Toitu te Land whenua Information New Zealand

Crown Pastoral Land Tenure Review

Lease name : AIRIES

Lease number : PT 090

Conservation Resources Report

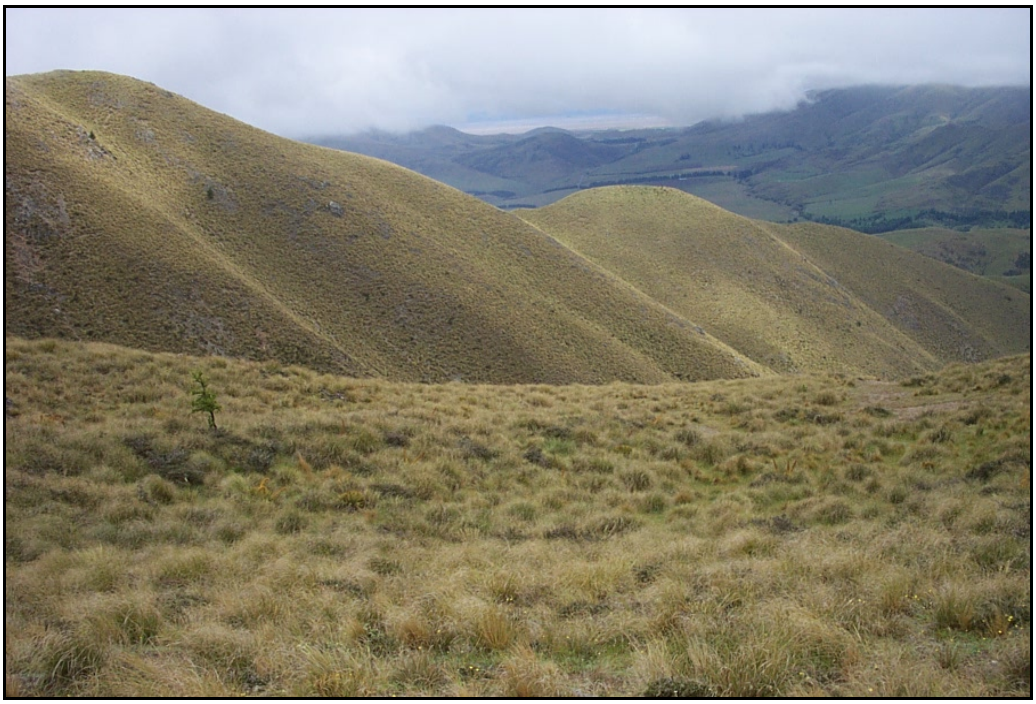
As part of the process of Tenure Review, advice on significant inherent values within the pastoral lease is provided by Department of Conservation officials in the form of a Conservation Resources Report. This report is the result of outdoor survey and inspection. It is a key piece of information for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

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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*,

Coprosma petriei, mouse-ear hawkweed, catsear, sweet vernal, lichens and mosses. Other species present are matagouri, coral broom, *Helichrysum bellidioides*, *Celmisia gracilenta*, red woodrush, patotara, *Leucopogon suaveolens*, *Pimelea oreophila*, *P. traversii*, *Ranunculus multiscapus*, *Anisotome filifolia*, *Scleranthus uniflorus*, *Pentachondra pumila*, *Brachyglottis lagopus*, native violet, *Myrsine nummularia*, *Gonocarpus montanus*, *Kelleria dieffenbachii*, *Leptinella serrulata*, *Blechnum penna-marina*, *Polytrichum juniperinum*, woolly moss, browntop and sheep's sorrel.

Steep eroding slopes at the heads of the main gullies have areas of fine hard scree and broken rock. These areas are sparsely vegetated. Important species present are *Raoulia glabra*, *Epilobium pycnostachyum* and sheep's sorrel. Other species present are bristle tussock, narrow-leaved snow tussock, golden speargrass, *Colobanthus acicularis*, scabweed, *Geranium sessiliflorum*, *Anisotome filifolia*, *Senecio glaucophyllus*, harebell, *Acaena caesiiglauca*, *Ranunculus crithmifolius*, *Myosotis australis*, native dandelion, native violet, *Cardamine bilobata*, creeping pohuehue, *Coprosma acerosa*, mouse-ear hawkweed, king devil hawkweed and sweet vernal. Scattered *Coprosma propinqua* scrub and occasional patches of mountain ribbonwood are present at the margins of these eroding slopes and along the stream sides in the gullies below.

Notable Species Recorded

Seven notable plant species were recorded. Threat categories are from de Lange *et al* (2004).

Table 1 Notable plant species, Airies Pastoral Lease, December 2005.

