Toitu te whenua
Land Information
New Zealand

Crown Pastoral Land Tenure Review

Lease name : AIRIES

Lease number : PT 090

Conservation Resources Report

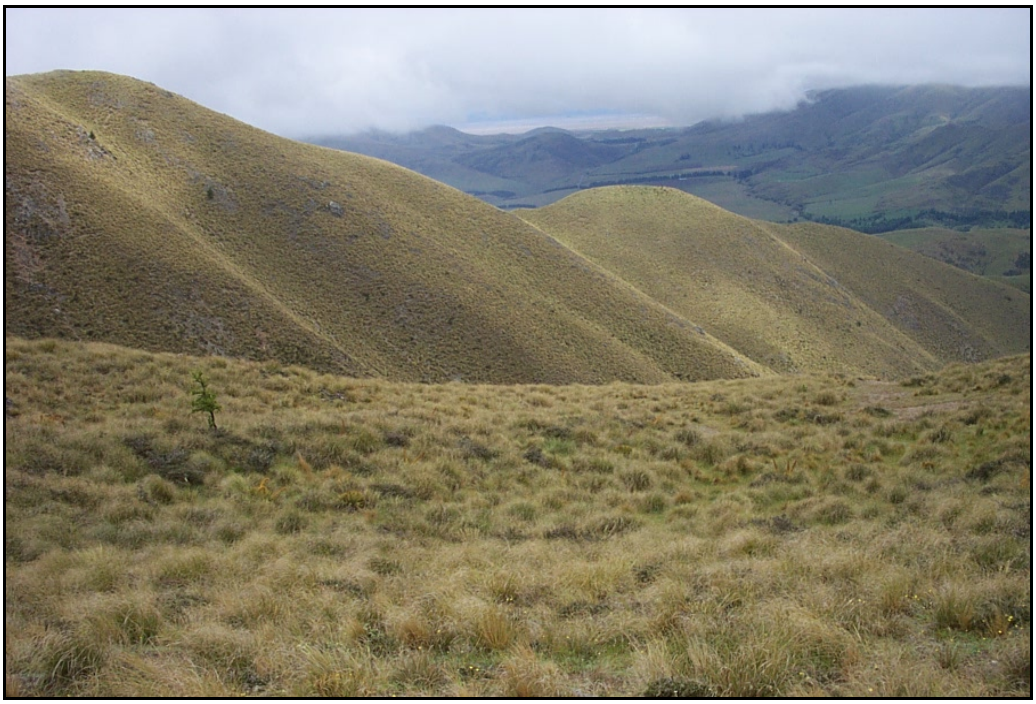
As part of the process of Tenure Review, advice on significant inherent values within the pastoral lease is provided by Department of Conservation officials in the form of a Conservation Resources Report. This report is the result of outdoor survey and inspection. It is a key piece of information for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

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

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

June 06

AIRIES PASTORAL LEASE



CONSERVATION RESOURCES REPORT

DEPARTMENT OF CONSERVATION

JUNE 2006

TABLE OF CONTENTS

PART 1 INTRODUCTION

Airies Pastoral Lease is a 1655 ha property located in the upper Opihi Valley near Burke Pass in South Canterbury. It covers moderately-steep west-facing slopes on the northwest end of the Albury Range, and lower-altitude hills of gentler relief between the Albury Range and the Opihi River. The property ranges in altitude from 500 m at the Opihi River near the homestead to 1130 m on the Albury Range. It is drained by the Opihi River and its tributaries in the north and west, and Duck Stream (a tributary of the Tengawai River) in the southeast (see attached map).

Access to the property is via the Fairlie Tekapo Road (State Highway 8) on the northwest boundary of the property and via unformed legal roads from Rollesby Valley Road on the southwest boundary of the property.

Airies Pastoral Lease lies in the Hunters Ecological District, within Pareora Ecological Region (McEwen, 1987). This ecological district has not been surveyed as part of the Protected Natural Areas Programme.

The property adjoins Three Springs Pastoral Lease to the east, a small Conservation Area across the Opihi River to the northwest (Conservation Land Unit I38002) and freehold land on all other boundaries. No parts of the lease are currently subject to protection for conservation purposes.

