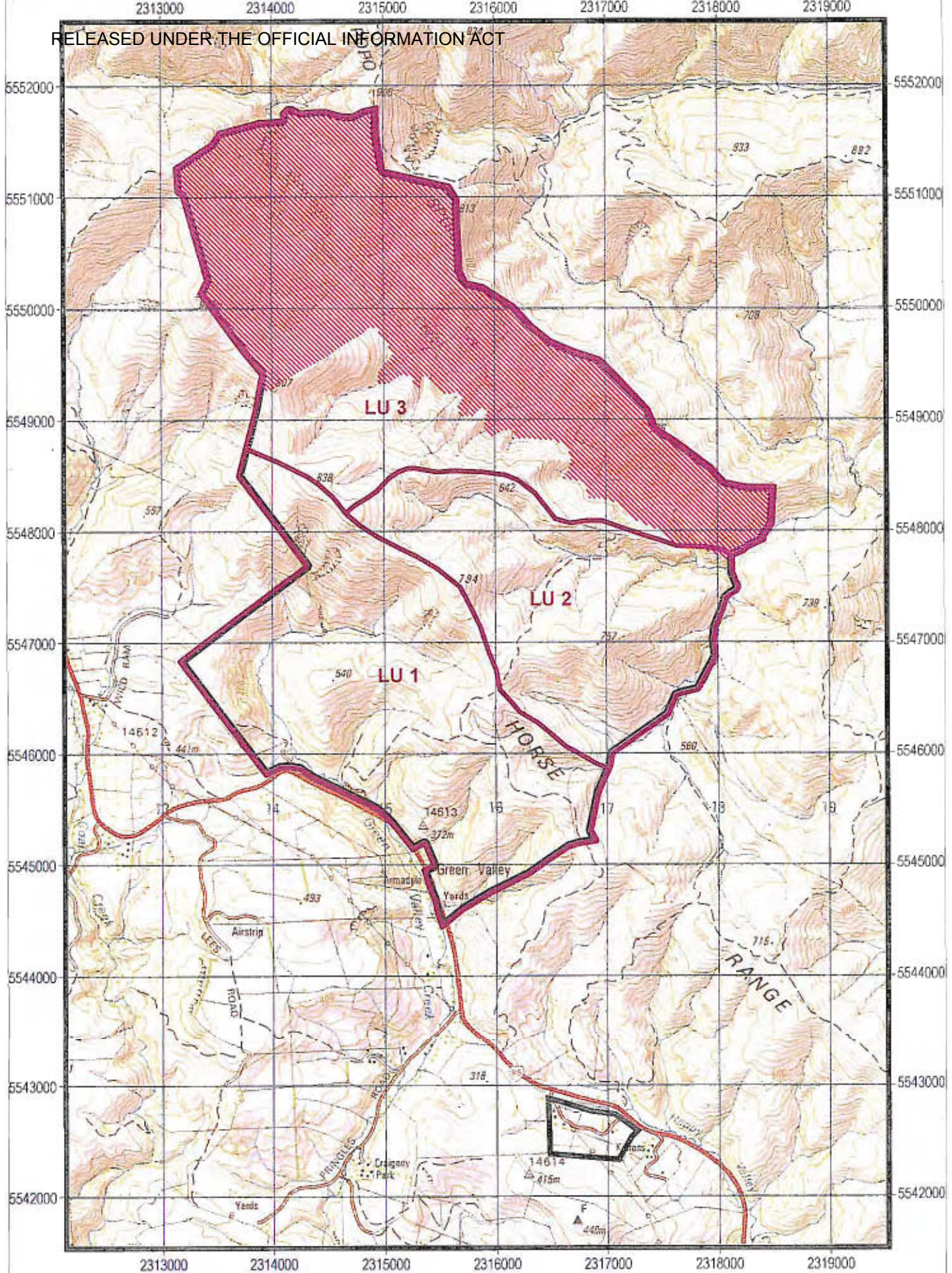
4.2.1 Topographical / Cadastral Caithness Pastoral Lease

