

Crown Pastoral Land Tenure Review

Lease name : CABERFEIDH

Lease number : PT 134

Conservation Resources Report - Part 1

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

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

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

July

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CABERFEIDH PASTORAL LEASE



CONSERVATION RESOURCES REPORT

Department of Conservation

July 2006

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PART 1 INTRODUCTION

Caberfeidh Pastoral Lease is a 2083 ha property located in the lower Hakataramea Valley, north of Kurow in South Canterbury. It covers moderately-steep southeast-facing slopes on the lower southeast end of the Kirkliston Range, and a small area of gentler lower-altitude country further east in the Hakataramea Valley. The main part of the property (the Kirkliston Block) ranges in altitude from 500 m at Kirkliston Stream to 900 m on the mid-slopes of the Kirkliston Range. The small outlying part of the property (the Homestead Block) lies between 400 m and 480 m. A narrow strip of pastoral lease land links the two blocks. The Hakataramea River and its tributaries: Station Stream, Potato Creek, Kirkliston Stream, Padkins Stream and Farm Stream, drain the property. The Hakataramea River is a tributary of the Waitaki River.

Access to the Kirkliston Range part of the property is via Milne Road and Farm Road, from Hakataramea Valley Road. Access to the Homestead Block is via Middle Road, from Milne Road. Unformed legal roads link Middle Road with the northeast corner of the property at Station Stream and link Farm Road with the southern corner of the property near Farm Stream.

The upper parts of the Kirkliston Block of Caberfeidh Pastoral Lease (above c.700 m altitude) lie in the Kirkliston Ecological District, within Waitaki Ecological Region. Other parts of the property lie in Hakataramea Ecological District, within Pareora Ecological Region (McEwen, 1987). These ecological districts have not been surveyed as part of the Protected Natural Areas Programme.

Caberfeidh Pastoral Lease adjoins Invercroy Pastoral Lease at its northeast corner, the Kirkliston Range Conservation Area (Conservation Land Unit I39004) on the upper slopes of the Kirkliston Range to the northwest and freehold land on all other boundaries (see attached map). No parts of the lease are currently subject to protection for conservation purposes. Right of ways have been surveyed on the lease but have not been registered and are not considered in this report.

The tenure review inspection of the property was undertaken during November 2005 and January 2006 by a range of specialists. These specialists' reports (listed below) form the basis of this Conservation Resources Report.

- Caberfeidh Pastoral Lease Landscape Assessment, Alan Petrie, January 2006, 6p + photos + map.
- Plant Communities of Caberfeidh Pastoral Lease and Recommendations for Protection, Carol Jensen, February 2006, 11p + photos + maps.
- Assessment of the Fauna Values of Caberfeidh Pastoral Lease, Jane Sedgely, March 2006, 11p + photos + maps.
- Caberfeidh Pastoral Lease, A Report on the Aquatic Fauna Surveys, Scott Bowie, March 2006, 15p (including photos + maps).
- Invertebrate Assessment of Caberfeidh Pastoral Lease, Simon Morris, February 2006, 5p + maps + appendices.

Note

In this report the two parts of Caberfeidh Pastoral Lease are referred to as the 'Kirkliston Block' and the 'Homestead Block' (refer attached map)

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

2.1 LANDSCAPE

2.1.1 Landscape Context

Caberfeidh Pastoral Lease is located on the southeast-facing flanks of the Kirkliston Range in South Canterbury. The Kirkliston Range, the lower Campbell Hills to the south and The Hunter Hills to the north, enclose the Hakataramea Valley. The Kirkliston Range is representative of a group of low mountains and high hills that separate the South Canterbury coastal plains and downs from the intermontane basins of the upper Waitaki River catchment. The range is relatively narrow and elongated with its northeast-southwest trending ridge gradually ascending from both ends towards a group of high peaks at its centre. These high peaks have periglacial features, such as vertical rock buttresses and sheets of stable talus. Projecting out from the main ridge at regular intervals are rounded spurs descending towards the rolling toe slopes and separated by V-shaped valleys. A distinct feature is the rabbit-proof fence cutting across the toe slopes of the range.

The upper section of the main ridge of the Kirkliston Range is a dominant local landmark. Beyond the confines of the Hakataramea Valley, Mt Milne and its adjoining slopes are visible from State Highway 83 south of Kurow. Within the valley, the Kirkliston Range appears to rise abruptly from the expansive valley floor and is visible from many of the valley's roads.

