
**DOC REPORT ON TENURE REVIEW OF THE
KNOBBIES PASTORAL LEASE (P129) UNDER PART
2 CROWN PASTORAL LAND ACT**

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PART 1

1.1 INTRODUCTION

The lessee of The Knobbies pastoral lease has applied to the Commissioner of Crown Lands for a review of the property's pastoral lease tenure. This property is also known as "Horseshoe Station".

The Knobbies pastoral lease (4898 hectares) is made up of three distinct blocks. Two of the blocks which comprise the most productive farmland lie on the southern flanks of the Knobby Range. Lake Roxburgh forms the western boundary of these blocks. A "wedge" of the neighbouring Cairnhill pastoral lease divides these two blocks into separate parcels. The western portion of the second block lies in the headwaters of Speargrass Creek which drains into the Manuherikia catchment. Gordon Peak (1004m) is the highest point on the pastoral lease. For the purpose of this report these blocks are collectively referred to as The Knobbies blocks. A third and geographically separate block is also part of the pastoral lease. This area referred to as The Onslow Block comprises 1728 hectares and lies to the north west of Lake Onslow. It adjoins the western boundary of the Manorburn Conservation Area. The homestead is located on McNeish road which runs off the Knobby Range Road.

The property is located in the Central Otago Ecological Region and the Manorburn Ecological District and is largely within the Knobby Land System. The parts of the property lying to the east of the Knobby Range crest including The Onslow block are within the Greenland Land System. A Protected Natural Areas Survey (PNA) of the ecological district was carried out during the summer of 1988/89. A final report was published in 1992. At the time of the survey, access was not granted to the property; therefore it was not surveyed for PNAP purposes.

A variety of specialists from the Department of Conservation visited The Knobbies as part of this tenure review exercise in April 1999.

No parts of the lease are currently subject to protection for conservation purposes.

PART 2

INHERENT VALUES: DESCRIPTION OF CONSERVATION RESOURCES AND ASSESSMENT OF SIGNIFICANCE

2.1 Landscape

For this assessment the property has been divided into four landscape units with the boundaries being defined principally by changes in land-use and physical features.

The broad geological setting for this pastoral lease is part of Central Otago where all the block ranges (Old Man Range, Flat Top Hill and the Knobby Range) have a strong north-northwest orientation. This distinctive pattern is reinforced by the entrenched Clutha River valley which forms the western boundary to The Knobbies.

The landscape of the area has been described by McCraw (1965) as a "fretted landscape" which features a rough craggy appearance with a pattern of shallow valleys and low ridges. Numerous rock outcrops stud the valley sides and ridgetops and at wide intervals valleys carry streams.

The interior of the Manorburn Ecological District has special qualities within a regional context. These are frequently captured in books, films, and television advertisements which romanticize the high country and help reinforce the deeply felt attachment that many people have for the South Island high country.

LANDSCAPE UNIT 1.

This unit incorporates the western slopes that overlook Lake Roxburgh. Unlike most other sections of the lake's entrenched gorge, this unit is characterised by moderate colluvial slopes that step down in a series of small terracettes. The altitudinal range of the unit is between 150m close to the margins of the lake to about 450m along the upper edge of the slope. The southern boundary is well defined by a deep rocky gully.

The drainage pattern consists mainly of a series of incised gullies that penetrate the edge of the adjoining rolling hill country and then drain directly into Lake Roxburgh.

Most of the indigenous characteristics of LU1 have been modified with introduced grasslands now established down to the margins of the lake. A scattering of native shrublands remain on rocky knolls and other areas unsuitable for farm development.

Although the lower half of these slopes cannot be seen from State Highway 8, LU1 is nevertheless an important part of the overall lake corridor. This unit's vulnerability to further change would primarily be through the introduction of man-made elements near the water's edge.

In landscape terms, the traits that measure an area's quality are all moderately low in this unit, as much of it has been transformed into productive farmland. These human induced changes have created a new landscape pattern with only fragmented natural areas remaining.

Landscape Quality:	Intactness	low
	Coherence	low
	Distinctiveness	moderate
	Visibility	moderate

LANDSCAPE UNIT 2.

This unit incorporates all of the lower hills at the south west corner of the property. It also includes the edge of the uplands.

These rolling hills form the front country of the lease and are characterised by a series of flat low ridges orientated in a north south direction. Separating these ridges are a series of rocky steep sided gullies. A wide curving U-shaped valley terminates in the centre of these rolling hills, in the form of a wide bowl. The southern boundary of the LU is defined by a deep gully which drains directly into Lake Roxburgh. This gully features a series of small pools and rapids which flow between narrow rocky buttresses. The eastern boundary is the base of the southern Knobby Range.

As with LU1, ease of accessibility via the Knobby Range Road, has resulted in farm infrastructure such as woolshed, yards, and homestead, being nestled in the lowest corner of this unit.

Due to extensive development much of this unit has been converted to farmland with only small vestiges of natural areas still remaining.

Landscape Quality:	Intactness	low
	Coherence	low
	Distinctiveness	low
	Visibility	moderate

LANDSCAPE UNIT 3.

This unit comprises an assemblage of landforms at the southern end of the Knobby Range. This complex topography includes the headwaters of a V-shaped valley, a cross section of the wide U-shaped Speargrass Creek Valley and the western extremity of the Manorburn rolling plateau.

The dominant physical feature of the unit is the Speargrass Creek which features a wide shallow valley floor which is occasionally interrupted by spurs extending out from the parallel ridgelines. The eastern corner of the unit is dominated by mound shaped Gordon Peak which at 1004m is the second highest point in the Manorburn Ecological District.

The head of Mount Campbell Creek on the eastern extremity of the property is perched on the edge of the extensive Manorburn Plateau. The landscape is characterised by the indistinct topography which includes shallow valleys and boggy depressions. This area supports a semi intact red tussock sward. Due to the lack of physical relief, expansive views of prominent natural features such as of Pinelheugh and Gordon Peak can be obtained. The latter rocky knoll forms the southern back boundary of the property.

Although vegetation cover shows signs of deterioration, this part of LU3 is an important part of a broad Landscape Management Zone identified by Smith (1989). The rationale behind this zone being so large, was that this type of landscape is open, elevated,

expansive, and undulating with no clear defined visual catchments (refer to attached LM map).

This unit is vulnerable to further change associated with a continued decline of tussock cover around the edges of the rolling plateau and to further loss of red tussock bordering Speargrass Creek.

Landscape Quality:	Intactness	moderate
	Coherence	moderate
	Distinctiveness	moderate
	Visibility	low

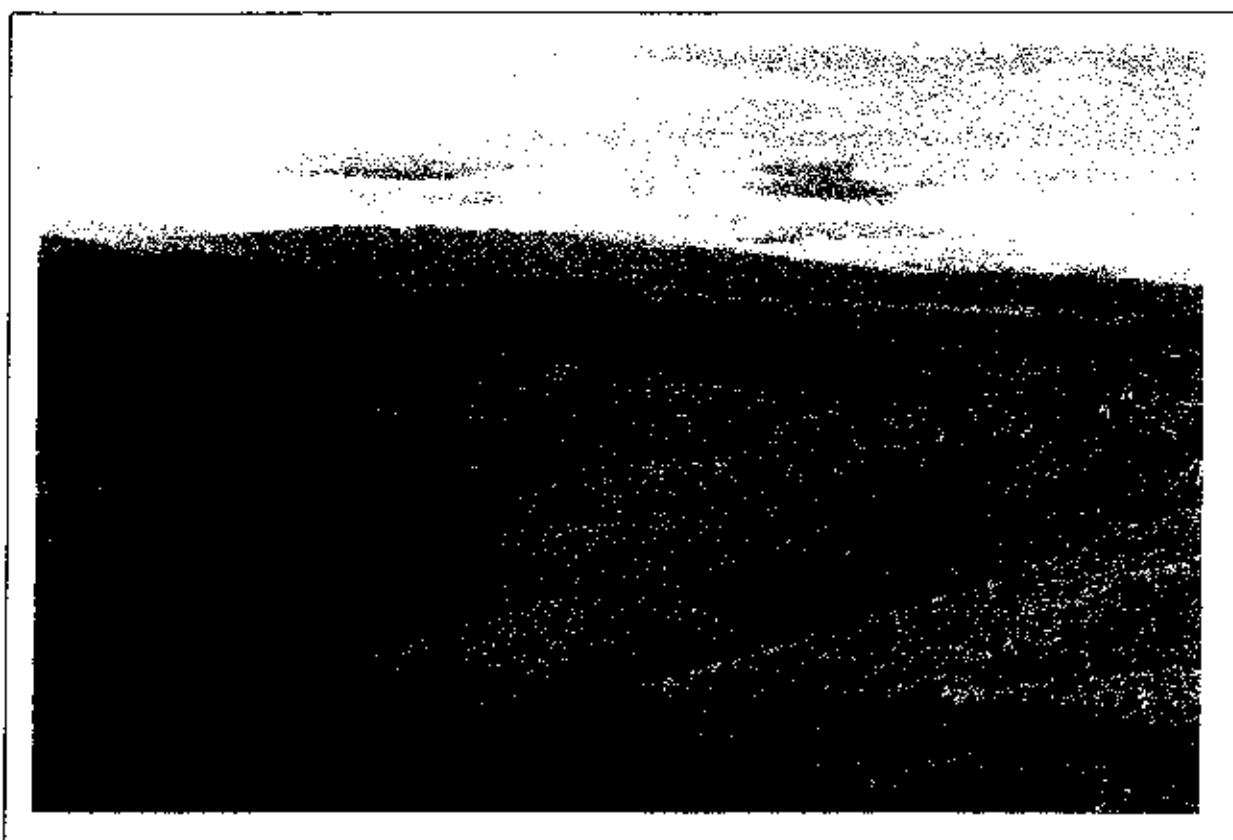


Photo 1. Speargrass Creek – The Knobbies pastoral lease in foreground, Cairnhill in mid ground and Matangi in background (Speargrass Lake)



Photo 2. Red tussocklands in the headwaters of Mount Campbell Creek. Gordon Peak in background.

LANDSCAPE UNIT 4.

This unit encompasses all of The Onslow Block. Although it is surrounded by Crown pastoral leases, freehold and conservation land, the overall landscape character is similar. Collectively these areas form part of a large rolling plateau which comprises the dry interior of the Manorburn Ecological District.

This unit's physical setting is the headwaters and mid section of the North Branch of the Taieri River. The southern boundary of LU4 is defined by an encircling low ridgeline from which point the terrain tilts gently towards the north. A distinctive feature of LU4 is the subdued relief of low rounded ridges separated by hollows, many of which contain finger bogs. Close to the northern boundary the river becomes more confined within a V-shaped valley. The upper margins of this valley are studded with rocky outcrops.

The vegetative cover of this unit is a mosaic of different grasslands with short tussocks occupying the dry sunny slopes. The higher southern corner is tussock clad in snow tussock while poorly drained hollows support extensive red tussock communities.

Although the plant communities have been influenced by pastoralism, the lack of fragmentation conveys unique characteristics that can only be found within high country tussocklands. These features include the subtle variation in colour, texture, and pattern of the various tussock communities.

In a visual context the subdued relief and lack of salient high points gives this unit an impression of spaciousness and vastness which is a special quality of tussocklands.

The muted qualities of this unit make it highly vulnerable to change, particularly when land-use is intensified. Other activities that stand to have an adverse effect on the special qualities of this landscape include insensitive earth disturbances and intrusive buildings.

Landscape Quality:	Intactness	moderately high
	Coherence	high
	Distinctiveness	moderately high
	Visibility	moderate

In many respects this unit typifies the rolling Manorburn plateau with its uninterrupted views, remote qualities, vastness, severity of climate, subtleties of colour, texture, and patterns of the various vegetation communities. Presently a special feature is the lack of man-made elements.