Plant Species	Threat Status	Distribution on Property
Carmichaelia crassicaule (coral broom)	Gradual decline.	Common and in places abundant, especially at higher altitudes.
Coprosma acerosa	Not threatened; locally uncommon.	Present on steep eroding slopes at the gully heads.
Einadia allani	Not threatened; locally uncommon.	Common in the prostrate kowhai shrublands at the southwest corner of the property.
Leptinella serrulata	Gradual decline.	At one location on the crest of a side spur of the main ridge.
Pimelea pseudolyallii	Sparse.	Scattered throughout mid-altitude tussocklands.
Senecio dunedinensis	Sparse.	Present in the prostrate kowhai shrublands at the southwest corner of the property.
Sophora prostrata (prostrate kowhai)	Not threatened; locally uncommon.	At least four dense populations of over 100 individuals on low hills at the southwest corner of the property; isolated plants elsewhere on the property.

Significance of Vegetation and Flora

Indigenous plant communities on higher-altitude parts of Airies Pastoral Lease (generally above 900 m) on the west-facing slopes of the Albury Range at the eastern boundary of the property, have significant inherent values. These areas of tussockland and scree are representative, or have components that are representative, of the original vegetation, have high naturalness values and support populations of threatened plant species (coral broom, *Pimelea pseudolyallii* and *Leptinella serrulata*). Small hills at lower-altitudes at the southwest corner of the property also have significant inherent values. The north- and west-facing slopes of these hills support shrubland communities that are representative of the original vegetation, are dominated by the locally-uncommon prostrate kowhai, and contain the threatened herb *Senecio dunedinensis* and other uncommon species typical of such dryland vegetation including *Coprosma crassifolia* and *Einadia allani*. The prostrate kowhai shrublands in this area comprise the most extensive known populations in South Canterbury.

2.5.3 Problem Plants

Introduced plants and animals that may have an important effect on indigenous plant communities on the property, and that can be controlled or contained, are listed and discussed below. Other ubiquitous naturalised species for which containment or control are probably impractical, such as mouse-ear hawkweed and pasture grasses, are not discussed here but are listed in the vegetation descriptions.

Gorse
Infestations of gorse are present on the slopes above the Opihi River at the western edge of the property and at scattered locations elsewhere. An infestation of gorse on the northwest slopes of spot height 805 poses a threat to the prostrate kowhai shrublands at the southwest corner of the property. Other small infestations pose a potential threat to higher-altitude tussocklands. Removal of isolated infestations of gorse and containment of larger infestations will be necessary to protect conservation values.

Broom
A substantial infestation of broom is present on the slopes above the Opihi River at the western edge of the property. Scattered small infestations of broom are present elsewhere on the property, notably in Duck Stream and at one location on the ridge crest at the eastern boundary of the property. Removal of isolated infestations of broom and containment of larger infestations will be necessary to protect conservation values.

Elderberry
Elderberry trees are present throughout lower-altitude parts of the property, usually as isolated trees, including on the small hills at the southwest corner of the property. Elderberry fruits are readily dispersed by birds. Ideally all elderberry trees should be removed.

Sycamore, rowan, grey poplar, burdock and *Cotoneaster glaucophyllus*
These species were observed in the gullies northwest of spot height 1068 on the main ridge in the northern part of the property (Scott Bowie, *pers.comm.*). These species pose a significant threat to natural values and should be removed.

Stonecrop
This succulent herb is present throughout low-altitude parts of the property at dry stony sites. It appears well established and would be very difficult to eradicate.

Other weeds
Foxglove, horehound, nettle, woolly mullein, hemlock, St John's wort, sweet brier, gooseberry and several species of thistle are present on the property, mostly at lower altitudes.

Wilding larches and pines
Substantial infestations of wilding trees (predominantly larch) are present on the property, both on the higher slopes of the Albury Range and on the faces above the Opihi River. The total area affected is approximately 600 hectares, with about 450 hectares of this being on the Albury Range portion of the property. Wilding tree densities range up to about 100 stems per hectare on the higher country, and up to 200 stems per hectare on the Opihi River faces. Significant seed sources for wilding tree spread exist north and west of the property which means that long-term wilding tree control would be difficult and costly. Some wilding tree control has already been undertaken on the property.

2.6 FAUNA

2.6.1 Bats

Bats have not been recorded from this area. Airies Pastoral Lease was not checked for the presence of bats during this survey because bats are generally associated with forest, and there are no large stands of indigenous forest on the property.