2.1.2 Landscape Description

For the purposes of this landscape assessment Caberfeidh Pastoral Lease is divided into three 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, Station Stream

This unit covers the Station Stream catchment at the northern end of the property. Its upper extent is the property boundary at the 900 m contour and the lower boundary is, in most places, the rabbit-proof fence at c.600 m. The Station Stream catchment is defined by the saddle between Mt Milne and Mt Kirkliston and long spurs that project out from the saddle to form the splayed V-shaped valley. The upper slopes (beyond the property boundary) are constant, moderately steep, patterned by straight watercourses and feature substantial exposed rock. The slopes within the property boundary are more even, with a concave colluvium-filled valley floor. Alluvial terraces constrict the single channel of Station Stream, which flows over a series of ledges to form small pools.

The Station Stream catchment contains an uninterrupted sequence of grassland communities with tall tussockland dominating the mid altitude slopes and short tussockland and grassland on lower slopes. Sedgeland and shrubland are present along the stream.

Landscape Values

The area between 700 m and 900 m within this unit has high inherent landscape values due to the visual coherence between the different grassland communities. The subtle fusion between the tall tussockland and short grasslands is a feature of this unit. The expansive sward of tussockland contrasts markedly with other major catchments on the property, which are dominated by woody species. The presence of shafts of rock surrounded by tussockland and grassland helps to provide this unit with a distinct character. Below 700 m the grasslands become more modified, are dominated by introduced grasses and have landscape values of lower significance.

Potential Vulnerability to Change

Land uses that have the potential to adversely affect this unit are:

- Further subdivision that would adversely affect the existing uniform character of this unit.
- Further encroachment of matagouri scrub into the grasslands.
- Introduction of structures.
- Further earth disturbance.
- Uncontrolled spread of wilding pines.

Unit 2, Kirkliston Stream

This unit covers all of the mid and lower slopes of the Kirkliston Stream and Potato Creek catchments in the central part of the property, below Mt Milne. The Homestead Block is included in this unit. The upper boundary of the unit along the 900 m contour is indistinguishable from the Kirkliston Range Conservation Area on the upper slopes. The lower boundary follows geometric survey lines that form the property boundary.

The feature that dominates this unit is the large V-shaped valley of Kirkliston Stream, which emerges from deep within the southeast flank of the range. The mid and lower slopes are rounded in form due to the large deposits of loess. Kirkliston Stream flows out towards the Hakataramea Valley floor, bounded by cobbles and boulders, and with small rock ledges and pools. The margins of the stream are well vegetated and lined with a diverse range of native tussockland and shrubland species.

Upper slopes within this unit are dominated by tall tussockland. On and above the upper boundary of the unit, on either side of Kirkliston Stream, are large blocks of conifers which were planted during the 1960s for soil and water conservation purposes. Seedlings from the original plantings have spread across adjoining slopes and are now being cleared by the Department of Conservation. Lower slopes are dominated by short tussockland and grassland, with strong regeneration of matagouri.

Landscape Values

The conifer plantation and the surrounding wilding pine spread limit the landscape values of this unit. The hard edges between the plantation and the cut-over areas have severely compromised both the landscape and scenic values of this unit.

Potential Vulnerability to Change

Land uses that have the potential to adversely affect this unit are:

- Uncontrolled spread of wilding pines.
- Further reversion of grasslands into matagouri scrub.
- The cutting of the conifer plantations into geometric blocks (it would be preferable for these stands of trees to have irregular outlines that imitate the character of dry beech forest remnants).

Unit 3, Farm Stream

This unit encompasses the series of small catchments at the southwest end of the property. The numerous small watercourses that drain this area, including Farm Stream, combine to form Padkins Stream which flows between high alluvial terraces (beyond the property boundary) to the Hakataramea River. The upper boundary of the unit follows the 900 m contour. This unfenced green-line boundary is visually indistinguishable from the Kirkliston Range Conservation Area. The lower boundary of the unit is the property boundary.

The mid and lower slopes of the Kirkliston Range have a sequence of rounded spurs, separated by deep side valleys which merge to the gently rolling country of the Hakataramea Valley. Sheet and gully erosion are present on slopes above this unit (above 900 m). Upper slopes within the unit are dominated by tall tussockland, the stature and density of which varies depending on aspect and position. Sunnier drier slopes have sparser tussock cover, whereas darker slopes support taller denser tussockland. Matagouri-dominated scrub and grassland are present on lower slopes. Large clumps of scrub pohuehue are common, especially in areas where the matagouri has been sprayed. A four-wheel-drive track traverses the slopes to the range crest at the western end of the unit.