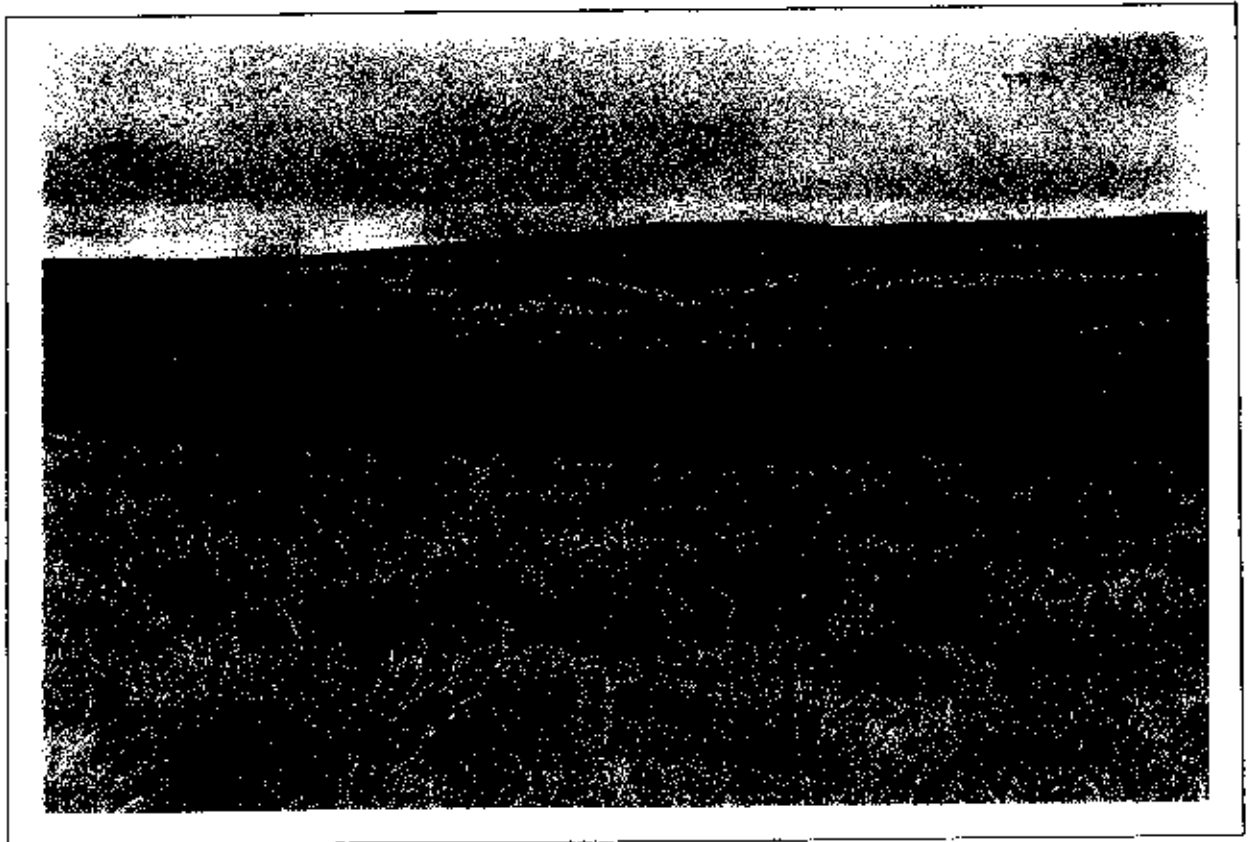


Photo 3. The Onslow Block

Significance of Landscape Values

The extent of inherent values on The Knobbs pastoral lease have been greatly influenced by altitude, aspect, and physical access. The conversion of both LU1 and LU2 into productive farmland is now nearly complete, although the original landscape's "skeleton" of craggy skylines and rocky outcrops is still intact.

From a conservation perspective the most significant landscape of the property is The Onslow Block which is essentially an intact tall tussock grassland.

2.2 Landforms and Geology

The Manorburn Ecological District is an area of block-faulted uplands dissected by incised streams, rocky outcrops and prominent rock outcrops.

(a) Topography.

(i) **The Knobblies Blocks.** The face of the Roxburgh Gorge is moderately steep and rocky. Between the gorge crest and ~ 900m the land form is gently sloping. The Knobby Range is a distinctive block-faulted ridge forming the crest of the property. Tors are present over much of the property where alluvial deposits have eroded away. The valley floors of Mount Campbell and Speargrass Creek headwaters are smooth alluvial land surfaces

(ii) **Onslow Block.** This area comprises an upland plateau surface with rounded and gently undulating topography with a scattering of subdued tors. This represents a relic peneplain surface. Rock outcrops are present but are mostly confined to gullies where they have been exposed by stream erosion.

(b) Geology

Sedimentary rocks which form the basis for Otago schists were deposited in a marine environment during or before the Jurassic. During the Rangitata Orogeny these sedimentary rocks were accreted to the edge of the Gondwana continental margin and metamorphosed to form schist – the base rock of the Manorburn Ecological District.

The late Cretaceous was associated with a period of uplift followed by a long period of erosion and tectonic stability resulting in the formation of a large peneplain which was eventually buried by terrestrial sediments. Blocks of schist impervious to weathering remained engulfed in the regolith to be partially exhumed at a later stage as tors.

Manuherikia group sediments were deposited during the Miocene in a lake basin that covered much of Central Otago. Resistant quartzite boulders known as sarsen stones are thought to be remnants of the basal unit to the Manuherikia Group.

Renewed tectonic activity in the Late Tertiary dissected the peneplain and sediments, resulting in the formation of a fault controlled drainage system.

During inter-glacial periods vast quantities of sediment were deposited in a series of terraces flanking major river systems. Thick alluvium was deposited in low lying areas (for example Speargrass Creek valley floor). Increased runoff during inter-glacial times eroded the landscape and carved the present drainage system.

There are no geopreservation sites present on the property.

(b) Soils (adapted from PNA report description by Dr Peter McIntosh)

There is a climate related sequence of soils, ranging from brown-grey earths (semi arid soils) at lower altitudes, yellow grey earths (Pallic soils) in the intermediate zone, and yellow brown earths (brown soils) on higher altitude higher rainfall land (including The Onslow block).

2.3 Climate

The climate is semi-continental. Annual rainfall on The Knobbs Blocks is in the region of 425 -750 mm (increases with altitude). Winters are cool and frosty. Summers are warm and frequently droughty. Rainfall in The Onslow Block is in the vicinity of 950mm. Prolonged snow lie is confined to upper most crest of property and The Onslow Block.

2.4 Vegetation

2.4.1 Communities Which Retain an Indigenous Component

Knobby Range Block

Short tussock/introduced pasture grasslands

This is the dominant community over all but the highest elevations of this block. Introduced pasture grasses form a dense ground cover with *Poa cita* and *Festuca novae-zelandiae* ranging in abundance from scattered individuals to a light - moderate cover.

***Olearia* shrublands**

Very small pockets of *Olearia lineata* shrubland (up to 3 m tall) occur scattered across areas of gentle terrain. Associated species include matagouri and *Carmichaelia petriei*. Individual *Olearia* shrubs or small groups, are also present in some gullies.

Mixed shrublands

These occur most notably in the gorge of the unnamed tributary of Lake Roxburgh which forms the blocks southern boundary, and in and around scattered rock tors. Prior to the fire they were scattered and disjunct. The fire further reduced their extent and vigour.

Common shrub species include kanuka, manuka, *Olearia lineata*, *Helichrysum aggregatum*, *Coprosma propinqua*, *Corokia cotoneaster*, *Melicope simplex* and *Melicytus alpinus*. Steep rock bluffs have occasional *Hebe pimeleoides* var. *rupestris*. Ground cover which escaped fires is dominated by the ferns *Polystichum richardii*, *Pellaea rotundifolia*, and *Cheilanthes humilis*. The rather local liane *Scandia geniculata* is present beneath unburnt shrubs.

***Chionochloa rigida* tussocklands**

These are very limited in extent and are mostly around the higher elevations of Gordon Peak. The *Chionochloa rigida* component is mostly short stature and low density. With the exception of occasional speargrass, hard tussock and a few native herbs, the inter-tussock flora is strongly exotic with a major component of mouse-ear hawkweed.

***Chionochloa rubra* tussocklands**

These are mostly restricted to small areas within the damp valley bottom of Speargrass Creek and a more extensive area covering approximately 50 ha comprising the head of Mount Campbell Creek at the eastern most extremity of the property. In Speargrass Creek red tussock cover is patchy and exotic species, particularly browntop, dominate between tussocks.

In Mount Campbell Creek the gently sloping valley floor, numerous small gullies and flat poorly drained areas support a largely intact red tussock cover. Some 40 native inter-tussock species including *Neopaxia australasica*, *Oreobolus pectinatus*, *Gonocarpus micranthus*, *Ranunculus multiscapus*, *Carex coriacea*, *Hydrocotyle novae-zelandiae* and *Viola cunninghamii* are present.

More open red tussocklands in Mount Campbell Creek on better drained locations have been invaded by *Hieracium pilosella* to the extent that it is the dominant inter-tussock species at many sites. Native inter-tussock species which have persisted to varying degrees include *Poa colensoi*, *Festuca novae-zelandiae*, *Pimelea oreophila*, *Kelleria dieffenbachii*, *Gaultheria macrostigma*, *Cyathodes fraseri*, *Pentachondra pumila*, *Aciphylla aurea* and *Acaena caesiiglauca*. A scattering of *Chionochloa rigida* tussocks are also present. There is also evidence of hybridisation between *Chionochloa rigida* and *Chionochloa rubra*.

Occasional coral broom (*Carmichaelia crassicaule*) and the native broom (*Carmichaelia petriei*) are scattered throughout the red tussock grassland.

Tors

A number of small tors are also present on the east side Mount Campbell Creek. These areas which represent a refuge from grazing and fire, support some species uncommon elsewhere on the property. These include coral broom *Carmichaelia crassicaule* and *Astelia nervosa*. Common native species present are *Poa colensoi*, *Brachyglottis bellidioides*, *Leucopogon fraseri*, *Asplenium terrestre* and *Scleranthus uniflorus*. The ubiquitous mouse-ear hawkweed is also common.

Onslow Block

This block is predominantly a red tussock-hard tussock community on broad rolling topography characteristic of the Manorburn peneplain. It was unaffected by the 1999 fires. The tussock mosaic reflects past management including fire with an overall trend of improving quality from east to west. Of note is the almost complete absence of tall shrub species. Exposed rock is also rare. The main vegetation types can be broken down as follows:

Dense red tussockland

This is of limited extent and occurs in two distinct situations. Firstly, it occurs around many of the stream margins and drainage courses, and secondly it occurs in a patch fashion close to the Manorburn Conservation Area boundary. Areas in both situations have escaped most recent fires and probably reflect the likely outcome for the remainder of the block if further fires are prevented. Tussocks are commonly 1 - 1.3 m tall and form a dense canopy in some areas. Ground cover is principally *Sphagnum* and other mosses with some exotic grasses.