The tenure review inspection of the property was undertaken during September and December 2005 by a range of specialists. These specialists' reports (listed below) form the basis of this Conservation Resources Report.

- Airies Pastoral Lease Landscape Assessment, Alan Petrie, October 2005, 5p + photos + map.
- Plant Communities of Airies Pastoral Lease and Recommendations for Protection, Mike Harding, December 2005, 11p + photos + maps.
- Assessment of the Fauna Values (birds and lizards) of Airies Pastoral Lease, Simon Elkington, December 2005, 7p + maps.
- Airies Pastoral Lease, A Report on the Aquatic Fauna Surveys, Scott Bowie, February 2006, 16p + photos + maps.
- Airies Pastoral Lease Tenure Review Assessment of Entomological Values, Rowan Emberson and Pauline Syrett, January 2006, 10p + photos + maps.

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

2.1 LANDSCAPE

2.1.1 Landscape Context

Airies Pastoral Lease covers the northwest part of the Albury Range in South Canterbury. This low range, along with the nearby Rollesby and Dalgety ranges, forms the front ranges that separate the coastal downlands and plains from the intermontane Mackenzie Basin. A low-relief skyline with occasional high points and dissected ridges and spurs separating V-shaped gullies typifies the Albury Range. The two principal structural components of the property are a chain of angular hillocks that trend in a north-south direction and the west-facing slopes of the Albany Range.

2.1.2 Landscape Description

For the purposes of this landscape assessment Airies Pastoral Lease is divided into four landscape units, principally based on aspect and landform (see attached map). The criteria used to assess and evaluate the landscape values of each unit are based on the following attributes:

- Naturalness: an expression of the 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 processes are.
- Aesthetic value: the memorability and naturalness of the area, including factors which can make a landscape vivid, such as simplicity in landform, muted colours and fine-textured ground cover.
- Visual values: a sub-set of landscape values which relate to the visibility of a particular landscape or natural feature as seen from public vantage points.

Unit 1, Duck Stream

This small unit covers the east-facing slopes of the main ridge on the property, in Duck Stream valley. The ridge dips to the south where it folds into a small enclosed basin. The eastern boundary to the unit is the property boundary on an alluvial terrace beside Duck Stream. The upper catchment of Duck Stream is in Three Springs Pastoral Lease.

The dominant landforms within the unit are the constant moderately-steep slopes that are regularly indented by straight runnels. Narrow formations of exposed rock are a common feature. Owing to the instability of the local geology, both gully and sheet erosion are evident on the lower slopes. Duck Stream winds across a bed of stones and gravel.

The existing vegetation has been strongly influenced by aspect and past management, with the majority of the unit covered in a disjointed pattern of modified tussockland and matagouri/*Coprosma* shrubland. These grey shrublands tend to be denser at the base of the slopes and frequently extend up the damper gullies. Above approximately 850 m tall tussockland become the dominant ground cover. Mountain flax, wilding pines and wilding pine seedlings are present on the mid slopes.

Landscape Values
This unit conveys moderate inherent landscape values attributable to the fragmented nature of the original ground cover and the absence of any notable natural features or landforms. The tall tussocklands that clad the upper slopes have moderately high naturalness values.

Potential Vulnerability to Change
Land uses that have the potential to adversely affect this unit are:
- Further spread of wilding pines.
- The spread and dominance of mouse-ear hawkweed.

Unit 2, Albury Range

This unit incorporates all of the west-facing slopes of the main ridge that forms the northern end of the Albury Range. The eastern boundary to the unit (and the property) is the ridge with its series of high promontories, including a prominent high point at 1130 m. To the west a sequence of rounded spurs project out from the main ridge. The spurs descend steeply to a narrow valley that separates the main range from the hillocks to the west (Landscape Unit 3). Separating the spurs are deep gullies that are typically rounded in form, though periodically dissected into the mantle of colluvium. These gullies eventually drain to the Opihi River. The upper slopes are susceptible to wind erosion.