Landscape Values

A large proportion of this unit has only moderate inherent landscape values due to the extensive modification of the original vegetation, especially across the lower slopes. The unit does not contain any prominent natural features or landforms. In general terms, this unit is representative of the landscape character of the mid and lower slopes of the Kirkliston Range. A characteristic of the unit is the lack of a hard edge between the property and the adjoining Kirkliston Range Conservation Area, due to the existing unfenced green-line boundary.

Potential Vulnerability to Change

Land uses that have the potential to adversely affect this unit are:

- Uncontrolled spread of wilding pines.
- Further replacement of tall tussocklands with modified grassland.
- Earth disturbance on prominent spurs.

2.1.3 Visual Values

The Hakataramea Valley is concealed from most public viewing points by the surrounding low mountains and high hills, however within the Hakataramea Valley, the upper slopes of the Kirkliston Range are a dominant landscape element. The mid and lower slopes are less conspicuous as they are not clearly visible from Hakataramea Valley Road.

The mid and lower slopes of the Kirkliston Range convey a relatively disjointed character due to the patch-like vegetation; these discordant characteristics are most noticeable within landscape units 2 and 3 where there is strong regeneration of matagouri scrub. The block of conifers in the Kirkliston Stream catchment is one of the most significant landscape features on the range, with the dark green of the pines contrasting markedly with the lighter colours of the surrounding tussockland.

Significance of Landscape Values

The Kirkliston Range is generally representative of the cluster of low mountains and high hills that separate South Canterbury's downs and coastal plains from the large intermontane basins. Within this wider context, the Kirkliston Range helps to enclose the large Hakataramea Valley, which is distinctive because of its expansive bowl-like shape and sense of seclusion. The upper slopes of the Kirkliston Range (beyond the property boundary) have significant inherent landscape values. Modification of the mid and lower slopes (within the property boundary) reduce the inherent landscape values, except in Station Stream (Landscape Unit 1) where the indigenous vegetation is more intact and the transition between vegetation types is less pronounced. The presence of impressive rock formations is a significant feature of this unit.

2.2 GEOLOGY, LANDFORMS AND SOILS

2.2.1 Geology

The basement rocks of the main part of Caberfeidh Pastoral Lease, on the Kirkliston Range, are schistose to non-schistose quartzofeldspathic sandstone (greywacke) interbedded with mudstone (argillite) of Permian age. Minor areas of volcanic horizons and alluvial gravel, sand and silt are present in the Station Stream area. Hill slopes are mantled with deposits of loess (wind-deposited sediments). Gentler lower slopes on the property comprise moderately to highly weathered brown gravel in a highly weathered sandy matrix and overlain by up to three layers of loess. Low stream terraces comprise recently-deposited gravel, sand and silt. The Kirkliston Fault Zone traverses the toe of the steeper slopes through the property along the base of the Kirkliston Range (Forsyth, 2001).

2.2.2 Landforms

Two distinct landforms are present on Caberfeidh Pastoral Lease: the moderately-steep slopes of the Kirkliston Range on the western side of the property and the gentler toe slopes, terraces and valleys on the eastern side of the property. The slopes of the Kirkliston Range comprise rounded spurs and relatively large and occasionally incised gullies. The lower slopes are gentle and even, sloping southeast to the Hakataramea River and indented by the shallow valleys of the streams flowing from the Kirkliston Range. The Kirkliston Fault Zone defines the boundary between these two landforms. No geopreservation sites are listed for the property.

2.2.3 Soils

Higher altitude parts of the property on the Kirkliston Range have Tengawai steepland soils and smaller areas of Kaikoura steepland soils. Gentler lower-altitude slopes are largely Tengawai hill soils and Sherwood silt loams. Soil in the Homestead Block is Hakataramea silt loam.

Significance of Geology, Landforms and Soils

The Kirkliston Range, upon which the property is located, is similar in form to the surrounding mountain ranges and is transitional in character between the mountain ranges of Canterbury and Otago. There are no geopreservation sites listed for the property.