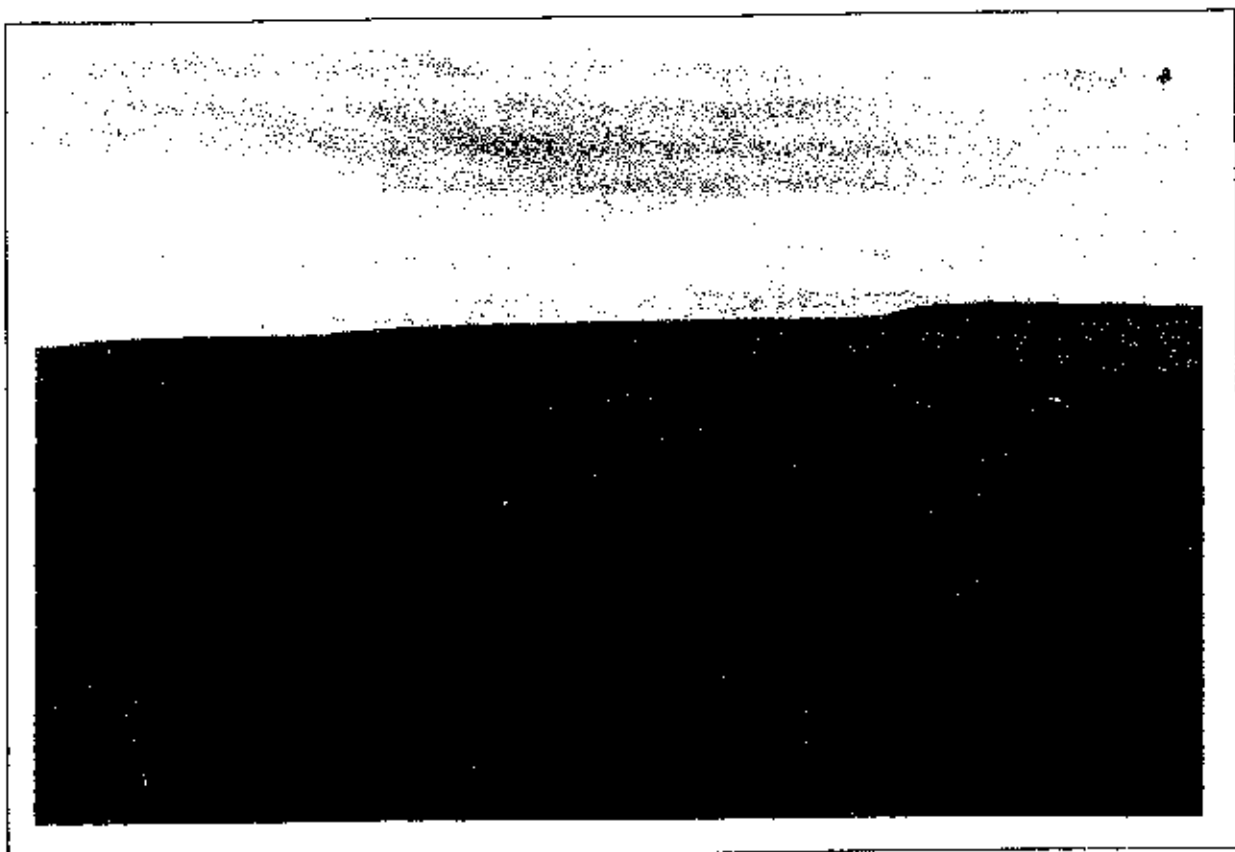


Photo 4. Red tussocklands – Manorburn Conservation Area on the right and the Onslow Block of The Knobbs pastoral lease on the left.

Mixed red/hard tussockland

This is the predominant vegetation type. It may also contain hybrids with narrow leaved snow tussock given their occurrence on adjacent lands. Red tussocks are around .3 - .4 m tall and have resprouted from the margins of burnt bases. Hard tussock is scattered throughout with greatest prevalence on sunny aspects. Characteristic of the inter-tussock species are *Poa colensoi*, *Gaultheria depressa* var. *novae-zelandiae*, *G. macrostigma*, *G. nubicola*, *G. parvula*, *Pentachondra pumila*, *Celmisia gracilentia*, *Lycopodium fastigiatum*, *Raoulia subsericea*, *Gonocarpus micranthus*, *Leucopogon fraseri* and *Aciphylla aurea*.

Hieracium pilosella is locally abundant in eastern parts of the block but its significance reduces greatly towards the west. *H. lepidulum* is also present, but at very low density. Other exotic plants present but of little significance include *Hypochoeris radicata*, *Rumex acetosella*, *Agrostis capillaris*, *Anthoxanthum odoratum*, *Poa pratensis*, *Cerastium fontanum* and *Trifolium repens*.

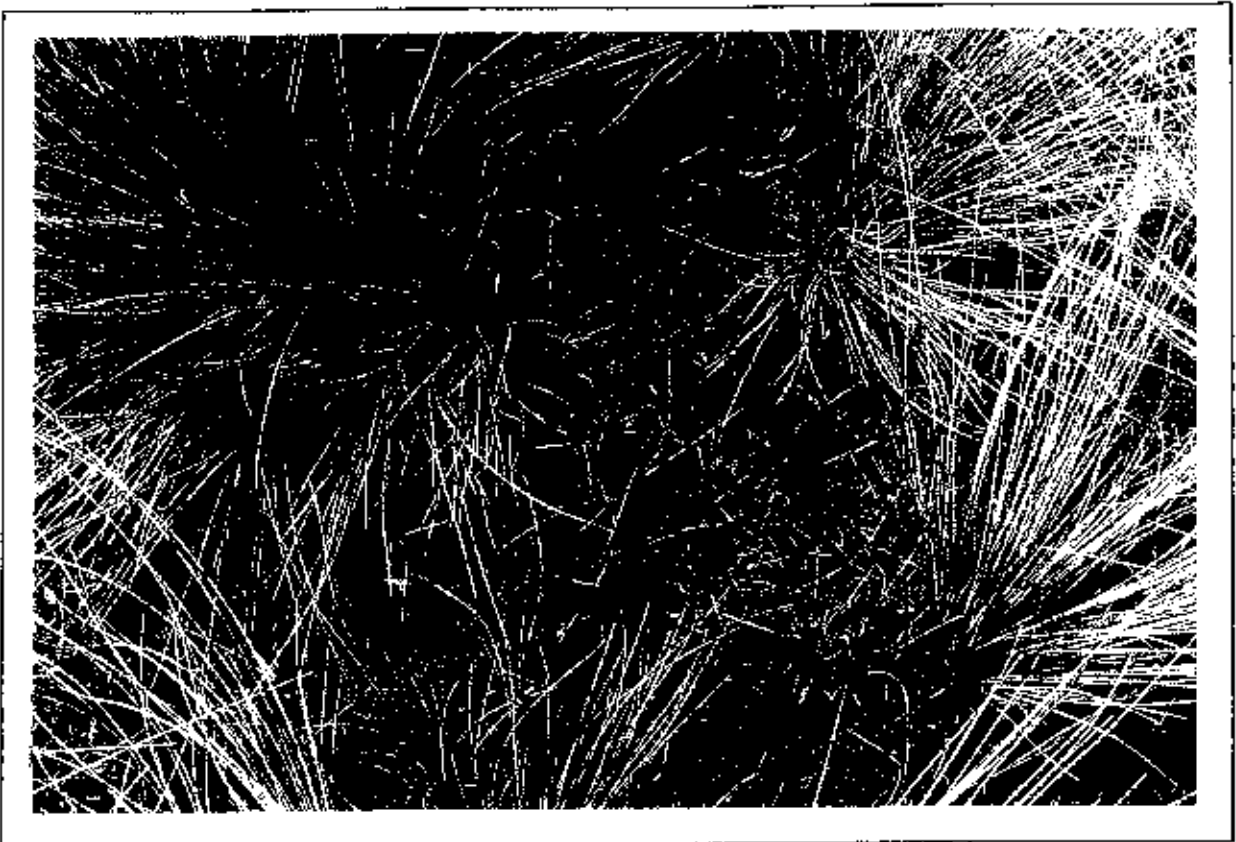


Photo 5. *Hieracium pilosella* mat between *Chionochloa rubra* tussocks.

Short tussocklands

These have a patchy distribution on spur crests, sunny slopes and other sites of concentrated grazing. Inter-tussock species are similar to the above.

Sphagnum bog

Small areas dominated by *Sphagnum* moss occur in terrace depressions and alongside stream margins. Scattered red tussocks are present and the dense ground cover is a diverse species mix including *Gaultheria depressa* var *novae-zelandiae*, *Coprosma perpusilla*, *Pratia macrodon*, *Oreobolus pectinatus*, *Kelleria villosa*, *Plantago lanigera*, *Helichrysum filicaule*, *Uncinia rubra*, *Galium perpusillum*, *Blechnum penna-marina*, and *Nertera halfouriana*.

Sedge/rush wetland

This occupies stream margins and has a variable composition of native and introduced species reflecting hydrological and substrate differences. Taller plants include *Juncus effusus*, *Carex coriacea* and *Festuca rubra* subsp. *commutata*. Ground cover is often dominated by *Sphagnum* moss, although herbs such as *Gunnera prorepens* and *Viola cunninghamii* can be locally common.

Ephemeral wetland

An ephemeral tarn (c. 20 m diameter), dry at the time of inspection, was noted immediately north of the most northern vehicle track. The fine silty substrate of this shallow depression supported a vegetation type not seen elsewhere on the property. The generally sparse and prostrate vegetation is dominated by *Plantago triandra* subsp. *triandra*, *Gentiana grisebachii*, *Hypsela rivulalis*, *Carex* species including *C. berggrenii*.

Turf/heath pavement

Scarp faces, of generally northern aspect with sparse tussock cover, have a predominance of low growing heaths and mat plants. Typical species include *Raoulia subsericea*, *Gaultheria* and *Leucopogon* species, and *Herpolirion novae-zelandiae*. In the south-east this is the principal habitat of mouse-ear hawkweed which reaches 50% cover in localised patches. Elsewhere it is a minor component of the cover.

2.4.2 Problem Plants

Hieracium pilosella is abundant throughout the property, especially on the eastern two thirds of The Knobbies Blocks and in The Onslow Block. This aggressive weed represents a severe threat to production and conservation values. *Hieracium lepidulum* is scattered through eastern parts of the property. Thyme and briar are common on the western portion of the property (especially the lake faces) but do not generally coincide with areas which retain natural values

Significance of Botanical Values

- Little indigenous vegetation remains on the Knobby Range Block as a consequence of the 1999 fire or the combined effects of grazing, oversowing and fertiliser application. That which does remain is restricted to small shrub fragments, short tussock grasslands and heavily modified tall tussocklands. The limited extent of these areas and the influence of exotic species afford these areas a low botanical significance. Remaining areas of shrublands are confined to locations which are almost totally protected from fire and other disturbances
- Although partially modified, Mount Campbell Creek comprises a semi-intact red tussockland. This vegetation type which once covered virtually the entire Manorburn plateau has mostly been converted to a mix of short tussock / exotic grassland or degraded *Hieracium* infested grasslands.
- The Onslow Block is a large and diverse area of predominantly indigenous vegetation dominated by red tussock. Seven discrete vegetation types are identified. Despite a significant *Hieracium* component and past burning, this block retains high botanical values, similar but not identical, to the adjoining Manorburn Conservation Area.

2.5 Fauna

2.5.1 Invertebrate Fauna

The recent fire, weather conditions and the season at the time of the tenure review inspection were not conducive to ascertaining the composition of the insect fauna.

The following insects were found in The Onslow block:

Graphania nullifera (a large moth species distributed widely in indigenous grasslands).

Megadropmus sandageri and *Agonum*: Beetles.

Insects recorded during assessments of the neighbouring Manorburn Conservation Area in 1995 prior to purchase were:

Order	Family	Species
Beetles	Carabidae	<i>Megadromus bullatus</i> <i>Megadromus cf fultoni</i> <i>Oregus aereus</i>
Moths	Noctuidae Tortricidae Crambidae Geometridae	<i>Graphania nullifera</i> <i>Eurythecta leucothrinca</i> <i>Scoparia apheles</i> <i>Dasyuris partheniata</i>

Significance of Invertebrate Fauna

The beetles present are at the top of the insect food chain and their presence suggests that the native insect fauna of the area is intact. Moth species present are representative of drylands and wetlands of high naturalness.

2.5.2 Herpetofauna

The past distribution of the endangered grand and Otago skinks (*Oligosoma grande* and *O. ottagense*, respectively) included most of central Otago (Hardy 1977, Thomas 1982). The tor habitat on The Knobbs is likely to be/have been suitable for both of these rare skinks, based on research from Macraes Flat. The Knobbs may well have supported the rare grand and Otago skink present in historic times, but these skinks have not been detected in the vicinity since the 1960's (Whitaker 1986), and no sign of grand or Otago skinks was found during a thorough search of the area in 1985 Whitaker (1986).