-  Pastoral lease
-  Marginal strips
-  Covenants
-  Conservation Resources

500 0 500 1000 Meters



NZMS 260 142



4.2.2 Landscape units and significant landscape values Caithness Pastoral Lease

Area of significant landscape value

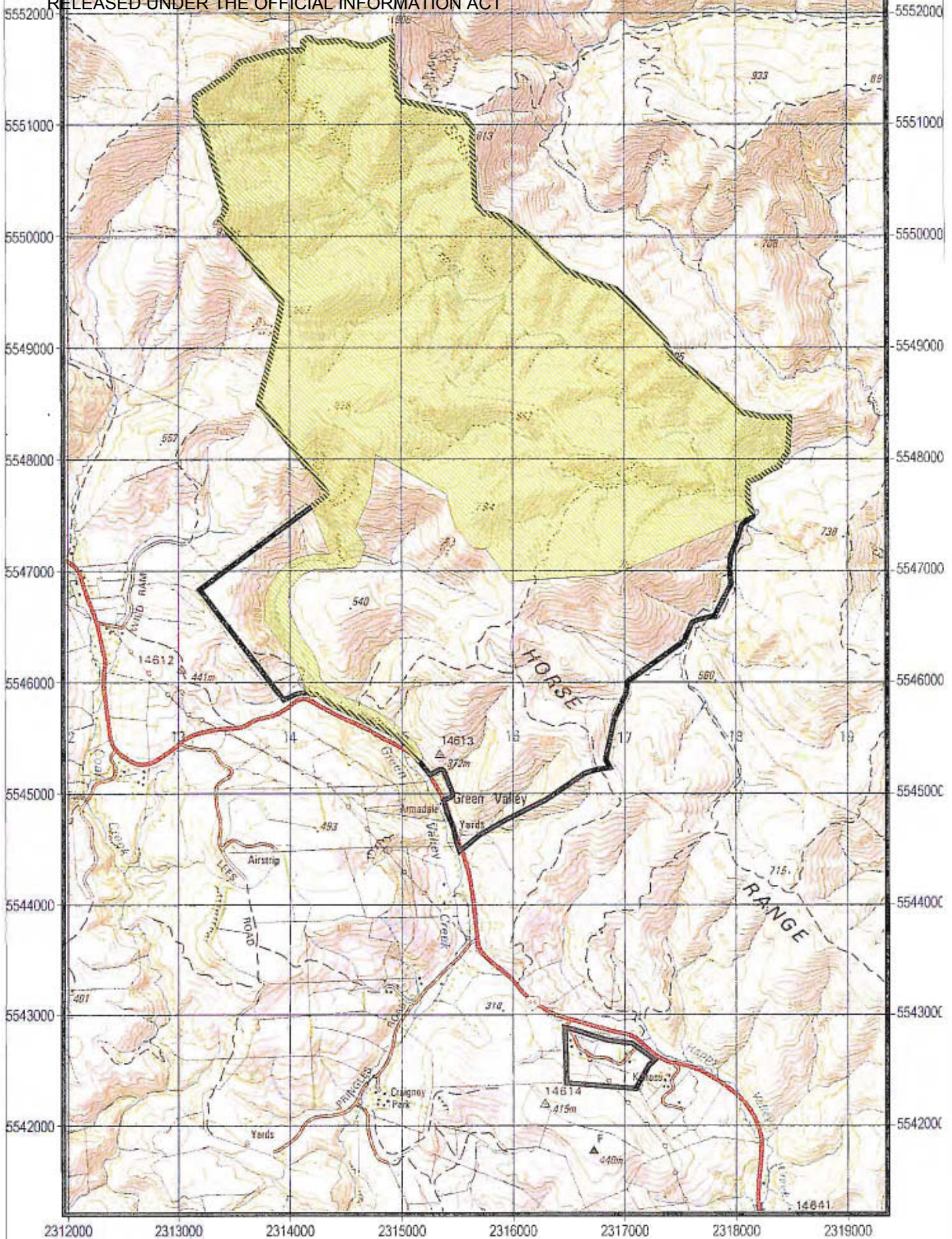
Landscape units

500 0 500 1000 Meters