The vegetative pattern is influenced by both altitude and aspect, with the sunnier mid and lower slopes clad in modified grasslands that contain a high component of pasture grasses. On the corresponding darker slopes the ground cover includes matagouri/*Coprosma* shrubland, small patches of bracken and modified grassland. Between 850 and 900 m altitude the ground cover grades to tall tussockland supplemented by golden speargrass and fescue tussock. A major concern on the mid and upper slopes is the presence of both pine and larch trees and seedlings. These wildings pose a direct threat to the integrity of the tussocklands. Vehicle tracks are present on the main ridge and on the lower parts of the main spurs.

Landscape Values
The inherent landscape values within this unit have been assessed in two parts. The mid and lower slopes of the Albury Range possess moderate inherent landscape values due to the degree to which the original ground cover has been modified and the absence of any significant natural features or landforms. The upper slopes contain high inherent landscape values attributable to the visual coherence provided by the continuous tussock cover. The lack of any hard edges between the higher altitude tussockland and the more modified lower altitude grassland is a distinctive feature.

Potential Vulnerability to Change
Land uses that have the potential to adversely affect this unit are:
- Further spread of wilding trees across the mid and upper slopes.
- Spread of mouse-ear hawkweed.
- Further replacement of native tussockland with introduced woody plant communities.
- Fragmentation of the uniform tussockland by subdivision fencing.
- Further gully and wind erosion.

Unit 3, Central Hills

This unit comprises the chain of angular hillocks that run parallel with the Albury Range, to the west of Landscape Unit 2. The heights of the hillocks are relatively constant, varying between approximately 740 and 800 m. Each of the hillocks is similar in form, being generally pyramid-shaped and rising abruptly from the surrounding gentler country. Low concave saddles link the hillocks.

Much of the original ground cover has been converted to improved pasture, except for small thickets of matagouri/*Coprosma* shrubland on darker slopes and areas of low matagouri-prostrate kowhai scrub on dry rocky slopes.

Landscape Values
This unit possesses moderately high landscape values due to the distinctive form of the hillocks. This chain of regular-shaped landforms, adjacent to the surrounding rangelands, is a highly recognizable natural feature in the district.

Potential Vulnerability to Change
Land uses that have the potential to adversely affect this unit are:
- Tree planting or tree spread obscuring the distinctive form of the hillocks.

Unit 4, Western Hills

This unit covers the low north- south trending ridge at the northwest end of the property, adjacent to the Opihi River. The highest point of the ridge is 787 m, from where it gradually falls to the north near the homestead. The slopes descending from the ridgeline are moderately steep and indented by straight gullies, with patches of deep gully-erosion.

The ground cover is dictated by aspect, with the east-facing slopes and the ridgeline clad in introduced grasses with widely distributed matagouri/*Coprosma* shrubland. West-facing slopes overlooking the Opihi River are covered in an assortment of shrubland, grassland and various exotic trees including Douglas fir, larch and pine. Lining the Opihi River are plantings of poplar and willow.

Landscape Values
This unit conveys only moderate inherent landscape values owing to the disjointed nature of the ground cover and the absence of any highly recognizable natural features or landforms.

Potential Vulnerability to Change
Land uses that have the potential to adversely affect this unit are:
- Further spread of woody weeds and exotic trees.

2.1.3 Visual Values

Airies Pastoral Lease possesses high visual resource values attributable to the fact that a large proportion of the property can be viewed from State Highway 8 (Fairlie Tekapo Road). This highway is an integral part of the important tourist route between the Canterbury Plains and the Mackenzie Basin (and Aoraki/Mt Cook National Park and the southern lakes). For travellers crossing Burke Pass from the Mackenzie Basin to the Canterbury Plains, the property unravels in front of the viewer with the chain of pyramid-shaped hillocks (Landscape Unit 3) dominant in the middle ground and the west-facing slopes of the Albury Range (Landscape Unit 2) creating a visually pleasant backdrop. The contrast in colour between the green improved grasslands that clad the hillocks and the tawny colour of the tussockland that covers the ranges is a striking feature.

The enclosed character of the Opihi River valley with its restricted views differs greatly from the open and uncluttered panoramic views that are experienced across the outwash plains of the Mackenzie Basin. In many respects this property is part of a distinctive transition between the downs and intermontane basins of South Canterbury.