Four sites were surveyed on The Knobbs for resident skinks and geckos. Both burnt sites and unburnt sites were investigated. Methods included lifting of rocks and scanning ahead for moving or basking lizards. Crevices were also searched for both lizards and droppings.

Site 1. NZMS 260-G43 232 267 (The Knobbs Block)

This burnt site at 480 m was surveyed on April 14th 1999 during fine, but cold weather. It comprises large rock tors surrounded by a depleted tussockland. Fruiting shrubs provide an abundant food source to resident geckos. *Hoplodactylus* "Otago" (Hitchmough 1998) was abundant at this site.

Site 2. NZMS 260-G43 237 246 (The Knobbs Block)

This site comprising burnt, steep gorgy stream sides at the southern end of the property was surveyed on April 14th 1999 during fine, but cold weather. The sunshine during the search was patchy, and no active lizards were observed. Again, *Hoplodactylus* "Otago" was common. A single *Oligosoma maccanni* was located beneath a schist slab.

Site 3. NZMS 260-G43 412 151 (Onslow Block)

The site was surveyed in cold and wet conditions on April 15th 1999. The area had been burnt 2-3 summers before this survey. No active skinks were observed. Three *O. maccanni* were located beneath a log in the south west corner of the block. A skink was sighted in the centre of this block. Although it was not identified, it is likely to be *Oligosoma nigriplantare polychroma*, a species which could be expected to inhabit this site.

Site 4. NZMS 260-G43 415 165 (Onslow Block)

This site was surveyed in cold and wet conditions on April 15th 1999. This site had been burnt 2-3 summers before this survey and the red tussock was still recovering. Two *O. maccanni* were found beneath a rock.

Fire as a threat to resident skinks and geckos

There was a clear decrease in the abundance of *O. maccanni* and *H. "Otago"* in burnt areas directly adjacent to unburnt areas (Site 1 and 2). It is possible, although unlikely, that many animals migrated to nearby safe areas during the fire thus artificially elevating the abundance in the surrounding area. However it is more likely the fire killed many skinks and geckos directly, thus lowering their abundance in the burnt area.

No rabbits and few insects (except for woodlice) were found in the burnt area. Fruiting shrubs and cover for lizards within their home range and beyond was also destroyed.

Significance of Herpetofauna

Only two species of lizard were found on the property. *Hoplodactylus "Otago"* is a common and widespread species found on numerous sites managed by DOC. This is also the case for *O. maccanni*, which can reach very high numbers throughout semi-arid Otago, and seems to cope with disturbance associated with land development. A recent report which ranks Otago lizard species in order of importance for conservation action ranks *H. "Otago"* as medium, and *O. maccanni* as a low priority for conservation action (Blair and Tocher in prep.).

No sign or specimens of grand or Otago skinks were found during this search.

2.5.3 Avifauna

No native birds were sighted during the tenure review inspection; however the weather was cold, windy and cloudy for much of the time. Three New Zealand falcon were recorded at a later date on the Lake Onslow Road in the vicinity of The Onslow Block. These birds require a large range and almost certainly utilise this area (and the neighbouring Manorburn Conservation Area) for part of their habitat requirements.

Significance of Avifauna.

Falcon are a category B threatened species (second priority threatened species) (Molloy & Davis 1994).

2.5.4 Aquatic Fauna

The NIWA Freshwater Fisheries Database holds no records for this property. However there are records for brown trout and common bully from nearby The Onslow block, further down the North Branch of the Teviot River. There are also records for the neighbouring Manorburn Conservation Area for koura (freshwater cray fish), rainbow trout and an unidentified non-migratory galaxiid.

The closest records for The Knobbs Range block are for the mouth of Butcher's creek, (G43 209 163), for longfin eel and brown trout.

Nine sites were fished on this property, six in the North Branch Teviot River and its tributaries, two in the Speargrass Creek catchment and one in a stream running directly into Lake Roxburgh. No native fish were found. The only fish species recorded was brown trout, which was present at four of the sites fished. There were no fish present at

The other five sites fished. Several other creeks were dry at the time of the visit, including Fourteen Mile Creek at map reference G43 236 284.

Sites Fished

G43 451 192 Brown trout.

G43 443 198 Nil.

G43 446 188 Nil.

G43 426 177 Brown trout.

G43 221 159 Brown trout.

G43 432 146 Brown trout.

G43 293 267 Nil.

G43 316 278 Nil.

G43 244 259 Nil.

Significance of Aquatic Values

Survey results suggest that aquatic values on the property are not of conservation significance.

2.5.5 Problem Animals

Moderate to high numbers of goats inhabit the Roxburgh Gorge faces. Goats were also observed well above the gorge. Parts of The Knobbs Range are moderately to highly rabbit prone (primarily the lower western part of the property). Rabbits are not a problem on the Onslow Block. Pigs inhabit the western part of the property including The Onslow Block. Cats, ferrets and possums are present throughout the property.

2.6 Historic

Recorded sites: The shoreline and faces of the Roxburgh Gorge contain a number of recorded archaeological sites. These all relate to the mining history of the area which dates from 1862 through to the 1930s. This area was originally surveyed for historic sites during 1980 and reported in Harrison (1982).

Only four sites were recorded by Harrison in this area. Three were typical rock shelters and the fourth was the site historically known as the Poplars or the 14 Mile (ibid.:22). This was once a scene of much mining activity in the late 19th century but most of the sites associated with this activity have been inundated by Lake Roxburgh. The location is now a large terrace which has a large number of gums and poplars growing on it. Harrison reported a remnant sod wall at this location, but this was not relocated.

In the vicinity of The Onslow Block there is an area of alluvial mining near where the Lake Onslow road crosses the river. These workings are outside the lease but the two water races that supplied water to the workings start within the lease area.

Significance of Historic Sites

The rock shelters in the gorge are a common site type and are under little threat. They are protected under the Historic Places Act 1993. The water races in the eastern part of the lease are also a common site type.

2.7 Public Recreation

2.7.1 Physical Characteristics

In 1992, DOC compiled a Recreation Opportunity Spectrum for the entire conservancy whereby all areas, regardless of land tenure, were classified and mapped according to setting, activity and recreational experience characteristics. The Knobbies has been zoned as "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 are desirable to give access to high country tussock grasslands and block mountains and more rugged remote areas."

2.7.2 Legal Access

There is a network of formed and unformed legal roads in the Knobby Range area. The road to the crest of the Knobby Range (Knobby Range Road) is a well formed gravel road. A well formed farm track (historic pack track) traverses the crest of the Knobby Range through Cairnhill and beyond to Alexandra. A legal road also corresponds with a well formed farm track which skirts around the head of Speargrass Creek (Knobbies pastoral lease), over the summit of Gordon Peak and southwards back into Cairnhill.

2.7.3 Activities

The property currently receives no regular commercial recreational usage. Lake Roxburgh which forms the eastern boundary of the property receives a moderate level of use by boat owners (both power boats and kayakers). Some goat hunting occurs on the gorge faces. Historic sites on the lake margins with Cairnhill pastoral lease add to the recreational experience of Lake users. The legal road which dissects the property on the crest of the Knobby Range is subject to frequent use by mountain bikers who follow the route to

Alexandra. This route is routinely used by the Goldrush triathlon which is a commercially run event. Four wheel drives also use this route; although the gate providing access to the road is often locked. From the crest of the Knobby Range magnificent views of the Old Man, Dunstan, Remarkables, Hawkdun and St Bathans Ranges can be attained.

PART 3

CONSULTATION AND OTHER PLANS

3.1 Consultation

Conservation resources on The Knobbs were discussed at a meeting with "umbrella" recreation and conservation groups (NGO's) in Dunedin on Tuesday May 18th 1999.

Key points raised at the meeting were:

- Maintain an open space / landscape corridor along the crest of the Knobby Range on grounds that it is a frequently used recreational route which affords fine views (PANZ/Forest and Bird)*.
- Need to apply marginal strips to lake Roxburgh.
- Reserved comment on conservation values in Speargrass and Mount Campbell Creeks until they have visited the area (FMC/Forest and Bird).

*This comment was aimed at the Old Coach Road which is actually on the neighbouring Cairnhill pastoral lease.

3.2 District Plans (Matters of National Importance)

The Knobbs Pastoral Lease is located within the Central Otago District which is currently subject to the provisions of two planning documents; the current plan (the transitional district plan) and the Proposed District Plan. The transitional district plan remains the principle planning document at the present time; however, both documents are used when assessing activities involving the use of natural and physical resources.

Under the transitional Central Otago District plan the entire property is zoned 'Rural 1'. Rural 1 is the zone comprising the District's productive land which is predominantly utilised for intensive grazing, pastoral use, horticulture, market gardening etc. Conditional uses include industries ancillary to farming and other primary industries.

Section 6c of the RMA (1990) requires council to recognise and provide for protection of indigenous vegetation and significant habitats of indigenous fauna, as a matter of national importance.

With respect to the proposed Central Otago District Plan district plan released for public submissions in 1998 the document states that the council shall:

- (a) Encourage and advocate to DOC that the department negotiates directly with landowners whose properties may contain areas of significance worthy of protection.
- (b) Encourage and advocate to Central Government, that in consultation with affected lessees, areas of significance be appropriately protected through the tenure review process.

- (c) Encourage land owners to provide voluntary protection and enhancement for such areas.
- (e) Review the extent to which significant areas are protected by being included in the conservation estate or made subject to restrictions to protect natural values once the tenure review is complete or when the district plan is reviewed, whichever is earlier.

Only areas with current formal protection have been identified as areas of significant natural value. For this reason no such areas are present on The Knobbs.

Controlled activities in the proposed plan residential activities, subdivision and retail activity. There are a number of standards which provide the basis for the other types of activities. Restricted Discretionary activities include activities in breach of standards on tree planting, storage and signs. Discretionary activities are those which breach standards on residential activities, traffic generation, earthworks and outstanding and significant landscapes. Non-complying activities are those which breach standards relating to significant indigenous vegetation, habitats of indigenous fauna and wetlands (matters of national importance).

3.3 Conservation Management Strategies

The Otago Conservancy of DOC has prepared a Conservation Management Strategy (CMS) which was approved by the Minister of Conservation in August 1998.

The CMS identifies 41 special places of conservation interest in Otago Conservancy. The flanks of the Roxburgh Gorge are within the vicinity of the "Drylands Special Place.

The CMS objectives for the Drylands Special Place are "To protect a full range of Central Otago and lowland semi-arid indigenous landscapes, ecosystems and species along with significant historic resources associated with them, and to provide and manage appropriate recreational opportunities in those settings.

Key implementation methods are:

- (a) Attempt to negotiate protection of carefully selected examples of important native ecosystems and key historic sites in the area as they become available, particularly in the context of pastoral lease tenure reviews.
- (b) Protection of significant natural and historic resources in the area will be advocated through the Resource Management Act and other statutory processes.

The eastern portion of the property including the Onslow Block lies within the Upper Manorburn Special Place. The objective for this Special Place is "to protect the special landscape and biodiversity resources of the area, and to maintain the historic resources of land administered by the department, while providing for appropriate public access".

Key implementation objectives relevant to The Knobbs pastoral lease are:

- (a) Pastoral lease tenure review on adjacent or nearby properties may provide opportunities to acquire management of additional areas of significant natural and historic resources.
- (b) Advocacy under the Resource Management Act and other statutes will be maintained to achieve protection of significant natural and historic resources. Public awareness of the special attributes of the Manorburn and the threats to them will be improved.
- (c) Further survey of streams for in-stream values including galaxiid species.