2312000 2313000 2314000 2315000 2316000 2317000 2318000 2319000

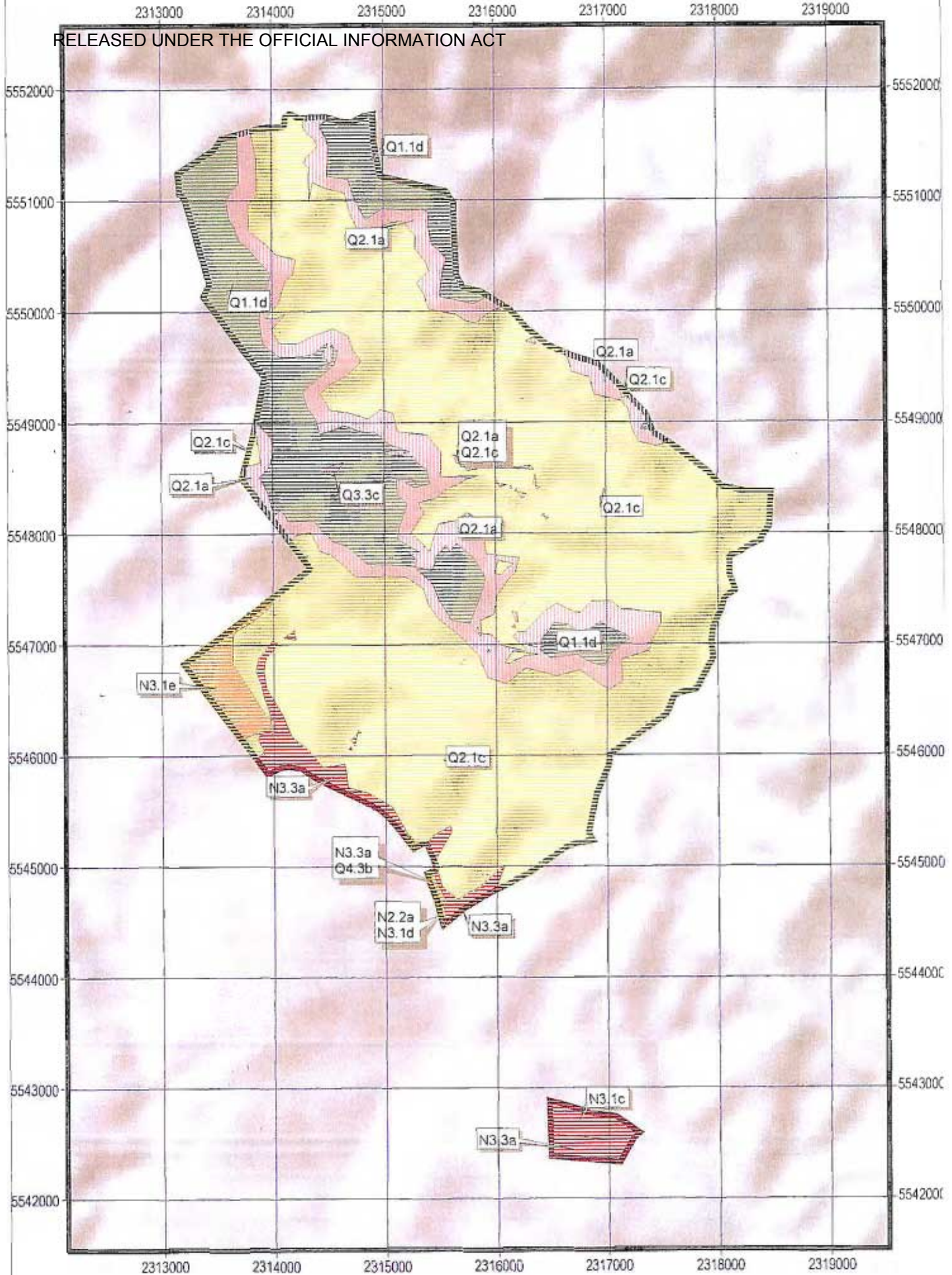
RELEASED UNDER THE OFFICIAL INFORMATION ACT



4.2.3 Significant Ecological Values Caithness Pastoral Lease

500 0 500 1000 Meters





- LENZ categories**
- Acutely Threatened
 - Critically Underprotected
 - Chronically Threatened
 - At Risk
 - Underprotected
 - Unprotected