Significance of Landscape Values

The mid and upper west-facing slopes make a significant contribution to the landscape character of the Albury Range and the district in general. These values are attributable to the coherent qualities of the tall tussockland and the lack of hard edges between the tussockland and the modified lower country. The chain of low hillocks at the base of the Albury Range also contributes to the inherent landscape character of the area.

2.2 GEOLOGY, LANDFORMS AND SOILS

2.2.1 Geology

The basement rocks of the main part of Airies Pastoral Lease, on the northern end of the Albury Range, are moderately-indurated greywacke and argillite of the Torlesse Group. Rocks of the low ridge beside the Opihi River at the northwest corner of the property are weakly schistose non-foliated greywacke and argillite of the Haast Schist Group (Chlorite Subzone II). Hill slopes are mantled with deposits of loess (wind-deposited sediments) and valley floors have deposits of till and outwash gravels of the Burnham Formation (Gair, 1967). A prominent fault traverses the property along the central north- south trending valley.

2.2.2 Landforms

Two distinct landforms are present on Airies Pastoral Lease: the moderately-steep slopes of the Albury Range on the eastern side of the property and the gentler ridges, hillocks and valleys on the western side of the property. The slopes of the Albury Range comprise rounded spurs and shallow, though occasionally incised, gullies. The main ridge crest is relatively gentle, with low rounded summits. The lower hills are gentle and angular, with even slopes and occasional rock outcrops. They are a distinctive feature of the property, and are clearly visible from public vantage points. The effects of movement along the major fault that traverses the property are evident through the central valley which separates the lower hills from the higher and steeper Albury Range.

2.2.3 Soils

Higher altitude parts of the property on the Albury Range, and the ridge alongside the Opihi River in the northwest part of the property have Tengawai steepland soils and smaller areas of Kaikoura steepland soils. The low hills have Tengawai hill soils. Gentler slopes on the southwest edge of the property have Glenroy silt loams.

Significance of Geology, Landforms and Soils

The most significant features of Airies Pastoral Lease are the series of low hills along the central part of the property and the faulted north- to south trending valley alongside these hills. These features are characteristic of this part of the Canterbury high country, though are more visible to the public here than in most other places. There are no geopreservation sites listed for the property.

2.3 CLIMATE

Airies Pastoral Lease has a sub-humid hill country climate with cool to cold winters and mild dry summers. Predominant winds are from the northwest, with occasional gales. Cool southerlies are common in winter. Snow can affect all parts of the property and lie at higher altitudes for several weeks in winter. Average annual precipitation is approximately 800 mm (Tomlinson, 1976). The climate of the area is strongly influenced by the sheltering effects of the Southern Alps, resulting in drier conditions than occur in most of New Zealand's other mountain environments (Leathwick *et al*, 2003).

2.4 LAND ENVIRONMENTS OF NEW ZEALAND (LENZ)

Leathwick *et al* (2003) propose that higher altitude parts of the property (covering c.88% of the property) lie within Level IV land environments P1.2d, Q1.1d, Q2.1a and Q3.1b. Gentler lower altitude valleys and slopes (c.12%) lie within land environments E3.1a, N2.1d and N3.1a.

Land Environments P1.2d, Q1.1d, Q2.1a and Q3.1b (higher-altitude areas) are described by Leathwick *et al* (2003) as originally supporting mixed podocarp-hardwood forest (matai, totara and kahikatea over a hardwood canopy) at lower-altitudes and mountain totara-mountain toatoa low-forest and scrub at higher altitudes. Land Environments E3.1a, N2.1d and N3.1a (lower altitude valleys and slopes) are described as originally supporting podocarp-hardwood forest with minor areas of scrub or tussockland on rocky or recently-deposited substrates. However, these data should be interpreted with caution, as the predicted extent and suggested vegetation types for each Land Environment (Leathwick *et al*, 2003) have been extrapolated from limited field data.

The approximate extents to which the Level IV land environments of the property are legally protected are: E3.1a, 3%; N2.1d, 1%; N3.1a, 1%; P1.2d, 49%; Q1.1d, 35%; Q2.1a, 9%; and Q3.1b, 27% (Department of Conservation, *unpublished data*, January 2006). Gentle low-altitude sites at the western edge of the property (N2.1d and N3.1a) are "acutely-threatened". Gentle valley floors on the property (E3.1a) are "chronically threatened". Most other parts of the property (Q2.1a) are "critically under-protected". Acutely-threatened land environments are those in which less than 10% of the original indigenous vegetation remains. Chronically-threatened land environments are those in which between 10% and 20% of the original indigenous vegetation remains. Critically under-protected land environments are those in which more than 30% of the original indigenous vegetation remains and less than 10% is legally protected.