PART 4 FOR OFFICIAL USE ONLY

RECOMMENDATIONS AND JUSTIFICATION

4.1 Recommendations

- 4.1.1 That the proposals described below be submitted to the CCL's Agent, during the consultation process on the preliminary proposal for this tenure review, as representing the views developed under delegated authority from the Director-General of Conservation.
- 4.1.2 Note that statutory consents will be required before the CCL can include (in the preliminary proposal for this tenure review) the designations set out in paragraphs : below. N/A
- 4.1.3 Note that any disposition of land by the Crown will be subject to the relevant provisions of Part IVA of the Conservation Act.

4.2 Proposals and Justification

4.2.1 Land to be Restored to or Retained in Full Crown Ownership and Control

4.2.1.1 Name: MANORBURN CONSERVATION AREA EXTENSION

Existing Status: Pastoral Lease

Authority: s.35(2)(a) (i) CPLA

Proposal: That an area of approximately 1728 hectares be designated as a Conservation Area for the purpose of protecting natural values and facilitating recreational use to be managed by DOC.

Summary description:

The Onslow Block which lies in the headwaters of the North Branch of the Teviot River between the Manorburn Conservation Area and the Lake Onslow Road comprises a large expanse of rolling red tussock grasslands and wetland vegetation types. The area is dissected by a complex array of shallow water courses.

Justification:

The Onslow Block adjoins the Little Valley Red Tussock Conservation Covenant which forms a small part of RAP Manorburn 2. Protection of The Onslow Block and the adjoining Manorburn Conservation Area goes some way towards protecting the range of features present in RAP Manorburn 2. The need for protection of red tussocklands has

been well aired over recent years. The key reason why strenuous attempts have been made in the past to protect remaining areas of red tussock is that this resilient and attractive species maintains a competitive advantage in areas of poor soil fertility and low pH. These soils are vulnerable to loss of nutrients and structure through burning and to a lesser extent from grazing. Grazing, regular burning and in some areas land development have resulted in the loss of vast areas of red tussock grasslands in Otago and Southland. In many situations red tussock grasslands have been converted into *Hieracium* wastelands of little productive value. The addition of The Onslow Block to the Manorburn Conservation Area stands to increase its viability due to an increased buffering zone and a decrease in edge effects.

In terms of the CPLA the land is characterised by areas that have the following significant inherent values:

1. Sustains the special natural quality and integrity of the High Country landscape, especially the indigenous component.
2. Sustains culturally valued scenic, aesthetic, recreational and historic attributes within a natural High Country landscape.
3. Meets the Protected Natural Area Programme (PNAP) criteria for protection as priority natural areas*.
4. Contributes to the habitats of a threatened species (New Zealand falcon).
5. Makes a special contribution to the overall quality, natural functioning and ecological integrity of significant values.

*The Onslow Block meets criteria adopted for assessing natural areas under the Protected Natural Areas Program. It ranks between moderate and high for 7 primary criteria outlined in the Reserves Act 1977 for assessing the conservation value of a natural area. The following table ranks the area against each of the 7 criteria.

- | | |
|--|-----------------------------|
| • Representativeness: | High |
| • Diversity: | Moderate |
| • Rarity: | High (ecosystem vs Species) |
| • Naturalness: | Moderate to High |
| • Long Term Ecological Viability: | Moderate to High |
| • Size and Shape: | High |
| • Buffering, Surrounding Landscape and Boundaries: | Moderate to High |

Naturalness and long term ecological viability were rated moderate to high due to the prevalence of mouse ear hawkweed. Tall tussock cover will probably largely inhibit this species over time in the absence of grazing and deliberate burning; however this is not a certainty.

- From a recreational perspective the land is a setting of high natural value for outdoor recreational opportunities in the High Country.

Management and boundary issues:

(a) Fencing

The Onslow block is fenced on all boundaries and is subdivided into 2 blocks. Incorporation into the conservation estate will not significantly increase fencing commitments for the Department as the eastern boundary is with the Manorburn Conservation Area, effectively making the fence redundant. Removing of redundant fencing would be advantageous in terms of landscape; however a dozed line adjacent to the fence could form a potential fire break. Consideration should be given to keeping this line clear. The issue of fence removal be left with the Central Otago Area office to resolve.

(b) Grazing

Continuation of grazing would be detrimental to natural values present in the area.

(c) Problem Animals.

The area is not rabbit prone. Low numbers of hares are present. Pigs are present at a level that could be controlled through recreational hunting.

(d) Huts.

Two small huts in fair condition are present in the area at GR NZMS 260 – G43 412 151.

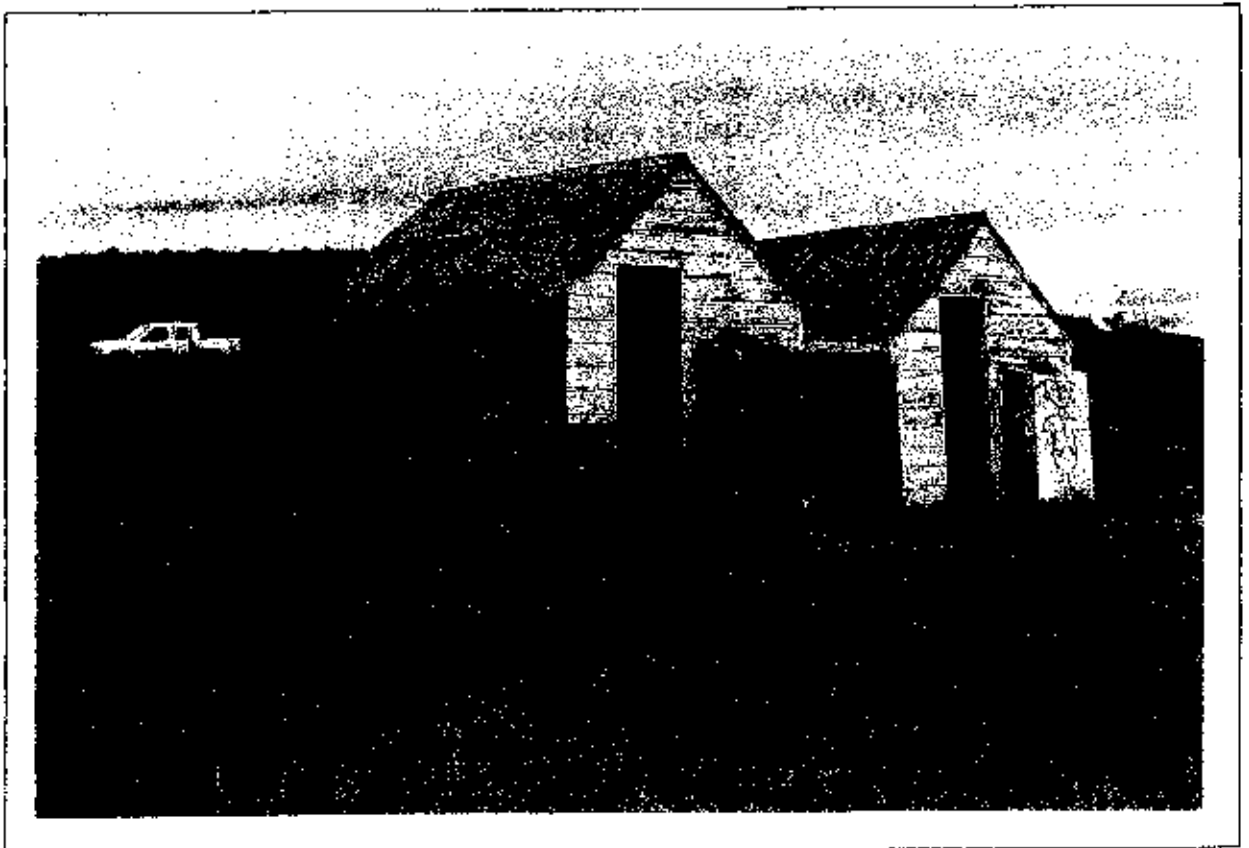


Photo 6. Huts on the Onslow Block

(d) Problem plants.

Hieracium pilosella is abundant; however control will entail destocking and not burning the area. *Hieracium lepidulum* is scattered throughout the block. One *Pinus contorta* at GR 444 197 is present. This lone tree is nearing coning age and should be removed.

(e) Access

Practical legal access to The Onslow Block can be attained from the Lake Onslow Road and from a roughly formed legal road on the southern boundary of the block.

4.2.1.2 Name: MOUNT CAMPBELL CREEK CONSERVATION AREA

Existing Status: Pastoral Lease

Authority: s.35(2)(a) (i) CPLA

Proposal: That an area of approximately 75 hectares be designated as a Conservation Area for the purpose of protecting natural values and facilitating recreational use to be managed by DOC.

Description: The area which forms the headwaters of Mount Campbell Creek is on the eastern margin of the property and the western extremity of the vast Manorburn Plateau. It is the only part of The Knobbs pastoral lease which drains into Mount Campbell Creek. The conservation resources report for Cairnhill pastoral lease recommends that a further 200 hectares lying immediately down stream of this area are also incorporated into the proposed conservation area. The area comprises a gentle basin with a low ridge separating it from the right branch of Speargrass Creek to the west and the West Branch of Little Valley Creek to the east. Much of the area (especially the flat valley floor and numerous shallow gullies) are clothed in red tussock.

The area comprises part of larger block which includes land in the headwaters of the right branch of Speargrass Creek.

Justification: The headwaters of Mount Campbell Creek contain features which sustain the special natural quality and integrity of the high country landscape and therefore has significant inherent values. The area appears to meet criteria for protection as a priority natural area. The head of Campbell Creek represents one of the strongest red tussockland remnants on the Manorburn Plateau. The desirability of protecting remaining low-mid altitude red tussocklands has been well aired over recent years. Red tussock is an attractive perennial grass which thrives in areas with poor soil fertility and low pH (and limited potential for economic pastoral development). These soils are vulnerable to loss of nutrients and structure through burning and to a lesser extent from grazing. These factors (and land development) have resulted in the loss of vast areas of red tussock on the Manorburn plateau and elsewhere in the South Island. In many localities red tussocklands have given way to *Hieracium* dominated wastelands of little productive or conservation value.

In terms of the CPLA the land is characterised by having the following significant inherent values:

1. Sustains the special natural quality and integrity of the High Country landscape, especially the indigenous component.
2. Sustains culturally valued scenic, aesthetic, recreational and historic attributes within a natural High Country landscape.
3. Meets the Protected Natural Area Programme (PNAP) criteria for protection as priority natural areas.
4. Makes a special contribution to the overall quality, natural functioning and ecological integrity of significant values.

*The land meets criteria adopted for assessing natural areas under the Protected Natural Areas Program. It ranks between moderate and high for 5 out of 7 primary criteria outlined in the Reserves Act 1977 for assessing the conservation value of a natural area. If combined with adjoining land recommended for protection on Cairnhill pastoral lease it ranks between high and moderate for all 7 criteria. The following table ranks the area against each of the 7 criteria.

• Representativeness:	High
• Diversity:	Moderate
• Rarity:	High (ecosystem vs Species)
• Naturalness:	Moderate to High
• Long Term Ecological Viability:	Moderate
• Size and Shape:	Low (moderate to high if adjoining land is protected)
• Buffering, Surrounding Landscape and Boundaries:	Low (moderate to high if adjoining land is protected).

Naturalness and long term ecological viability were rated moderate to high due to the prevalence of mouse ear hawkweed.

Given the paucity of protected red tussocklands, the area merits protection on its representativeness alone. It is considered that in the absence of grazing and deliberate burning, increasing tall tussock cover will serve to exclude or retard invasion of hawkweed. However over as much as a third of the area, *Hieracium pilosella* forms an almost continuous sward. In these areas re-establishment of a red tussock cover will be extremely slow if it happens at all. Invasion by *Hieracium lepidulum* which is rare within the area is a possible future threat.