2.6.2 Birds

The absence of forest on Airies Pastoral Lease and surrounding properties means there are few forest birds present in the area. South Island fantail, silvereye and grey warbler are present in shrubland and scrub. Australasian harrier, New Zealand pipit and New Zealand falcon (threat status: gradual decline) have been recorded in open and upland habitats. The braided Opihi River, on the boundary of the property, is severely degraded by the encroachment of woody weeds but in its upper reaches, still provides a small amount of habitat for banded dotterel (gradual decline), Australasian pied stilt, South Island pied oystercatcher, black fronted tern (nationally endangered), black-billed gull (serious decline) and black stilt (nationally critical).

During this survey, New Zealand falcon were observed throughout the property, in high altitude tussockland, montane and low-altitude shrubland and over developed pasture. New Zealand falcon hunt mainly for small passerine birds, which are abundant throughout the property. Tors and bluffs on the property would be suitable nesting habitat for New Zealand falcon. A pair of New Zealand falcon were observed at the south end of the property. Black shag (sparse) was recorded from Duck Stream.

Species Recorded

Twenty-seven bird species were recorded from Airies Pastoral lease during this inspection: 13 indigenous species (Table 2) and fourteen naturalised species. Two threatened bird species occur on the property: New Zealand falcon (gradual decline) and black shag (sparse).

Table 2 Indigenous bird species recorded from Airies Pastoral Lease, December 2005.

Bird species	Threat status	Distribution on property
Australasian harrier	Not threatened.	Throughout.
black shag	Sparse.	Duck Stream.
grey warbler	Not threatened.	Shrubland throughout.
New Zealand falcon	Gradual decline.	Throughout.
New Zealand pipit	Not threatened.	Throughout.
paradise shelduck	Not threatened.	Duck Stream; pasture, throughout.
silvereye	Not threatened.	Shrubland throughout.
southern black backed gull	Not threatened.	Throughout.
South Island fantail	Not threatened.	Shrubland throughout.
South Island pied oystercatcher	Not threatened.	Duck Stream.
spur-wing plover	Not threatened.	Low-altitude pasture.
welcome swallow	Not threatened.	Duck Stream; pasture, throughout.
white-faced heron	Not threatened.	Duck Stream.

Naturalised bird species observed on the property were Australian magpie, blackbird, California quail, chaffinch, chukor, dunnock, goldfinch, greenfinch, house sparrow, redpoll, skylark, song thrush, starling and yellowhammer.

Significance of the Bird Fauna

The whole property provides feeding habitat for New Zealand falcon (gradual decline), and parts of the property may provide breeding habitat for this species. Duck Stream, at the southeast corner of the property, provides feeding habitat for black shag (sparse).

2.6.3 Lizards

McCann's skink, common skink and Southern Alps gecko are widespread and abundant throughout the Mackenzie Basin and Waitaki regions. Scree skink (threat status: gradual decline), long-toed skink (sparse) and spotted skink (gradual decline) have been sporadically recorded from the region, with the nearest known populations recorded from the Two Thumb Range. Green skink (gradual decline) and jewelled gecko (gradual decline) have also been sporadically recorded from the region, with the nearest known populations recorded from the upper Tekapo River (Department of Conservation Herpetofauna Database).

Species Recorded

Two lizard species were recorded on Airies Pastoral Lease during this inspection: McCann's skink and Southern Alps gecko. Both species are common on the property, in two main habitat types: degraded tussockland with rock outcrops and scree, and matagouri-dominated shrubland with rock outcrops and talus. These habitats are also likely to support common skink. Southern Alps geckos were abundant in matagouri-prostrate kowhai scrub on a low hillock at the southern end of the property.

Significance of the Lizard Fauna

A population of Southern Alps gecko, with a very high density of individuals, is present on the low hillock at the southern end of the property.

2.6.4 Freshwater Fauna (fish and invertebrates)

Airies Pastoral Lease lies in the headwaters of the Opihi River. The main stem of the Opihi River forms the western boundary of the property and drains all the property except the southeast corner, which is drained by Duck Stream. Duck Stream flows into the Tengawai River, which flows into the lower Opihi River. A distinguishing feature of the Opihi River is the lack of dams. This has two main effects on fish communities. The first is that the fish communities are more likely to have diadromous species present (species with a sea phase in their lifecycle). The second effect is that fish are able to migrate between streams, allowing colonisation of previously dewatered streams.

The New Zealand Freshwater Fish Database (NZFFD) has 94 records (at 16th February 2006) from the Opihi River catchment. Species recorded from streams near the property are longfin eel, koaro, alpine galaxias, Canterbury galaxias, upland bully, common bully and brook char. Longfin eel has a threat status of gradual decline (Hitchmough and Bull, *in press*; Hitchmough, 2002).