2.3 CLIMATE

Caberfeidh Pastoral Lease has a cool 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 700 mm (Tomlinson, 1976), though precipitation may vary with altitude. 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)

LENZ is, as described by Leathwick *et al.* (2003): “a classification of New Zealand’s landscapes using a comprehensive set of climate, landform and soil variables chosen for their role in driving geographic variation in biological patterns.” The classification units of LENZ, termed environments by Leathwick *et al.* (2003), aim to: “identify areas of land having similar environmental conditions regardless of where they occur in New Zealand.” The consequences of this are that “LENZ provides a framework that allows prediction of a range of biological and environmental attributes. These include the character of natural ecosystems, the vulnerability of environments to human activity, and the potential spread or productivity of new organisms (Leathwick *et al.* 2003).” Leathwick *et al.* (2003) present the LENZ information at four levels of detail, with level I containing 20 environments, level II containing 100 environments, level III containing 200 environments and level IV containing 500 environments. These LENZ classes are presented nationally to assist use at a range of scales; 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.

In an analysis of the LENZ level IV data, with consideration of the remaining indigenous vegetation cover and the legal protection of these environments, Walker *et al.* (2005) proposed a threat classification for the remaining indigenous biodiversity in New Zealand’s environments based on the two components of vulnerability (likelihood of loss): poor legal protection and risk of loss. This threat classification (Table x) has become the recognised benchmark for the promotion of threatened LENZ conservation.

Table 1 LENZ threat categories and definitions (Walker *et al.* 2005)

Category	Criterion
Acutely Threatened	<10% indigenous cover remaining
Chronically Threatened	10-20% indigenous cover remaining
At Risk	20-30% indigenous cover remaining
Critically Underprotected	>30% indigenous cover remaining <10% legally protected
Underprotected	>30% indigenous cover remaining 10-20% legally protected
No Threat Category	>30% indigenous cover remaining >20% legally protected

Gentle low-altitude sites at the eastern edge of the Kirkliston Block of the property (Classes N3.1a and N3.3a) are “acutely-threatened”. The Homestead Block and low-altitude sites along Kirkliston

LENZ Map

Stream (N3.1d) are “chronically threatened”. Gentle toe slopes (E4.1b and Q2.1c) are “at risk”. All other, mostly higher-altitude, parts of the property (N4.1c, Q2.1b and Q2.1a) are “critically under-protected” (see attached map).

Significance of Land Environments

Gentler lower-altitude parts of Caberfeidh Pastoral Lease (12% of the property) are classified as “much reduced” (acutely- or chronically-threatened) land environments. These three land environments (N3.1a, N3.1d and N3.3a) have 1% or less of their total area legally protected. Most of the remaining parts of the property (79%) are classified as “at risk” or “critically under-protected” land environments (E4.1b, N4.1c, Q2.1a, Q2.1b and Q2.1c), with less than 10% of their total area legally protected.

2.5 VEGETATION

2.5.1 Ecological Context

The upper parts of the Kirkliston Block of Caberfeidh Pastoral Lease (above c.700 m altitude) lie in the Kirkliston Ecological District, within Waitaki Ecological Region. Other parts of the property lie in Hakataramea Ecological District, within Pareora Ecological Region (McEwen, 1987). These ecological districts have not been surveyed as part of the Protected Natural Areas Programme.

McEwen (1987) describes the former (pre-European) vegetation of the area as extensive narrow-leaved snow-tussock at montane and subalpine sites, silver tussock and fescue tussock at lower altitude sites, and scrub and mixed hardwood or mountain totara forest in gullies. In a recent review of the origin of indigenous grasslands, McGlone (2001) proposes that the original (pre-human) vegetation of South Canterbury was dominated by grassland and scrub in the intermontane basins, with low-stature forest on the range slopes. Basin grasslands, he suggests, were dominated by species of *Poa*, *Festuca*, *Elymus* and *Rytidosperma*; scrub by species of *Coprosma* and *Myrsine*; and, forest by mountain totara. McGlone proposes that tall tussock (*Chionochloa* species) were generally confined to higher-altitude sites.

It appears likely that most low-altitude (below 700 m) parts of Caberfeidh Pastoral Lease formerly supported short tussockland (dominated by *Festuca* and *Poa* species) and scrub, with areas of shrubland and scrub along stream sides, and perhaps scattered patches of cabbage tree, kowhai and mountain ribbonwood. The lower slopes of the Kirkliston Range are likely to have supported mountain totara forest, scrub and/or tall tussock grassland, depending on the site and the frequency of natural fires. The range summit probably supported a mosaic of snow tussockland, cushionfield, rockland and stonefield, similar to the vegetation present today.