Management and boundary issues:

(a)Fencing:

The proposed conservation area is fenced on three sides. The short northern boundary of The Knobbies comprises a relatively new #8, 7 wire fence with post and standards

(barbed on top). This fence will become redundant if the small portion of Campbell Creek within The Knobbs pastoral lease becomes part of the conservation area (tenure review is occurring simultaneously on this property). The eastern boundary with Matangi pastoral lease comprises an old but stock proof #8 wire fence with standards. This fence will require annual maintenance checks and may require replacement in the medium term (especially if Matangi were to run cattle). The eastern boundary with Matangi comprises a fair to good #8 6 wire fence with standards and wooden posts. This fence appears to be stock proof but would require regular checking and maintenance. The western boundary of the proposed conservation area is unfenced. 800 metres of new fencing would be required (and an additional 1.5km on Cairnhill pastoral lease) to make the area stock proof.

(b) Grazing:

Grazing should cease following the completion of the tenure review and associated fencing.

(c) Problem Animals. Although rabbits appear to be virtually absent from the area, historic burrows provide testament to high numbers in the past. Extensive pig rooting was observed. Consideration should be given to some pig control, although recreational hunting may keep numbers to an acceptable level. Pigs are likely to utilise an area much larger than the proposed conservation area. Periodic inspections will be required to determine numbers.

(d) Weeds. *Hieracium pilosella* represents a serious threat to conservation values in the area. Control of this weed is best achieved through encouraging an improvement in tussock stature and density through destocking; this strategy does not incur management costs. As far as practical fire must be kept out of the area. A summer wildfire would compromise the areas viability as a conservation area. If tussock cover improves over the decades the area will be better able to recover from an accidental fire.

(e) Viability. This area on its own may be too small to function as a viable adequately buffered conservation area. In terms of reserve design, it is important that neighbouring land on Cairnhill pastoral lease recommended for protection in a conservation resources report for that property, forms part of the proposed conservation area.

(f) Access. The most practical access to the area is through Cairnhill pastoral lease. This access route has been recommended as part of the conservation resources report for that property. If the situation arises where the portion of Mount Campbell Creek within The Knobbs pastoral lease becomes a stand alone conservation area, satisfactory access can be gained via an existing legal road which is formed to a 4WD standard.

4.2.2 Land to be Restored to or Retained in Crown Control.

N/A

4.2.3 Existing Reserve

N/A

4.2.4 Existing Conservation Area

N/A

4.2.5 Land Being Disposed of Subject to a Protective Mechanism

N/A

4.2.6 Land Being Disposed of Subject to a Qualified Designation

N/A

4.2.7 Exemption of Variation in a Marginal Strip Width

N/A

4.3 Explanation of Variation in Proposals and Proposal Recommended by NGO's

Proposal Meets the following stated NGO objectives in the following respects:*

- Maintain an open space / landscape corridor along the crest of the Knobby Range – This comment was aimed at the Old Coach Road which is actually on the neighbouring Cairnhill pastoral lease.
- Need to apply marginal strips to lake Roxburgh ✓ (Marginal strips will be addressed through tenure review process).
- Withheld comment on conservation values in Speargrass and Mount Campbell Creeks until they have visited the area (FMC/Forest and Bird).

✓ Indicates that the proposal fully meets NGO recommendations

PART 5 ATTACHMENTS

5.1 Additional Information

5.2 Maps

5.2 .1(i)	Topo/Cadastral - The Knobbies Blocks
5.2 .1(ii)	Topo/Cadastral - The Onslow Block
5.2.2(a)(i)	Biological Values – The Knobbies Blocks
5.2.2(a)(ii)	Biological Values – The Onslow Block
5.2.2(b)(i)	Landscape Values – The Knobbies Blocks
5.2 .2(b)(ii)	Landscape Values – The Onslow Block
5.2.2(c)	Proposed Landscape Management Zone from 1989 Landscape Survey Report
5.2.3(i)	Boundaries – The Knobbies Blocks
5.2.3(ii)	Boundaries – The Onslow Block

5.2 References

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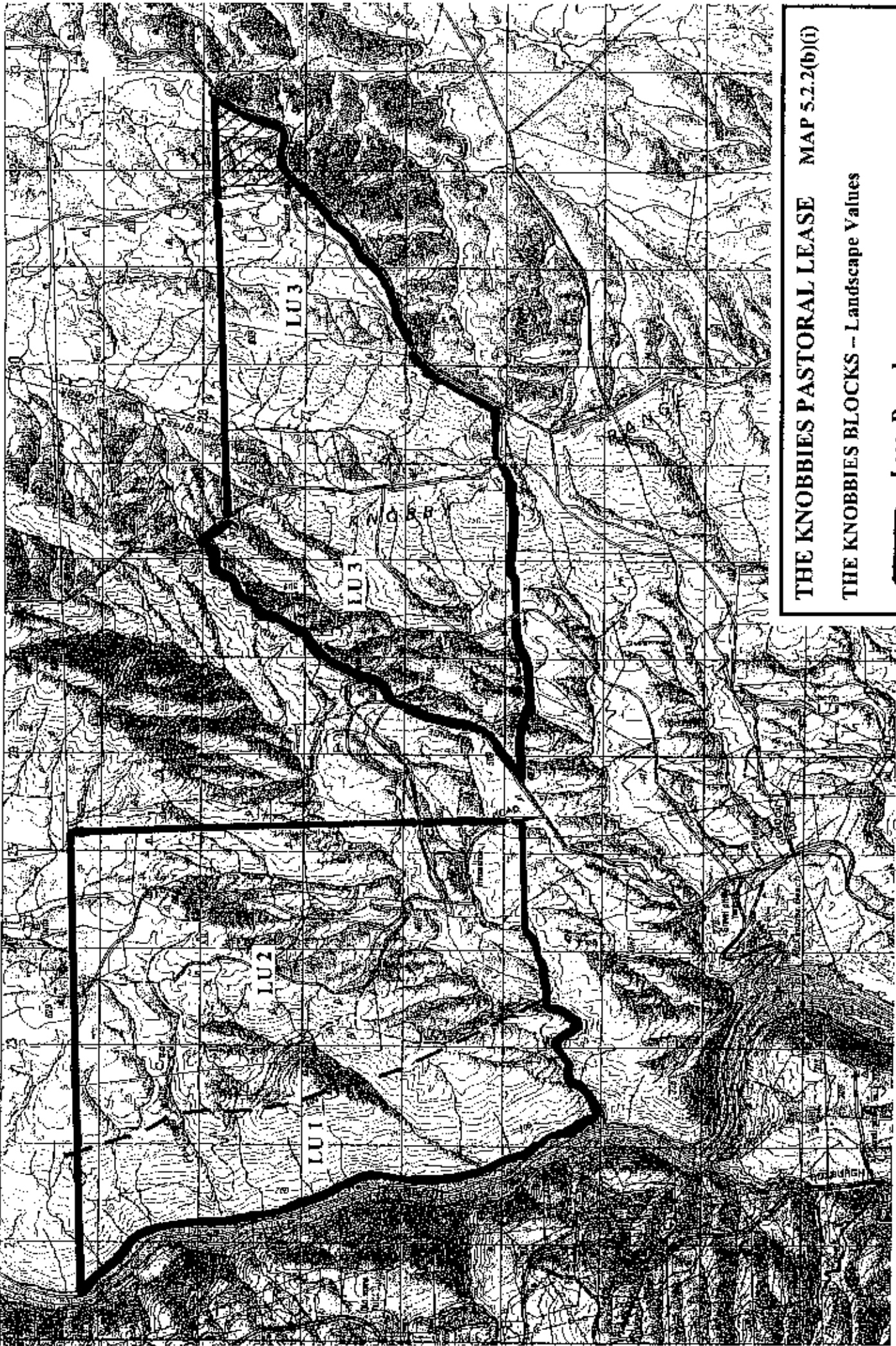
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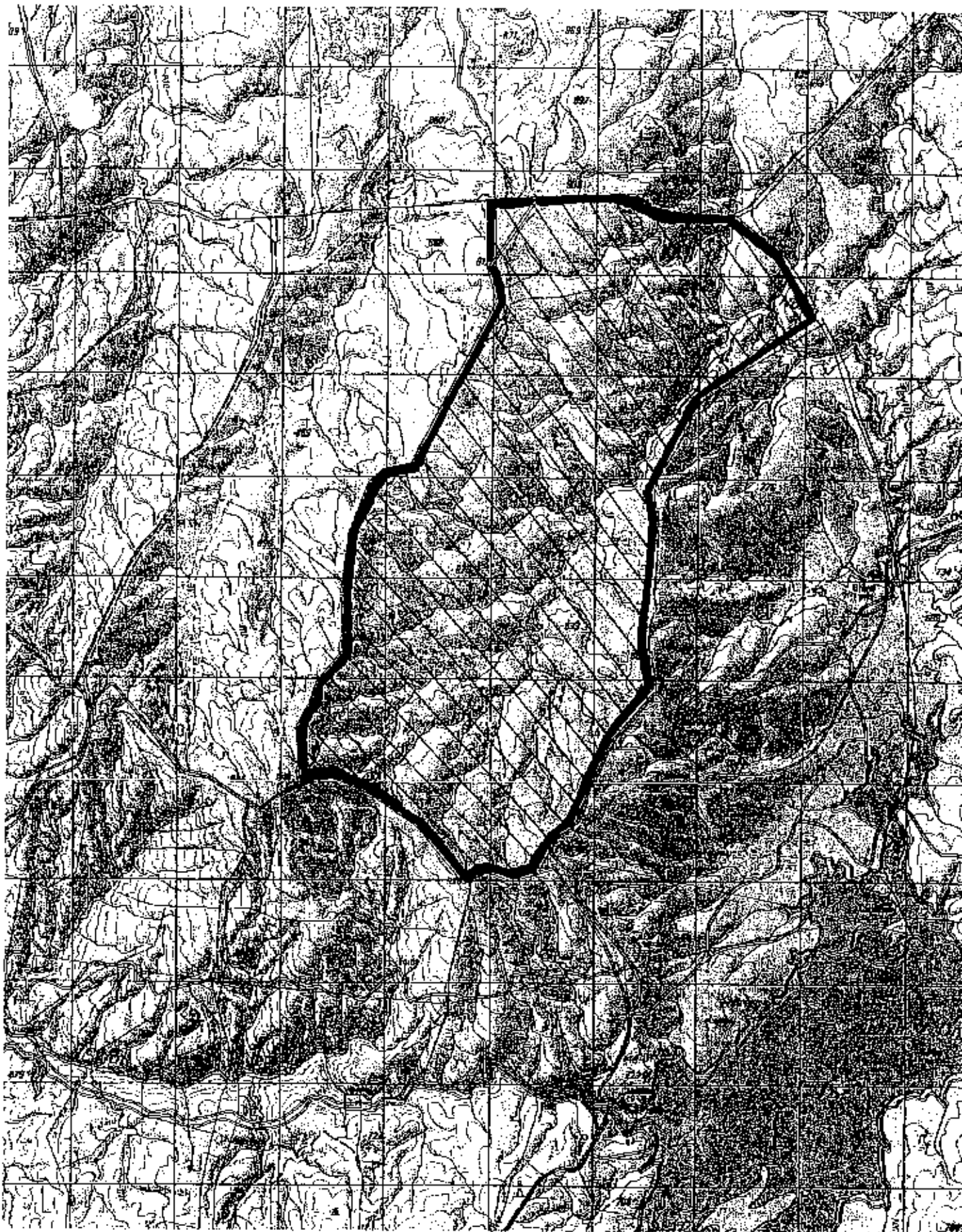


THE KNOBBIES PASTORAL LEASE MAP 5.2.2(b)(i)