Airies Pastoral Lease comprises two main geographical areas of freshwater habitat, one incorporating Duck Stream and its tributaries in the southeast part of the property, and the other covering the main northern and western parts of the property which drain directly into the Opihi

River. Four freshwater habitats, classified by size and physical character, were observed on or adjacent to the property. These habitats and the fish and invertebrate species recorded are described below.

Rivers

The Opihi River flows along the northwest boundary of the property. River bank vegetation is pasture, willow trees, gorse, broom, pine trees, matagouri and occasionally rushes and sedges. Access to the river bed by stock and wild animals is unrestricted. A vehicle track crosses the Opihi River near the homestead and there are other vehicle access points. The river is approximately 10 metres wide and more than 200 mm deep with occasional holes up to 700 mm deep. The river substrate is generally boulders, cobbles and gravels, with sand in some areas.

Two sites of river habitat were electro-fished: near the vehicle ford and near the confluence of Paddys Market Stream. Longfin eel, Canterbury galaxias and upland bully were found at both sites, and brown trout found at the vehicle ford. Alpine galaxias have been previously recorded (NZFFD) from this part of the Opihi River.

Macro-invertebrates observed in the river were *Olinga feredayi*, *Pycnocentria* sp., *Deleatidium* spp., *Stenoperla prasina* and *Beraeoptera roria*.

Permanent Streams

Permanent streams have year-round surface water flows and are confined to a single, sometimes gorged, channel. Streams or sections of streams of this habitat type on the property are Duck Stream and several other tributaries of the Opihi River. They flow through grassland, shrubland, willows and grey poplar. Monkey musk is present in the stream channels. Stock and wild animal access is unrestricted. These permanent streams are between half a metre and three metres wide and 100 to 600 mm deep with some deeper pools. Stream substrates are predominantly gravels and cobbles, with areas of bedrock and boulders in some streams and mud and silt in others.

Ten permanent-stream sites were electro-fished, two in the Duck Stream area and eight in the Opihi River area. Canterbury galaxias and upland bully were found at the two Duck Stream sites. Koaro and common bully have been recorded in Duck Stream downstream from the property (NZFFD). Upland bullies were present at six sites in the Opihi River area, all below the gorgy upper sections of the streams. Canterbury galaxias were found at three sites in this area. Brook char have been recorded in Paddys Market Stream (NZFFD).

Macro-invertebrates observed in the permanent streams were *Archichauliodes diversus*, *Aoteapsyche* sp., *Deleatidium* spp., *Megaleptoperla* sp., *Stenoperla prasina*, *Zelandoperla* sp., *Hydrobiosis* sp, *Olinga feredayi*, *Pycnocentria* sp., *Helicopsyche albescens* and *Hydropsychidae* sp.

Ephemeral Streams

These are streams that do not have year-round surface flows. On the property, these streams generally have wide overgrown gravel beds or occasionally smaller flood channels. Ephemeral streams are present throughout the property, ranging from streams with large stretches of gentle gradient and sub-surface flows to streams with steep gradients that only flow after rain. Stream-side vegetation is predominantly tussockland or grassland. Stock and wild animal access is largely unrestricted. Ephemeral streams are generally one to two metres wide, sometimes wider, and less than 100 mm deep, though all were dry at the time of survey. Most stream substrates are gravel with a few boulders and cobbles; others have silty substrates.

No ephemeral streams were surveyed for fish or macro-invertebrates, as there were no surface flows in the streams at the time of the inspection.

Wetlands

One riverine swamp was observed, near the middle of the property in the valley between points 788 m and 787 m. This riverine swamp is dominated by sedgeland, rushland, introduced grasses and monkey musk. Stock and wild animal access is largely unrestricted. A vehicle track runs beside the wetland, but does not cross it. The wetland is about two hectares in size, with a mud and gravel substrate.

The wetland was not surveyed directly for fish, but upland bully and Canterbury galaxias were recorded in the adjacent stream.

Species Recorded

Four fish species were recorded during this survey of Airies Pastoral Lease (Table 3).

Table 3 Fish species recorded on or adjacent to Airies Pastoral Lease, December 2005.

Fish species	Threat status	Distribution on property
brown trout	Introduced.	Opihi River.
Canterbury galaxias	Not threatened.	Permanent waterways, throughout.
longfin eel	Gradual decline.	Opihi River.
upland bully	Not threatened.	Permanent waterways, throughout.

Significance of the Freshwater Fauna

One threatened species, longfin eel (gradual decline) was recorded in the Opihi River, on the property boundary. Longfin eel may also utilise other freshwater habitats on the property. Three native fish species were recorded at two sites in the Opihi River and are likely to be present in the river along the length of the property boundary. The bulk of the Opihi River is recognised as a 'Type II' in the Waters of National Importance (WONI) documentation (Chadderton *et al*, DOC 2004). 'Type II' implies that the waterway contains special features of national significance. Only sections of 'Type II' catchments are of national importance. This significance is for its nationally significant braided river birds.