2.5.2 Vegetation and Flora

The present-day vegetation of Caberfeidh Pastoral Lease is mainly snow tussockland on higher slopes with matagouri scrub, short tussock and exotic grassland on the gentler lower slopes. Most of the property below about 700 m altitude has been developed for pastoral farming and now supports a modified cover of matagouri, short tussock, exotic grasses and clovers. Much of the induced matagouri shrubland extending along the lower slopes has been sprayed with herbicide. A few small native shrubland remnants are present along streams and gullies. Above c.700 m short tussock and matagouri merge into snow tussockland that extends up slope beyond the property boundary to the ridge crest. The condition and naturalness of the tussockland generally increases with altitude. These indigenous plant communities are described below for the lower and upper parts of Caberfeidh Pastoral Lease.

Lower-altitude Slopes, Terraces and Gullies

This area covers the gentle toe slopes, terraces and gullies below the fence running along approximately the 600 m contour. Most of this part of the property has been developed for pastoral farming and has a high component of introduced grasses, clovers and herbs. The few native scrub remnants are now confined to terrace risers along streams.

Matagouri shrubland covers a terrace riser above Kirkliston Stream in the Homestead Block. Other shrubs present in this shrubland are *Coprosma propinqua*, native broom, porcupine shrub, *Olearia odorata* and scrub pohuehue with occasional *Clematis marata* scrambling through the matagouri. In clearings amongst the matagouri shrubland are silver tussock and introduced grasses including cocksfoot, sweet vernal, browntop, Yorkshire fog and various bromes. A small wetland is present along the base of the matagouri shrubland with pukio, *Carex coriacea* and rushes present.

A similar matagouri shrubland covers terrace risers above lower Farm Stream. Other native species present within this pasture-shrubland community are porcupine shrub, *Coprosma rugosa*, *C. propinqua*, native broom, with *Clematis marata*, pohuehue and scrub pohuehue sometimes scrambling through the matagouri. In the stony creek bed, creeping pohuehue, *Acaena inermis* and silver tussock are present. Also present are crack willow, gooseberry, woolly mullein, nettle, hemlock, nodding thistle, sweet brier and numerous exotic grasses and clovers.

Further upstream where the track crosses the northern branch of Farm Stream there is an area of matagouri-dominated shrubland covering the stream bed and terrace risers. On the steep terrace riser are six broadleaf trees. Some of these trees are showing severe dieback presumably as a result of herbicide spray. Also present and apparently healthy are *Olearia odorata*, *O. bullata*, *Coprosma rugosa*, *C. propinqua*, native broom, tauhinu, pohuehue and sweet brier. Beneath the shrub canopy, prickly shield fern and *Blechnum penna-marina* are present. On the stony stream bed in small clearings amongst the matagouri are silver tussock, creeping pohuehue, foxglove, woolly mullein, elderberry and mouse-ear hawkweed.

Steeper Upper Slopes

This area covers the steeper hill slopes above the fence that roughly follows the 600 m contour. The area is characterised by moderately steep slopes drained by steep-sided small streams. On the lower slopes the vegetation is mainly silver tussock grassland with a high component of exotic grasses and clovers. Dense induced matagouri covers much of the slopes, merging into tall dense narrow-leaved snow-tussockland at about 700 m. Large areas of matagouri scrub appear to have been treated with herbicide. Species commonly present within this pasture-shrubland community are porcupine shrub, scrub pohuehue and silver tussock. Occasionally present are pohuehue, elderberry, foxglove, thistles, *Coprosma propinqua*, native broom, sweet brier, bracken, gooseberry, St John's wort and monkey musk.

A block of pine tree and surrounding areas of wilding tree spread are present in the Kirkliston Stream catchment. The Department of Conservation has been controlling the tree spread, though ongoing control will be required for some time. Where scattered pines have been felled, native species including narrow-leaved snow-tussock, inaka, mountain flax, *Gaultheria crassa* and numerous native herbs have regenerated well.

At mid altitudes (600-700 m) the vegetation cover is mainly modified short tussock grassland and matagouri scrub. The grassland typically has scattered silver tussock with a grazed short turf of browntop, Chewings fescue, Yorkshire fog, and some Maori onion in damper areas. A spraying programme in recent years has reduced the cover of dense matagouri scrub on the mid slopes. Although some native shrubs appear resistant to the spray, broadleaf trees, native broom and speargrass appear to have succumbed. On a slope above the true left branch of Farm Stream, more than 40 dead broadleaf trees are surrounded by dead matagouri scrub. Some still-green broadleaf

trees show damaged, browned off, outside leaves. Koromiko, *Coprosma rugosa* and pohuehue are still present. Further upstream there is a big old broadleaf tree and upstream from this point the vegetation appears undamaged with several young broadleaf trees and healthy native broom and speargrass. Small native herbs present in the stream bed include *Parahebe decora*, harebell and *Anaphalioides bellidioides*.