THE KNOBBIES BLOCKS -- Landscape Values

-  Lease Boundary
-  Landscape Unit

Areas that make a significant contribution to the




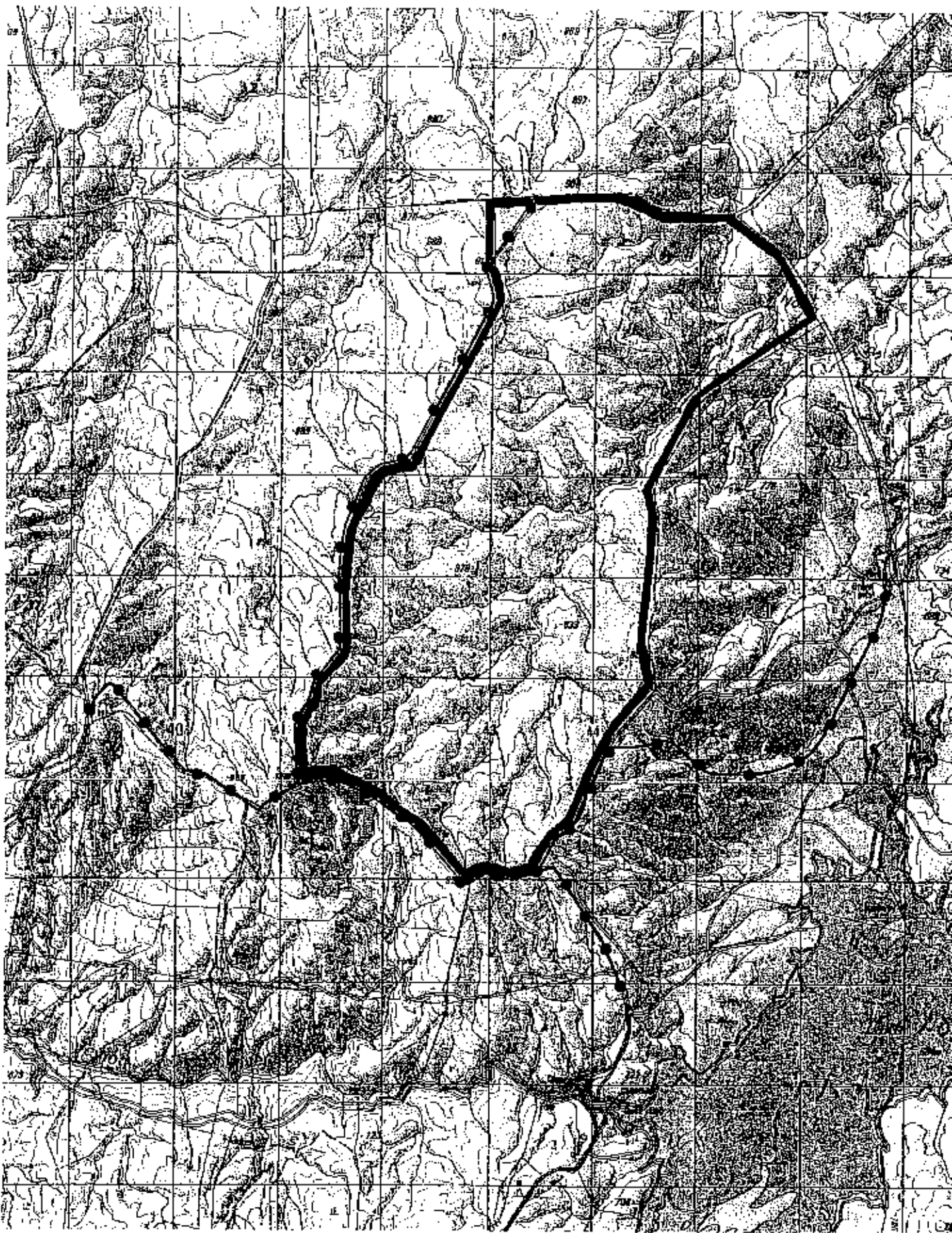
THE KNOBBIES PASTORAL LEASE

MAP 5.2.2(a)

THE ONSLOW BLOCK – Biological Values

 Lease Boundary

 Red Tussockland



THE KNOBBIES PASTORAL LEASE

MAP 5.2.1

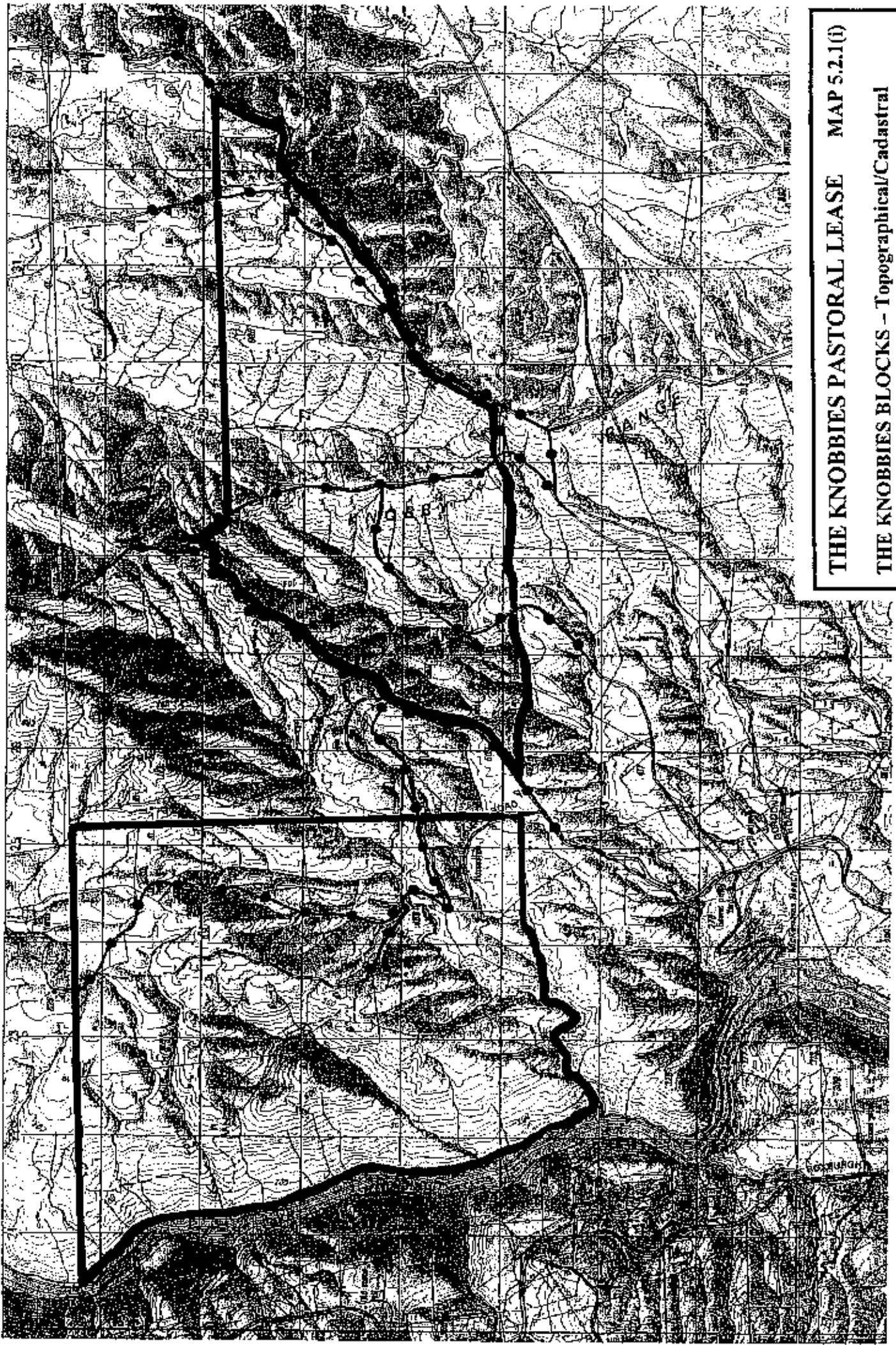
THE ONSLOW BLOCK – Topographical/Cadastral Info



Lease Boundary



Legal Road Line



THE KNOBBIES PASTORAL LEASE MAP 5.2.1(i)

THE KNOBBIES BLOCKS - Topographical/Cadastral

— Property Boundary

PROPOSED MANORBURN LANDSCAPE MANAGEMENT ZONE

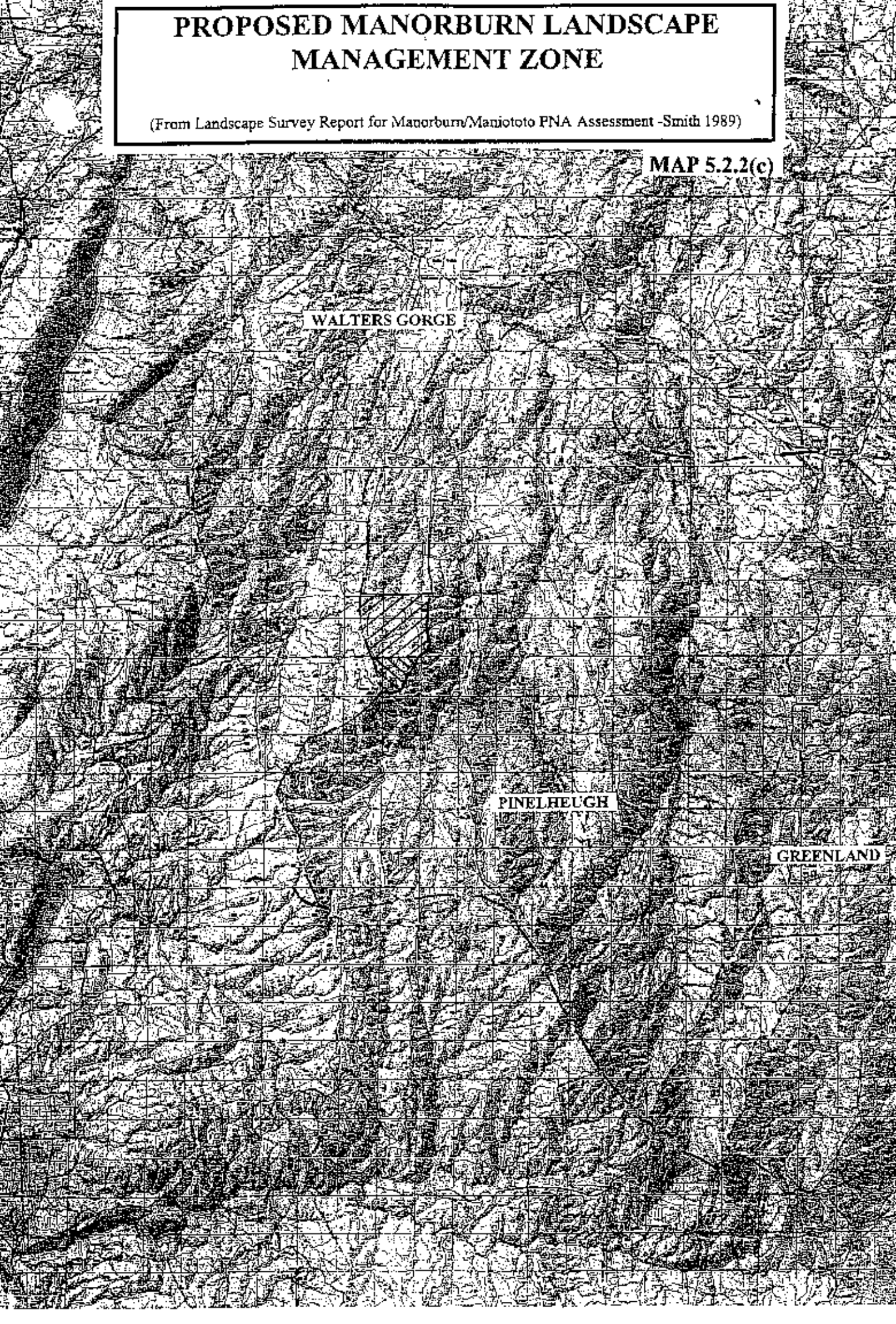
(From Landscape Survey Report for Manorburn/Maniototo PNA Assessment - Smith 1989)