2.6.5 Invertebrates

Because of the limited time available for the survey, collecting was concentrated on beetles (Coleoptera). This order comprises the largest and most diverse group of insects in New Zealand. Beetles occur in all terrestrial and freshwater habitats and have the widest range of feeding habits of any group of terrestrial invertebrates. They are relatively well known in New Zealand compared with some other groups, and have been used extensively in ecological surveys (e.g. Harris and Burns, 2000). Invertebrates of Airies Pastoral Lease are described below for the main parts of the property surveyed.

Tributaries of the Opihi River

This area encompasses a low range of hills rising above the Opihi River, some lower valley floors and part of the western side of the Albury Range. The valley bottoms and lower slopes have generally been developed into exotic pasture while the upper slopes retain large areas of modified tussockland. Small areas of native shrubland survive in the gullies on the Albury Range. Collecting indicated that across most of this area the native insect fauna lacked diversity. However, the tops of the Albury Range (above c.1000 m) retain more native vegetation and a number of beetle species were collected here that were not found elsewhere on the property. These include two species of relatively large weevils belonging to the genus *Inophloeus* that are vulnerable to rodent predation, which is likely to be more severe at lower altitudes. Two further species of weevils were collected from speargrass plants on the tops that were not present at lower altitudes. The beetle, *Rygmodus* cf. *femoratus*, which has some conservation significance was also found on the range.

Duck Stream Catchment

This area includes about 1.5 km of the Duck Stream riverbed and all parts of the property that drain into Duck Stream. These comprise some east-facing slopes of the Albury Range and the eastern slopes of three hills with rocky tops towards the southern end of the property. The valley bottoms and gently sloping areas are developed pasture. The steeper, upper slopes retain a cover of modified tussockland with patches of shrubland. Despite substantial collecting effort, only low numbers of a few beetle species were collected in the Duck Stream riverbed. However, three of the species collected, *Rygmodus* cf. *femoratus*, *Bembidion parviceps* and *Australeeus* sp., have some conservation significance (Table 4). Typical pasture species including grass grub (*Costelytra zealandica*) and nodding thistle receptacle weevil (*Rhinocyllus conicus*) were collected from developed pasture areas. A velvet worm (Phylum: Onycophora) was collected from the base of a tussock on the slopes above Duck Stream. A small but representative beetle fauna was beaten from prostrate kowhai on the southernmost of the three rocky hills.

Species Recorded

During this survey, 62 terrestrial invertebrate species were collected or observed from 24 collection sites across the property. All were identified at least to tribe except for the velvet worm, and nearly all to genus or species. Forty-nine beetle species from 18 different families were collected, four of which were naturalized species. Seven notable species were collected.

Table 4 Notable invertebrate species recorded from Airies Pastoral Lease, December 2005.

Invertebrate species	Significance	Distribution on property
Australeeus sp.	Rare in collections.	Duck Stream; central valley east of Point 787.
Bembidion parviceps	Not previously known from the South Canterbury or Mackenzie regions.	Duck Stream.
Inophloeus cf. *sulcifer* and *Inophloeus* sp.	Large, flightless weevils, vulnerable to mammalian predation	Ridge crest on the eastern property boundary.
Mimopeus tibialis	A local endemic (only in the Mid- and South-Canterbury regions).	Lows altitude hills throughout.
Onycophora gen. & sp. indet.	Rarely collected in this type of habitat.	Lower slopes, Duck Stream.
Rygmodus cf. *femoratus*	A new species (*R. femoratus* only recorded previously from the Buller Region (Hansen, 1997).	Throughout.

Significance of the Invertebrate Fauna

Seven notable invertebrate species were recorded on Airies Pastoral Lease: one is either a new species or represents a major range extension; another occurs outside its previously known range; one is a local endemic; two are rarely collected; and two are large, flightless species vulnerable to mammalian predation.

2.6.6 Problem Animals

Introduced animal species that may have an important effect on indigenous plant or animal communities on the property, and that can be controlled or contained, are listed and discussed below. Other ubiquitous naturalised species for which containment or control are probably impractical (such as rodents) are not discussed here.

Brushtail possum
Possum sign was observed in rockland habitats throughout lower altitude parts of the property. Possums are browsers of palatable indigenous plants and predators of birds, lizards and invertebrates.

Rabbits and hares
Hares were observed throughout the property, and rabbits were observed at lower-altitudes.