Where the track crosses the southern branch of Farm Stream, most of the matagouri is dead but there is a large copse of *Coprosma rugosa* and several *Olearia odorata*. About 200 m upstream from this point is a single large kowhai; the only one seen on the property.

Above 700 m the matagouri becomes more scattered as the vegetation merges into narrow-leaved snow-tussockland. Near the southern branch of Farm Stream at 700 m is a solitary broadleaf tree surrounded by *Coprosma propinqua*, tutu, native broom and lawyer. Above this point is a small population of coral broom hidden amongst narrow-leaved snow-tussock. In the valley floor there is a dense patch of *Coprosma propinqua*, *C. rugosa*, tutu, matagouri, tauhinu, *Olearia odorata*, mountain flax and toetoe. On the dry north-facing slopes the matagouri becomes less dense and narrow-leaved snow-tussock and golden speargrass are more common. Also present are considerable amounts of mouse-ear hawkweed and the exotic grasses sweet vernal, Chewings fescue and Yorkshire fog. A variety of native grasses are also present including fescue tussock, *Elymus solandri*, *Lachnagrostis filiformis*, *Deyeuxia avenoides* and *Dichelachne crinita*. On the slopes above Farm Stream are two mountain totara; the only mountain totara seen on the property.

As altitude increases the narrow-leaved snow-tussockland becomes denser with fewer adventive species present. At the time of survey the narrow-leaved snow-tussock was flowering profusely. Near the southwest boundary of the property (at about 900 m) there is a diverse number of inter-tussock species amongst the dominant narrow-leaved snow-tussock, including *Raoulia subsericea*, *Pentachondra pumila*, *Lobelia linnaeoides*, *Lycopodium fastigiatum*, *Brachyglottis bellidioides*, *Celmisia gracilentia*, *Pimelea pseudo-lyallii*, *Kelleria dieffenbachii*, patotara, harebell, red woodrush, native violet and snowberry. Occasionally present are golden speargrass, *Gaultheria crassa*, *Scleranthus uniflorus*, *Celmisia lyallii*, *Anisotome flexuosa*, *Anaphalioides bellidioides*, and the native grasses blue tussock, *Deyeuxia avenoides*, *Hierochloa alpina* and rarely, the herb, *Ranunculus crithmifolius*. A few exotic species (mouse-ear hawkweed, tussock hawkweed, sheep's sorrel and catsear) are present but infrequent.

Above 700 m in Station Creek at the northern end of the property, vegetation cover is predominantly narrow-leaved snow-tussock with some small areas of shrubland on the banks and terraces above the stream. Shrubs present include *Coprosma rugosa*, *C. propinqua*, *Olearia bullata*, *O. odorata*, koromiko, *Gaultheria crassa*, native broom, inaka, matagouri and a small population of coral broom. Also occasionally present are *Celmisia lyallii*, *Aciphylla scott-thompsonii*, *Ourisia caespitosa*, tutu and mountain flax. On stony areas in the stream bed and terrace are creeping pohuehue, *Anaphalioides bellidioides*, *Raoulia tenuicaulis*, harebell, *Epilobium melanocaulon* and *Blechnum penna-marina*.

Notable Species Recorded

Plant species listed as threatened by de Lange *et al* (2004) and other notable plant species observed during this inspection of Caberfeidh Pastoral Lease are listed in Table 2 below.

Botanical Values Map

Table 2 Notable plant species, Caberfeidh Pastoral Lease, January 2006.

Plant Species	Threat Status	Distribution on Property
<i>Carmichaelia crassicaule</i> (coral broom)	Gradual decline.	A few small populations at both ends of property.
<i>Pimelea pseudolyallii</i>	Sparse.	Scattered on mid altitude tussock slopes.
<i>Griselinia littoralis</i> (broadleaf)	Not threatened; locally uncommon.	A good population in Farm Stream but many dead or damaged.
<i>Podocarpus hallii</i> (mountain totara)	Not threatened; locally uncommon.	Two trees present on upper slope above Farm Stream.
<i>Sophora microphylla</i> (kowhai)	Not threatened; locally uncommon.	One tree present at southern end of property.