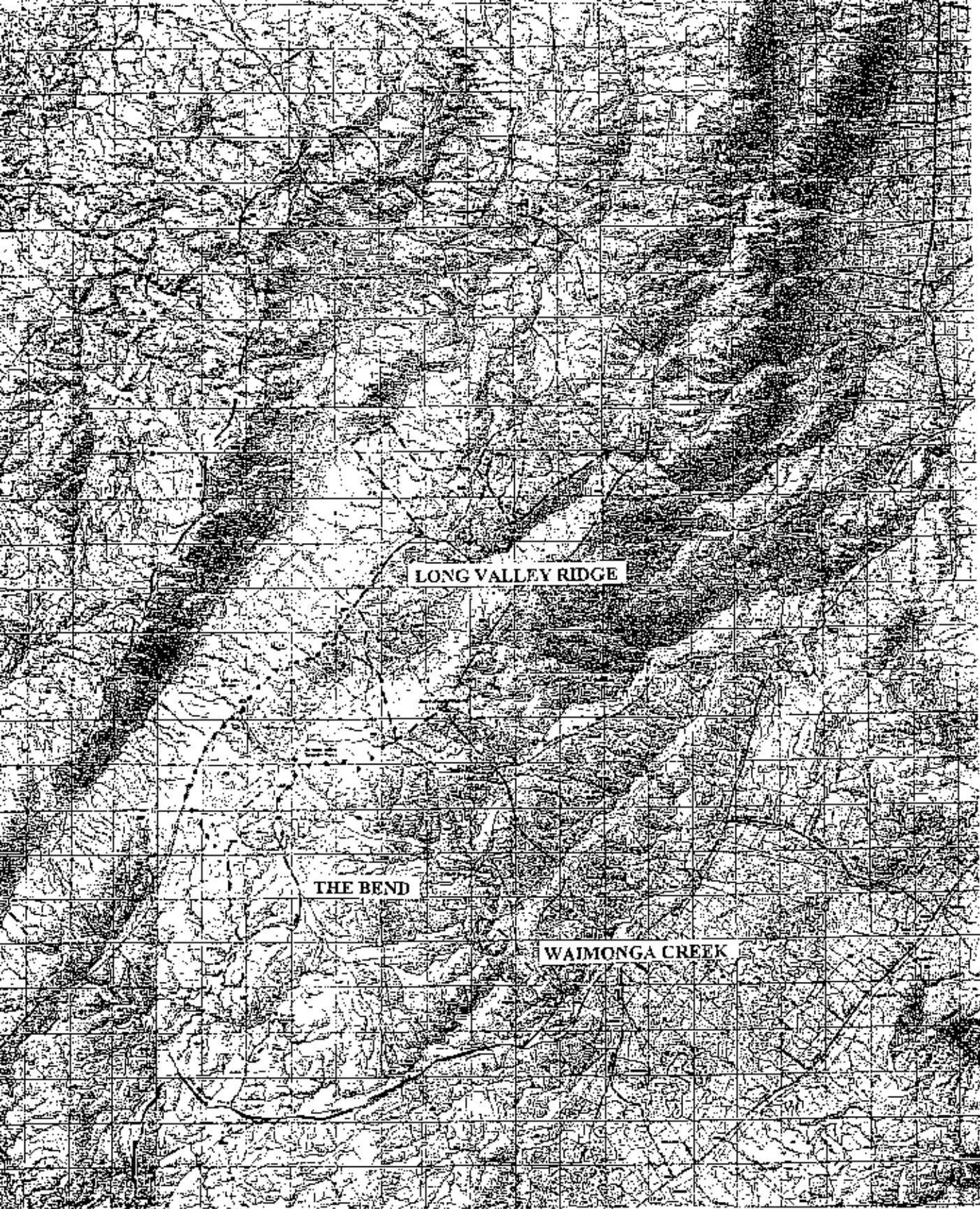
MAP 5.2.2(c)






WALTERS GORGE

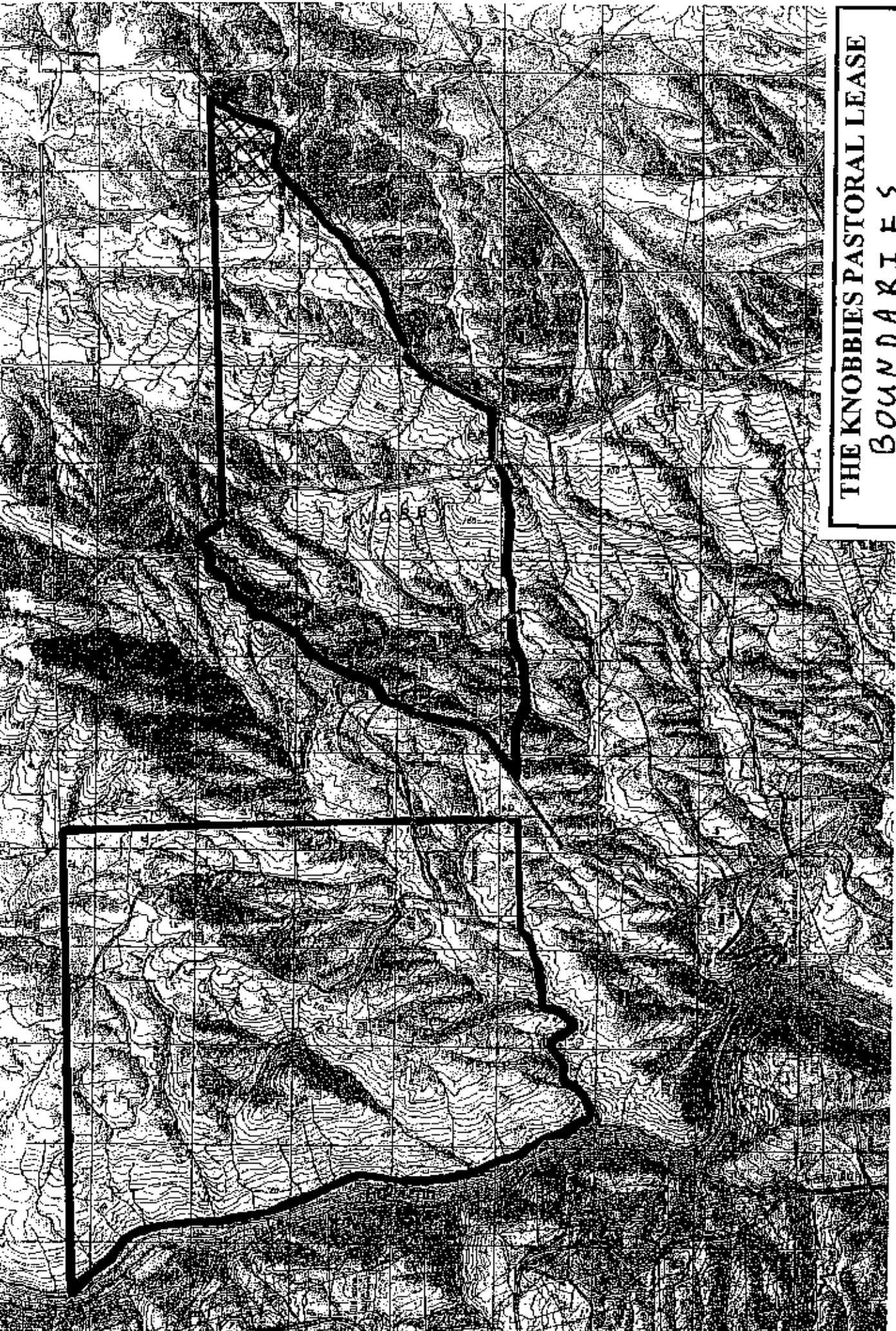
PINELHEUGH

GREENLAND





-  Proposed Manorburn Landscape Management Zone
-  Ecological RAP, Provisional Boundaries
-  Area extended on basis of Landscape Values
-  Part 'The Knobbies' Pastoral Lease
-  Part 'Cairnhill' Pastoral Lease



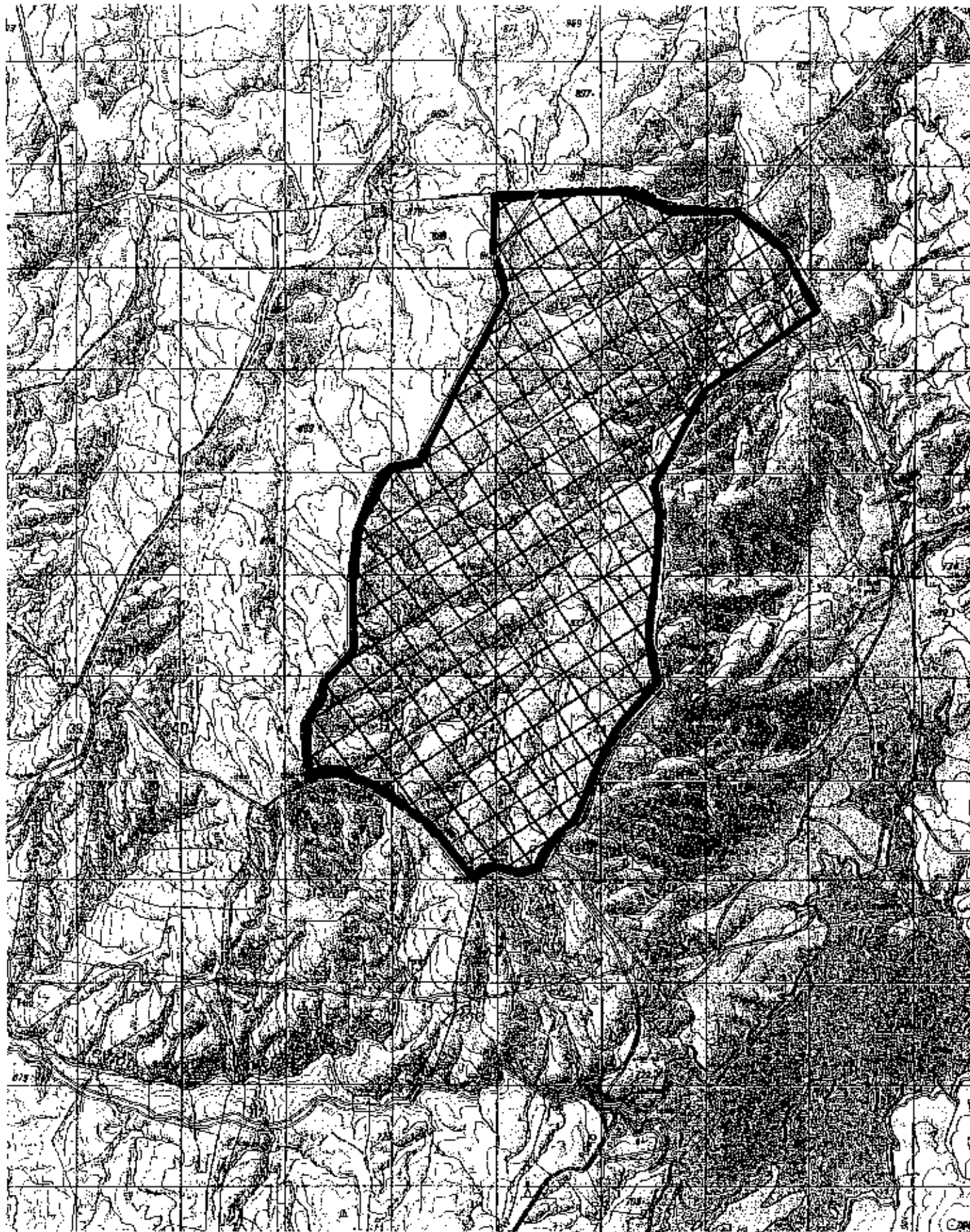
THE KNOBBIES PASTORAL LEASE

BOUNDARIES


THE KNOBBIES BLOCKS

MAP 5.2.3 (I)





**THE KNOBBIES PASTORAL LEASE
BOUNDARIES
THE ONSLOW BLOCK MAP 5.2.3 (i)**

 Conservation Land (Proposal 4.2.1.1)