4.2.4 LENZ Caithness Pastoral Lease

500 0 500 1000 Meters



4.3 Photographs

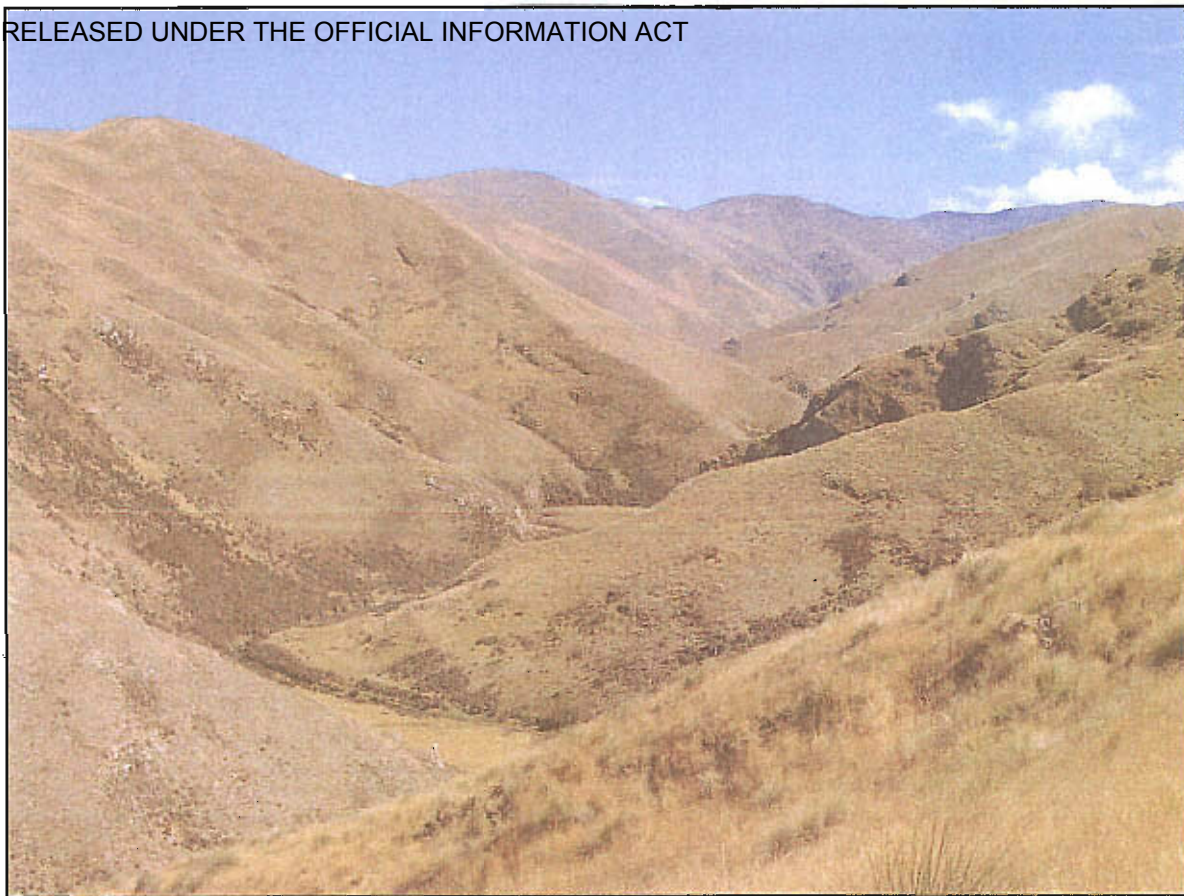


Photo 1: Looking north up Jimmys Creek from GR I42 180 484. The furthestmost track on the skyline ridge approximates the lease's northern boundary.



Photo 2: The continuation of the riparian shrublands in the lower section of Jimmys Creek.