Significance of Vegetation and Flora

Indigenous plant communities on higher-altitude parts of Caberfeidh Pastoral Lease (generally above 700 m) on the southeast-facing slopes of the Kirkliston Range, have significant inherent values. This area supports intact tall tussockland with a high diversity of inter-tussock species and high naturalness values. Populations of threatened plant species (coral broom and *Pimelea pseudolyallii*) are present. The area also supports species (mountain totara and broadleaf) that are representative components of the original vegetation. The terrace risers at lower altitudes have significant inherent values. The species found here are typical of the dry shrublands of Canterbury and representative of the original shrubland communities of this area.

2.5.3 Problem Plants

Introduced plants 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 and broom

A single gorse bush is present where the track crosses Farm Stream in the southern part of the property. Small infestations of broom present on the property have been sprayed. Continued control of infestations of gorse and broom will be required to protect conservation values on the property and to reduce the risk of these weeds becoming established in the adjoining Kirkliston Range Conservation Area.

Elderberry and rowan

Scattered elderberry trees are present throughout lower-altitude parts of the property, usually as isolated trees. A row of rowan trees is present near the boundary on the homestead block. Fruits of these species are readily dispersed by birds. Ideally all these trees should be removed.

Other weeds

Crack willow, grey willow, alder, 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 pines

The most significant area of wilding trees on the property is that adjacent to the exotic plantings in the Kirkliston Stream area. This area comprises 1.4 hectares of mature closed canopy, 7.7 hectares

of dense regeneration, 8.1 hectares of light regeneration and 10.7 hectares of maintenance over previously cleared areas.

Another area of wilding spread is present south of the main Kirkliston Stream and is under a maintenance control regime, with the current infestation ranging from young regeneration to occasional scattered trees. A number of small individual pine trees were also seen around the zig-zag track in the Farm Stream catchment, and there are likely to be occasional wilding trees elsewhere on the property.

The Department of Conservation is committed to a long-term programme to eradicate wilding trees from the Kirkliston Range Conservation Area and to control any trees that have spread from the original plantings onto adjoining land.

2.6 FAUNA

2.6.1 Bats

Short-tailed bats have not been recorded in Canterbury since the arrival of Europeans. A small population of South Island long-tailed bats is present in South Canterbury. The closest bat records to Caberfeidh Pastoral Lease are from the Tengawai River (Sedgeley, 2002a). The property was not surveyed for bats because bat roosting and feeding habitats (forest and mature shrubland) are not present on the property.

2.6.2 Birds

Areas surrounding Caberfeidh Pastoral Lease are mostly highly modified and dominated by farmland. No substantial stands of forest are present in this part of the Hakataramea Valley, so birds present are limited to species of shrubland, open country and riverbed habitats. New Zealand falcon (threat status: gradual decline) have been recorded in the area and riverbed species recorded along the nearby Hakataramea River (McEwen, 1987). A flock of 68 black-billed gulls (serious decline), South Island pied oystercatcher and southern black-backed gull were observed in cultivated paddocks east of the property during the present survey. Paradise shelduck, Australasian harrier, New Zealand pipit and welcome swallow have been recorded on the neighbouring Invercroy Pastoral Lease (Sedgeley, 2002b). Birds observed on the property are described below for the parts of the property surveyed.

Station Stream Valley

Habitats present in the Station Stream valley at the northern end of the property are tussockland, sedgeland (in a small wetland), stonefield (scree), rockland and shrubland. Stream-side shrublands provide feeding and breeding habitat for silveryeye and welcome swallow. Yellowhammer and skylark were abundant in the tussocklands.

Kirkliston Stream Valley

The upper part of the Kirkliston Stream is dominated by a large block of conifers and surrounding wilding pines. Matagouri-dominated shrubland grows along the stream margins, tall tussockland is present on the valley floor, and tussockland, scree and rock outcrops are present on the valley sides. Silveryeyes were present throughout the shrublands. Two New Zealand falcons were heard calling, and one was observed perched on a rock outcrop. New Zealand falcons are sighted regularly in the valley by work crews felling wilding pines (Darrin Woods, *pers.comm.*). The rock outcrops are likely to provide suitable nesting habitat for New Zealand falcon.

Farm Stream (mid to lower reaches)

This part of Farm Stream is highly modified and matagouri in this area has been sprayed. Indigenous shrubland and patches of exotic trees are present along the stream. Otherwise the area is dominated by grassland with silver tussock and patches of low-stature matagouri. Silvereve, grey warbler and South Island fantail were recorded in the shrublands. Australasian harrier, southern black backed gull and paradise shelduck were present in the grasslands. Ten introduced passerines were also recorded.