Significance of Land Environments

Gentler lower-altitude parts of Airies Pastoral Lease (12% of the property) are classified as "much reduced" (acutely- or chronically-threatened) land environments. Three of these land environments (E3.1a, N2.1d and N3.1a) have 3% or less of their total area legally protected. Most of the remaining parts of the property (80%) are classified as a "critically under-protected" land environment (Q2.1a), with only 9% of its total area legally protected.

2.5 VEGETATION

2.5.1 Ecological Context

Airies Pastoral Lease lies in the Hunters Ecological District, within Pareora Ecological Region (McEwen, 1987). This ecological district has not been surveyed as part of the Protected Natural Areas Programme. The original (pre-human) vegetation of Hunters Ecological District was probably podocarp and podocarp-hardwood forest at lower altitudes, podocarp-hardwood low-forest at mid altitudes and scrub and tall tussock at higher altitudes (McEwen, 1987; Andersen, 1916). The extent to which the area has been affected by natural fires is unclear but it is likely that such fires had an influence, particularly on drier slopes.

2.5.2 Vegetation and Flora

The original indigenous plant communities of Airies Pastoral Lease are substantially depleted. Almost all lower altitude parts of the property are modified and now support plant communities dominated by pasture species or low-stature matagouri shrubland. Only very small areas of indigenous vegetation are present at low altitudes, notably prostate kowhai shrubland on rocky knolls. Tall tussockland is present at higher altitudes on the west-facing slopes of the Albury Range, with areas of rockland and scree in the upper gully-heads. The condition and naturalness of the tussockland generally increases with altitude, though there are some higher-altitude sites where pasture species are dominant. These indigenous plant communities are described below for the two distinct parts of Airies Pastoral Lease.

Lower-altitude hills and valleys

This area covers the lower-altitude hills and valleys on the property, comprising all areas below approximately 800 m. This part of the property is dominated by the low ridge along the Opihi River south of the homestead, the series of low hills east and south of that ridge (spot heights 802, 788, 741, 805 and 785) and the valleys either side of these low hills. Hill slopes and valleys within this area have gentle relief and only minor occurrences of exposed rock.

Vegetation over this part of the property is predominantly cultivated or over-sown pasture with widespread low-stature matagouri shrubland. The extent and vigour of the matagouri shrubland probably results from the aerial application of fertiliser. Large areas of this shrubland appear to have been treated with herbicide. Other species commonly present within this pasture-shrubland community are porcupine shrub, scrub pohuehue, silver tussock, elderberry, foxglove, thistles and self-sown (wilding) larch and pine trees. Occasionally present are pohuehue, *Calystegia tugurorium*, *Coprosma propinqua*, native broom, sweet brier, bracken, gooseberry, St John's wort and cabbage tree. Porcupine shrub, woolly mullein, nettle, mouse-ear hawkweed and stonecrop are common at drier sites such as rocky spurs. Also present at dry sites are scabweed, fescue tussock, blue tussock, patotara, golden speargrass, creeping pohuehue, *Asplenium appendiculatum*, *Geranium sessiliflorum*, *Scleranthus uniflorus* and horehound.

The west-facing slopes above the Opihi River are steeper and stonier than most other low-altitude parts of the property. Additional species present at rocky sites on the upper slopes are isolated bushes of prostrate kowhai, *Coprosma crassifolia* and scattered native broom plants. Wilding larch and pine trees and infestations of broom and gorse are present, and in places common, on the lower slopes. Crack willow trees are present along the Opihi River. Three moderate-sized kowhai trees and a single *Olearia virgata* shrub were observed at the northern end of these slopes. Overall these slopes are highly modified and the remnant indigenous species are threatened by the spread of woody weeds.