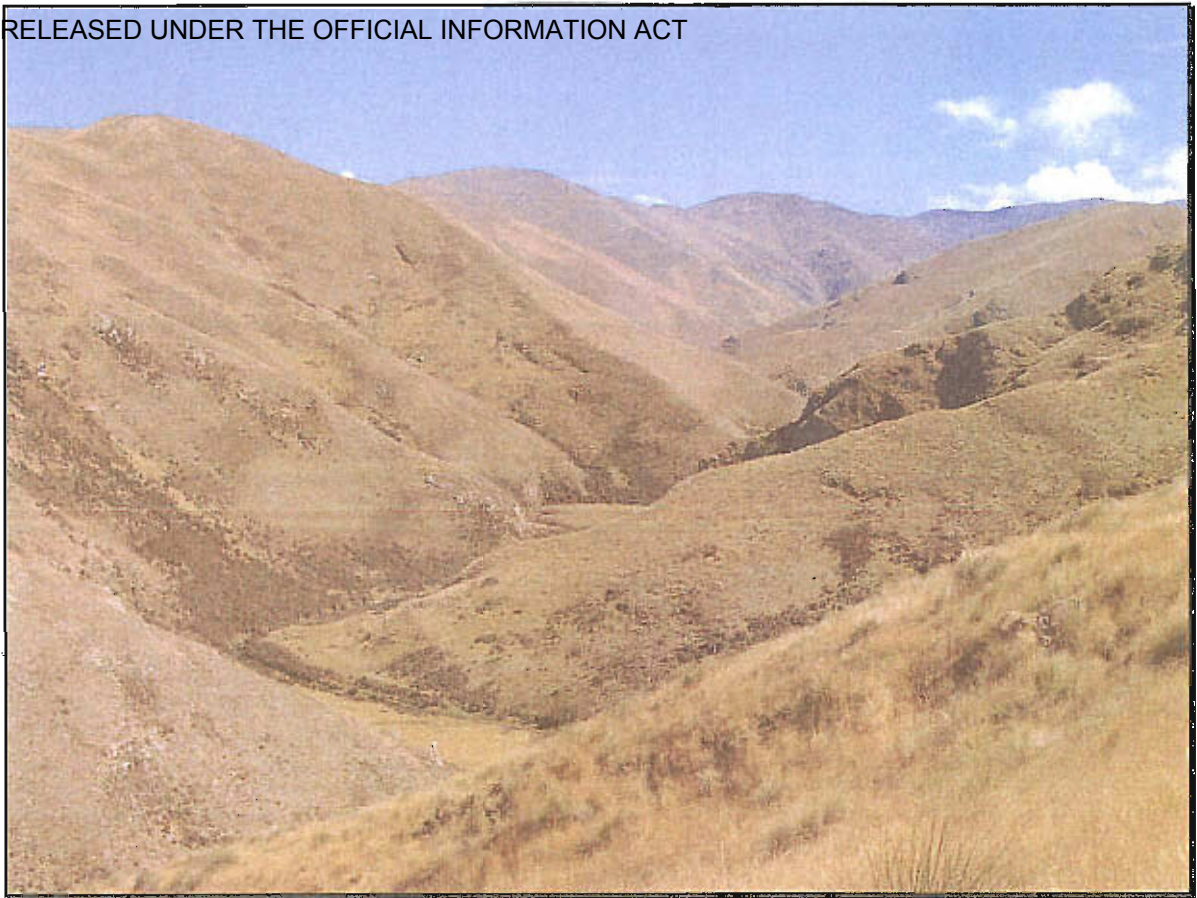


Photo 1: Looking north up Jimmys Creek from GR I42 180 484. The furthestmost track on the skyline ridge approximates the lease's northern boundary.



Photo 2: The continuation of the riparian shrublands in the lower section of Jimmys Creek.