Cats and hedgehogs
Scats (droppings) of cats and hedgehogs were observed throughout the property. These animals are predators of indigenous invertebrates.

Wallaby
Wallabies were observed throughout higher-altitude parts of the property.

Deer
Fallow deer were observed at two locations at higher altitudes on the property.

2.7 HISTORIC

Airies Pastoral Lease was formerly part of Run 358, which was granted to Thomas William Maude in conjunction with Run 357 (Ashwick homestead run) in 1857 (Pinney, 1971). It appears that the property was run as part of Ashwick for some years. In 1889 the property was farmed by Robert Guthrie (Pinney, 1971). There are no known sites of historical significance

2.8 PUBLIC RECREATION

2.8.1 Physical Characteristics

The property is divided into two main recreation settings:

Albury Range

This recreation setting covers the higher-altitude parts of the property on the slopes of the Albury Range. The predominant tall tussockland cover and lack of structures in this area provide a relatively natural setting for recreation. A vehicle track traverses the ridge crest and links with other vehicle tracks that provide access to other parts of the Albury Range. This part of the property is

clearly visible from the Fairlie Tekapo Road (State Highway 8). The range crest provides good views of Burke Pass and the southern Two Thumb Range. The recreation opportunity spectrum classification for this area is Backcountry Accessible (Motorised).

Valleys

This recreation setting covers the lower-altitude valleys and hills, in the Opihi and Rollesby valleys. It is more modified and provides a less natural though still interesting recreation setting. It is traversed by a number of vehicle tracks and contains the homestead and farm buildings. Parts of this area, especially along the Opihi River, are clearly visible from State Highway 8. The recreation opportunity spectrum classification for this are is Rural.

2.8.2 Legal Access

Roads

The only formed legal road in the vicinity of the property is State Highway 8 just across the Opihi River from the northwest property boundary. Unformed legal roads are present across the northern part of the property from State Highway 8 onto the Albury Range, through the central valley on the property just east of the low hillocks, and across the southern part of the property from Rollesby Valley Road to Duck Stream.

Marginal Strips

No marginal strips are present. There is a legal road line present along the Opihi River, on the northwest boundary of the property.

Adjoining Public Conservation Land

A small Conservation Area adjoins the property across the Opihi River to the northwest (Conservation Land Unit I38002). The property adjoins pastoral lease or freehold land on all other boundaries.

2.8.3 Activities

The Albury Range provides opportunities for walking, mountain-biking, horse-riding and four-wheel-drive vehicle use. Airies Pastoral Lease provides opportunities to gain access to the northwest end of the range from a major highway. The property forms an important backdrop for more passive road-based activities such as scenery viewing.

Significance of Recreation

The most significant feature of the property for recreation is its position between the Albury Range and State Highway 8, where it provides a backdrop for travellers on the busy tourist highway between Canterbury and the southern lakes, and has potential to provide access for public recreation on the Albury Range.

PART 3 OTHER RELEVANT MATTERS AND PLANS

3.1 CONSULTATION

Information gathering meetings were held with representatives of non-governmental organisations (NGOs) at Christchurch on 5th September 2005 and at Geraldine on 6th September 2005. Comments made at those meetings are summarised below.

- Tussock-covered slopes on the property are likely to have some natural values.
- Erosion control fencing has been erected at about the 800 m contour.
- Wilding tress should be removed by the lessee before any areas are freeholded.
- Rare fish species are present in the Opihi River adjacent to the property.
- More than one access point is required through the property to provide opportunities for round-trips.
- The Albury Range provides good opportunities for walking and mountain-biking.
- The vehicle track along the Albury Range was originally maintained as a firebreak; this may continue to be an important function of the track.
- Good-quality public access is required, including access for less-fit people.

3.2 DISTRICT PLANS

Airies Pastoral Lease lies within the Rural Zone of the Mackenzie District. There are no Sites of Natural Significance identified on the property. The Mackenzie District Plan contains a number of rules relating to land use activities within sites of natural significance, within riparian areas and in high altitude areas (i.e. areas above 900m):

- No clearance of indigenous vegetation (in the case of riparian areas, no vegetation) to exceed 100m² per hectare in any continuous period of 5 years, except for declared weed pests or for the purpose of track maintenance or habitat enhancement.
- No earthworks to exceed 20m³ (volume) or 50m² (area) per hectare in any continuous period of 5 years, except for the purpose of track maintenance (applies to earthworks in Sites of Natural Significance, riparian areas and over 900m).
- No pastoral intensification to exceed 5% of any Site of Natural Significance, except where that activity is provided for under a consent under the Crown Pastoral Land Act, or other management plan or covenant ratified by the District Council.
- No tree planting in Sites of Natural Significance or above 900m, but forestry up to a maximum of 2 hectares per Certificate of Title is a controlled activity within a wetland and riparian areas.