The north- and west-facing slopes of the small hills at the southern end of the property (including spot heights 805 and 785) are less modified than those on other parts of the property. These dry stony faces support extensive patches of prostrate kowhai shrubland, with more than 100 individual shrubs of prostrate kowhai at each of at least four locations. Species commonly present in these shrublands are porcupine shrub, matagouri, creeping pohuehue, *Coprosma propinqua*, blue tussock, mouse-ear hawkweed, horehound and at some locations *Coprosma crassifolia* and *Einadia allani*. Other species present are native broom, silver tussock, scabweed, *Geranium sessiliflorum*, *Acaena caesiiglauca*, harebell, creeping pohuehue, *Senecio dunedinensis*, necklace fern, suckling clover, sweet vernal, woolly mullein, nettle, stonecrop and sheep's sorrel. Occasionally present are *Olearia virgata*, elderberry, *Crassula sieberiana* and *Oxalis exilis*. Dense to scattered narrow-leaved snow tussock and matagouri are occasionally present on some south-facing slopes. Otherwise the south- and east-facing slopes of these low hills are dominated by pasture with scattered matagouri.

At the southeast end of the property in the Duck Stream valley, the shrublands support occasional *Olearia virgata*, including one large old specimen in the lower valley with several trunks measuring 15-20 cm in diameter. *Olearia bullata* shrubs and hybrid *O. virgata* x *O. bullata* shrubs are also present in the Duck Stream shrublands. Other species occasionally present are lawyer, prickly shield fern, hemlock and mountain flax.

Seepages are occasionally present on valley floors. Plant communities at these sites are dominated by *Carex coriacea* and pasture grasses. The most extensive of these is in the valley west of spot height 788. *Carex coriacea* is dominant over most of this area, though pukio, *Carex petriei* and rushes (*Juncus* spp.) are also occasionally present. There are only very small areas that are perpetually wet and these are dominated by introduced species such as monkey musk.

Minor areas of open riverbed are present. All except the Duck Stream riverbed are highly modified. Dominant species on the Duck Stream riverbed are creeping pohuehue and stonecrop. Also present are *Raoulia tenuicaulis*, *Parahebe decora*, silver tussock, tutu, feathery tutu, *Acaena inermis*, *Epilobium melanocaulon*, mouse-ear hawkweed, sheep's sorrel, woolly mullein, monkey musk, mouse-ear chickweed, suckling clover, white clover and Yorkshire fog.

Higher-altitude slopes (Albury Range)

This area covers the parts of the property above approximately 800 m altitude, on the northwest end of the Albury Range. It is characterised by moderately steep slopes with steeper slopes in the gully heads and gentler relief on the broad ridge crest at the eastern property boundary. Vegetation over this part of the property is predominantly narrow-leaved snow tussock. Tussock cover ranges from dense on upper slopes to sparse on mid-altitude slopes and on the ridge crest. The density and extent of tussock cover appears to have been influenced by over-sowing and top-dressing, grazing pressure and fire. Wilding larch and pine trees are present and in places common, especially on steeper slopes below the central part of the ridge.

At mid altitudes (800 to 900 m) the tussocklands are dominated by narrow-leaved snow tussock, with a canopy cover between 20 and 30%. Other dominant species are matagouri, golden speargrass, snowberry, blue tussock, sweet vernal, browntop and mouse-ear hawkweed. Also common are fescue tussock, *Coprosma petriei*, *Anisotome aromatica*, white clover, suckling clover, Yorkshire fog, lichen and mosses. Other species present are native broom, coral broom, patotara, *Geranium microphyllum*, *G. sessiliflorum*, harebell, *Pimelea pseudolyallii*, *Brachyglottis lagopus*, feathery tutu, red woodrush, *Blechnum penna-marina*, *Lycopodium fastigiatum*, *Polytrichum juniperinum*, *Celmisia gracilenta*, *Aceana caesiiglauca*, *Carex* sp., catsear, sheep's sorrel and mouse-ear chickweed.

At higher altitudes (900 to 1100 m), narrow-leaved snow tussock forms a denser cover (up to 50%) and introduced pasture species are less dominant. Other species commonly present are golden speargrass, blue tussock, fescue tussock, *Raoulia subsericea*, snowberry, *Anisotome aromatica*,