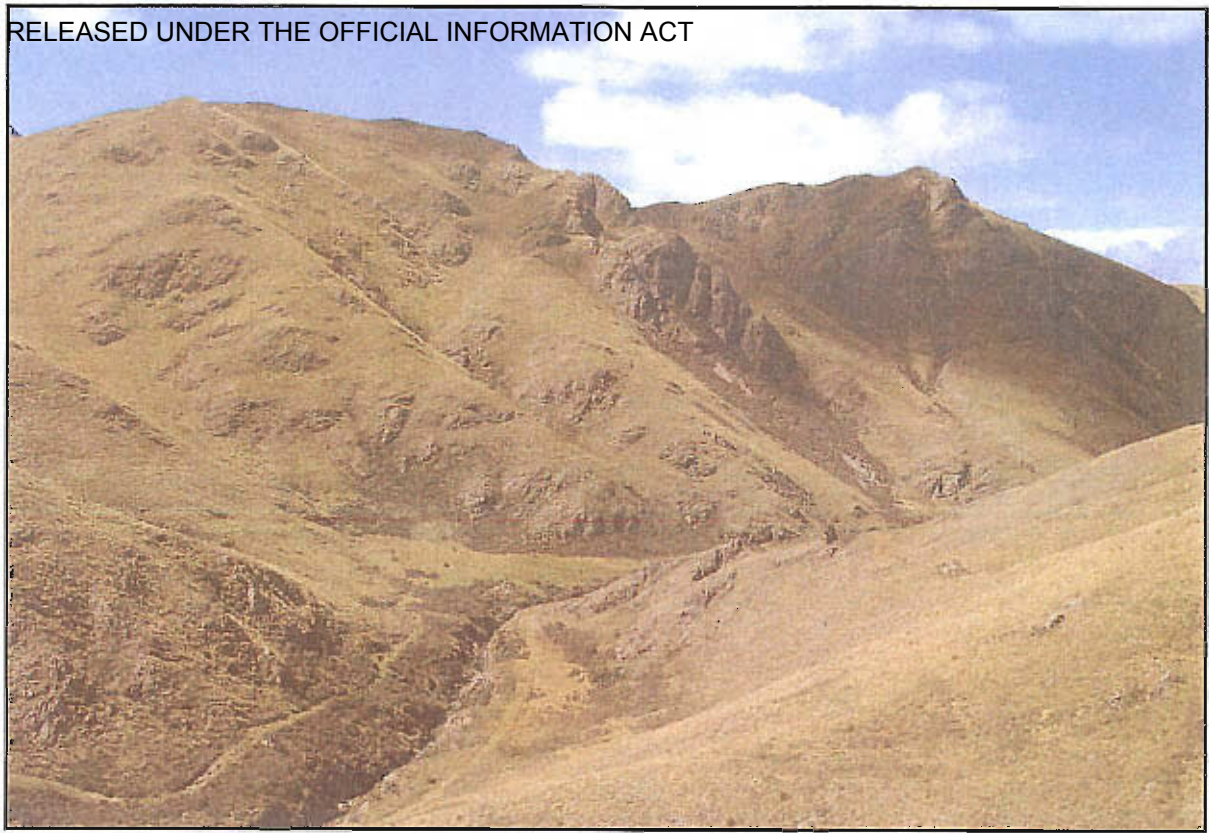


Photo 3: The scree and bluffs in this area act as significant fire refuges and supports a *C. propinqua* dominated shrubland with frequent *C. rigosa* and large bare rocky areas, some of which are mossy. The large scree at the right of the photo is the only site on the lease where *Corokia cotoneaster*, *Scandia geniculata*, *Senecio wairauensis*, *S. glomeratus*, *Coprosma crassifolia* and the lawyer *Rubus* var. *schmideliodes* were recorded. The intact nature of the riparian margins is highly likely to contribute to the waterway's healthy and abundant aquatic fauna.



Photo 4: Looking down Jimmys Creek from the lease's northern boundary. Bluffs within the face on the true left support good populations of *Chionochloa rigida* grassland, speargrass (*Aciphylla aurea*), the 'at risk' turpentine shrub *Dracophyllum uniflorum* var *frondosum*, *G. grisea* 'gradual decline' and *C. hookeri* 'sparse'.