3.3 CONSERVATION MANAGEMENT STRATEGIES

Airies Pastoral Lease lies within the Pareora Place Unit of the Canterbury Conservancy. Relevant priority objectives for this unit are listed in the CMS (Department of Conservation, 2000) as:

- To identify the significant indigenous vegetation and threatened plant and animal species of the Pareora Unit.
- To use a range of effective methods to protect the indigenous biodiversity of the Pareora Unit.

- To protect and enhance the viability of priority threatened species populations and their habitats in the Pareora Unit.
- To co-operate with and assist rūnanga and the New Zealand Historic Places Trust in protecting rock art sites.
- To survey, monitor and control wallabies on land managed by the Department to levels that minimise their adverse effects on indigenous vegetation.

3.4 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. This strategy is a blueprint for managing the country's diversity of species and habitats. It sets a number of goals to achieve this aim. Of particular relevance to tenure review is Goal 3, which states:

- *Maintain and restore a full range of remaining natural habitats and ecosystems to a healthy functioning state, enhance critically scarce habitats, and sustain the more modified systems 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.*

PART 4 ATTACHMENTS

4.1 ADDITIONAL INFORMATION

4.1.1 Scientific Names of Species

Plant Species

Species names follow those in the published volumes of New Zealand Flora and the name changes listed in A Checklist of Indigenous Vascular Plants of New Zealand, 10th Revision (*Unpublished Document*, S. Courtney, Department of Conservation, Nelson). Maori names are included for taonga species listed in Schedule 97 of the Ngai Tahu Claims Settlement Act 1998. Naturalised species are indicated by an asterisk (*).

Common name	Scientific name
blue tussock	*Poa colensoi*
bracken	*Pteridium esculentum*
bristle tussock	*Rytidosperma setifolium*
broad-leaved plantain*	*Plantago major*
broom*	*Cytisus scoparius*
browntop*	*Agrostis capillaris*
burdock*	*Arctium minus*
cabbage tree/ti rakau	*Cordyline australis*
catsear*	*Hypochoeris radicata*
common pennywort	*Hydrocotyle novae-zeelandiae*
coral broom	*Carmichaelia crassicaule*
coral lichen	*Cladia retipora*
crack willow*	*Salix fragilis*
creeping pohuehue	*Muehlenbeckia axillaris*
elderberry*	*Sambucus nigra*
feathery tutu	*Coriaria plumosa*
fescue tussock	*Festuca* sp.
foxglove*	*Digitalis purpurea*
golden speargrass/taramea	*Aciphylla aurea*
gooseberry*	*Ribes uva-crispa*
gorse*	*Ulex europaeus*
grey poplar*	*Populus* x *canescens*
harebell	*Wahlenbergia albomarginata*
hemlock*	*Conium maculatum*
horehound*	*Marrubium vulgare*
kahikatea	*Dacrycarpus dacrydioides*
king devil hawkweed*	*Hieracium praealtum*
kowhai	*Sophora microphylla*
larch*	*Larix decidua*
lawyer	*Rubus schmidelioides*
matagouri	*Discaria toumatou*
matai	*Prumnopitys taxifolia*
monkey musk*	*Mimulus guttatus*
mountain flax/whaririki	*Phormium cookianum*

mountain kiokio ..... *Blechnum montanum*
mountain ribbonwood/houhi ..... *Hoheria lyallii*
mountain toatoa ..... *Phyllocladus alpinus*
mountain totara ..... *Podocarpus hallii*
mouse-ear chickweed* ..... *Cerastium fontanum*
mouse-ear hawkweed* ..... *Hieracium pilosella*
narrow-leaved snow tussock ..... *Chionochloa rigida*
native broom ..... *Carmichaelia australis/petriei*
native dandelion ..... *Taraxacum magellanicum*
native violet ..... *Viola cunninghamii*
necklace fern ..... *Asplenium flabellifolium*
nettle* ..... *Urtica* sp.
patotara ..... *Leucopogon fraseri*
pohuehue ..... *Muehlenbeckia australis*
porcupine shrub ..... *Melicytus alpinus*
prickly shield fern ..... *Polystichum vestitum*
prostrate kowhai ..... *Sophora prostrata*
pukio ..... *Carex secta*
radiata pine* ..... *Pinus radiata*
red woodrush ..... *Luzula rufa*
rowan* ..... *Sorbus aucuparia*
scabweed ..... *Raoulia australis*
scrub pohuehue ..... *Muehlenbeckia complexa*
sheep's sorrel* ..... *Rumex acetosella*
silver tussock/wi ..... *Poa cita*
snowberry ..... *Gaultheria depressa* var. *novae-zelandiae*
St John's wort* ..... *Hypericum perforatum*
stonecrop* ..... *Sedum acre*
suckling clover* ..... *Trifolium dubium*
sweet brier* ..... *Rosa rubiginosa*
sweet vernal* ..... *Anthoxanthum odoratum*
sycamore* ..... *Acer pseudoplatanus*
tall tussock ..... *Chionochloa* sp.
thistles* ..... *Cirsium* spp.
totara ..... *Podocarpus totara*
tutu ..... *Coriaria sarmentosa*
white clover* ..... *Trifolium repens*
white fuzzweed ..... *Vittadinia australis*
woolly moss ..... *Racomitrium pruinosum*
woolly mullein* ..... *Verbascum thapsus*
Yorkshire fog* ..... *Holcus lanatus*

Animal Species

Species names follow King (1990) for mammals, the June 2003 version of the New Zealand Recognized Bird Names list (compiled by C.J.R. Robertson and D.G. Medway for the Ornithological Society of New Zealand Inc.) for birds, Whitaker (1998) for lizards and McDowall (2000) for fish. Maori names are included for taonga species listed in Schedule 97 of the Ngai Tahu Claims Settlement Act 1998. Naturalised species are indicated by an asterisk (*).

Common name	Scientific name
alpine galaxias	*Galaxias paucispondylus*
Australasian harrier/kahu	*Circus approximans*
Australasian pied stilt/poaka	*Himantopus himantopus leucocephalus*
Australian magpie*	*Gymnorhina tibicen*
banded dotterel	*Charadrius bicinctus bicinctus*
bat	*see* South Island long-tailed bat
Bennett's wallaby*	*Macropus rufogriseus rufogriseus*
black-billed gull	*Larus bulleri*
blackbird*	*Turdus merula*
black-fronted tern	*Sterna albostriata*
black shag/koau	*Phalacrocorax carbo novaehollandiae*
black stilt/kaki	*Himantopus novaeseelandiae*
brook char*	*Salvelinus fontinalis*
brown hare*	*Lepus europaeus occidentalis*
brown trout*	*Salmo trutta*
brushtail possum*	*Trichosurus vulpecula*
California quail*	*Callipepla californica brunnescens*
Canterbury galaxias	*Galaxias vulgaris*
cat*	*see* house cat
chaffinch*	*Fringilla coelebs*
chukor*	*Alectoris chukar*
common bully	*Gobiomorphus cotidianus*
common skink	*Oligosoma nigriplantare polychroma*
dunnock*	*Prunella modularis*
European hedgehog*	*Erinaceus europaeus occidentalis*
European rabbit*	*Oryctolagus cuniculus cuniculus*
fallow deer*	*Dama dama dama*
feral cat* (house cat)	*Felis catus*
goldfinch*	*Carduelis carduelis*
greenfinch*	*Carduelis chloris*
grey warbler/rironiro	*Gerygone igata*
hare*	*see* brown hare
hedgehog*	*see* European hedgehog
house cat*	*Felis catus*
house sparrow*	*Passer domesticus*
koaro	*Galaxias brevipinnis*
longfin eel/tuna	*Anguilla dieffenbachii*
McCann's skink	*Oligosoma maccanni*
New Zealand falcon/karearea	*Falco novaeseelandiae*
New Zealand pipit/pihoihoi	*Anthus novaeseelandiae novaeseelandiae*
paradise shelduck/putakitaki	*Tadorna variegata*
possum*	*see* brushtail possum
rabbit*	*see* European rabbit
redpoll*	*Carduelis flammea*
scree skink	*Oligosoma waimatense*
silvereye	*Zosterops lateralis lateralis*

skylark* ..... *Alauda arvensis*
song thrush* ..... *Turdus philomelos*
Southern Alps gecko ..... *Hoplodactylus* aff. *maculatus* "Southern Alps"
southern black-backed gull/karoro ..... *Larus dominicanus dominicanus*
South Island fantail/piwakawaka..... *Rhipidura fuliginosa fuliginosa*
South Island long-tailed bat..... *Chalinolobus tuberculatus*
South Island pied oystercatcher..... *Haematopus ostralegus finschi*
spotted skink..... *Oligosoma lineoocellatum*
spur-winged plover..... *Vanellus miles novaehollandiae*
upland bully..... *Gobiomorphus breviceps*
wallaby* ..... *see* Bennett's wallaby
welcome swallow ..... *Hirundo tahitica neoxena*
white-faced heron..... *Ardea novaehollandiae novaehollandiae*
yellowhammer* ..... *Emberiza cintrenella*

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