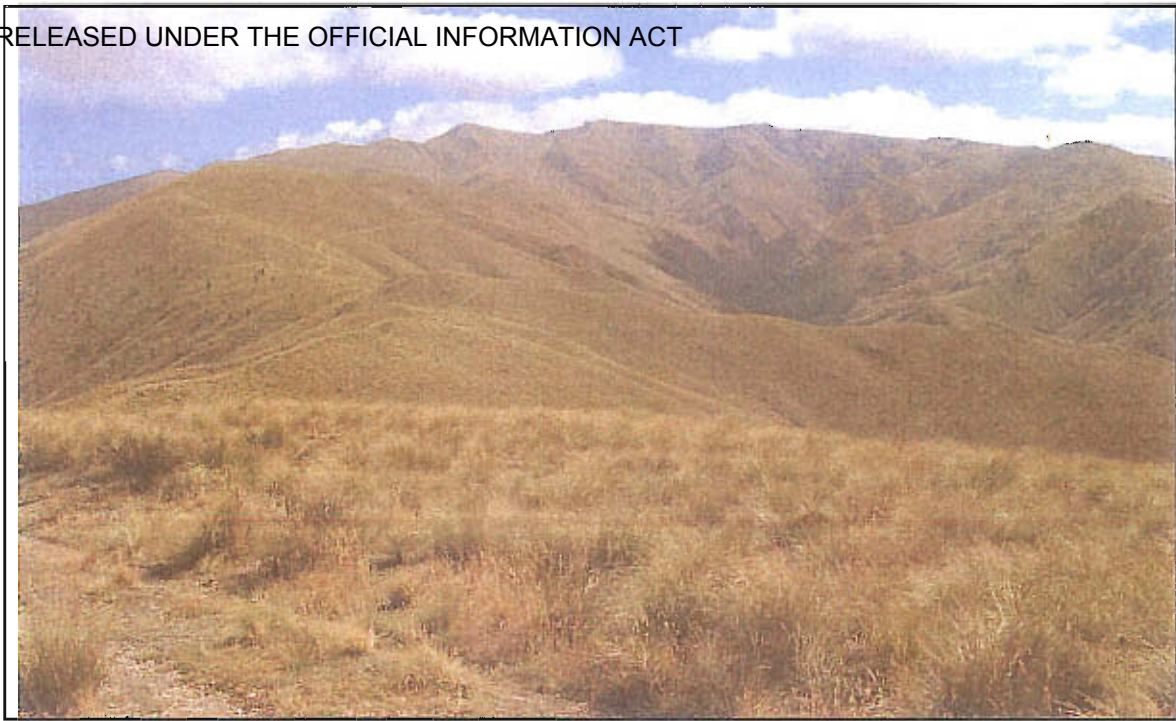


Photo 5: Looking north from GR I42 144 485. Narrow-leaved snow tussock is dominant with blue tussock (*Poa lensoi*), speargrass, matagouri, *Pimelea pseudohylli* and *P. traversii* comprising important components.



Photo 6: Taken again from GR I42 144 485, looking west. The immediate skyline ridge approximates the lease's northwestern boundary.

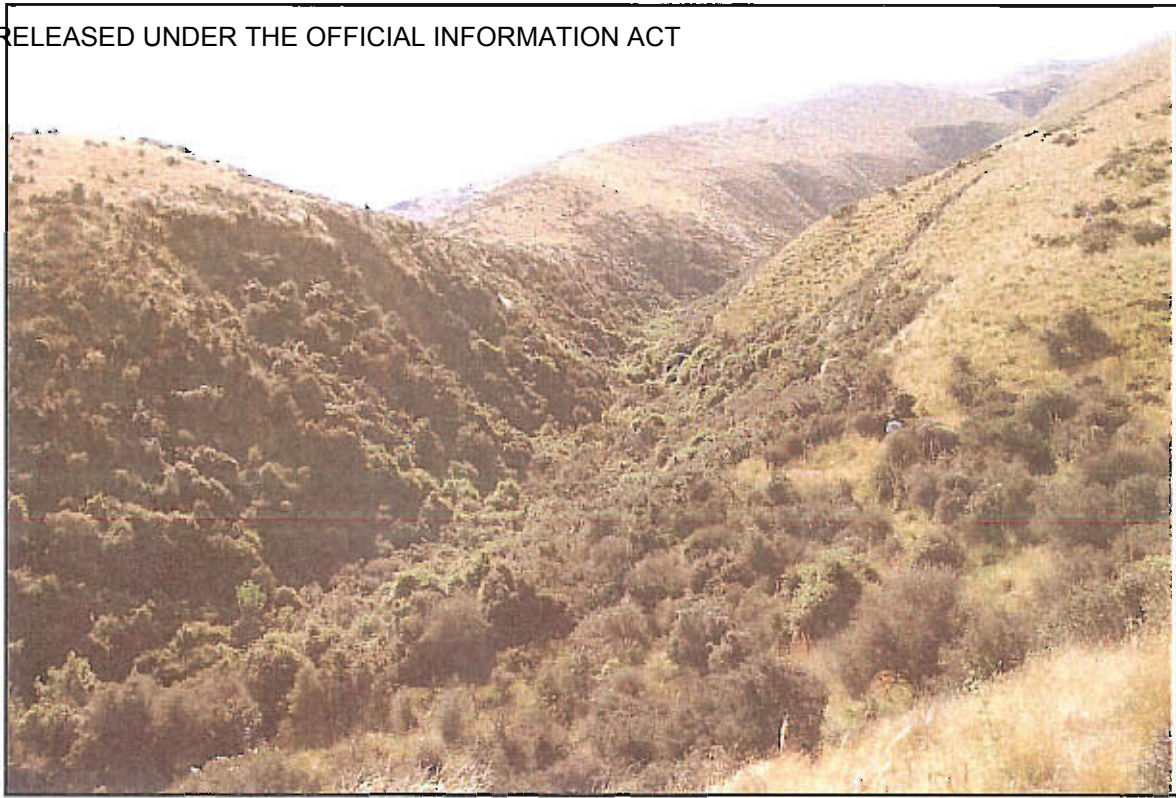


Photo 7: A shrubby gully centred on GR I42 144 474 that contains good populations of *Fushsia perscandens* and wineberry (*Aristotelia serrata*) mixed with *C. propinqua*, matagouri and occasional *C. rugosa* and *O. bullata*. Both *Fushsia perscandens* and wineberry are uncommon in the area.