Southwest Corner

Habitats in this area are tall tussockland with scattered rock outcrops, inaka-dominated shrubland at higher altitudes, and short tussockland and matagouri-dominated shrubland at lower altitudes. Australasian harrier, paradise shelduck and southern black-backed gull were recorded in the open habitats, and welcome swallow and silvereve in the shrublands. Australian magpie and a range of small introduced passerines were also recorded.

Homestead Block

This area supports highly-modified grassland and small areas of shrubland and sedgeland. Australasian harrier and southern black backed gull were feeding over the paddocks, and welcome swallows were nesting in the stream bank.

Species Recorded

Twenty-three bird species were recorded from Caberfeidh Pastoral lease during this inspection: eight indigenous species (Table 3) and fifteen naturalised species.

Table 3 Indigenous bird species recorded from Caberfeidh Pastoral Lease, January 2006.

Bird species	Threat status	Distribution on property
Australasian harrier	Not threatened.	Throughout.
grey warbler	Not threatened.	Shrubland throughout.
New Zealand falcon	Gradual decline.	Kirkliston Stream Valley.
paradise shelduck	Not threatened.	Farm Stream.
silvereve	Not threatened.	Shrubland throughout.
southern black backed gull	Not threatened.	Throughout.
South Island fantail	Not threatened.	Farm Stream shrubland.
welcome swallow	Not threatened.	Throughout; nesting on the banks of Farm and Kirkliston streams.

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

Significance of the Bird Fauna

Twenty-three bird species were recorded from Caberfeidh Pastoral lease during this inspection, including eight indigenous species. One threatened bird species occurs on the property: New Zealand falcon (gradual decline). Most higher-altitude parts of the property provide suitable habitat for this species. The property is contiguous with more extensive areas of high-altitude habitat on the Kirkliston Range.

2.6.3 Lizards

The Department of Conservation's Herpetofauna Database contains records of several lizard species from this region, though none from Caberfeidh Pastoral Lease or from locations close to the property. Green skink (gradual decline) and jewelled gecko (gradual decline) have been recorded at Lake Waitaki, approximately eight kilometres southwest of the property. McCann's skink and common skink have been recorded at the Hakataramea River, approximately nine kilometres east of the property and on the western side of the Kirkliston Range approximately ten kilometres away. Southern Alps gecko, common skink and McCann's skink have been recorded on the neighbouring Invercroy Pastoral Lease (Sedgeley, 2002b). Lizards observed on the property are described below for the parts of the property surveyed.

Four lizards were recorded in the Station Stream valley: two Southern Alps geckos and two McCann's skinks.

Potato Creek was not checked during this inspection due to wet and cold weather conditions. However, a spotted skink or green skink was seen and photographed here on a small area of stable rocks and shrubland on a grassy face several weeks earlier (Darrin Woods, *pers.comm.*).

Ten lizards were recorded in the Kirkliston Stream valley: one Southern Alps gecko and nine McCann's skinks.

Eight lizards were recorded under boulders at the side of Farm Stream: two Southern Alps geckos, four McCann's skinks and two common skinks.

Thirty-four lizards were found at the southwest end of the property: nine Southern Alps gecko, 21 McCann's skinks and four skinks that were not positively identified (common skink or McCann's skink).

Species Recorded

Fifty-seven lizards were recorded from 27 different locations on the property during this survey. Three lizard species were observed, and a fourth lizard species was observed on the property several weeks prior to the survey. McCann's skink and Southern Alps gecko were common throughout. Common skink was recorded beside Farm Stream. Spotted skink or green skink (the taxonomy of these species is being revised) was observed in the Potato Creek area.

Significance of the Lizard Fauna

The property provides good habitats for three common species of lizard. The Potato Creek area provides habitat for a threatened species of lizard: spotted skink or green skink (gradual decline). Lizard habitats on the property are contiguous with more extensive areas of favourable habitat on the Kirkliston Range.

Bird and Lizard values

2.6.4 Freshwater Fauna (fish and invertebrates)

Caberfeidh Pastoral Lease lies in the Hakataramea Valley within the catchment of the Waitaki River. The property is drained by tributaries of the Hakataramea River, including Station Stream, Potato Creek, Kirkliston Stream, Padkins Stream and Farm Stream. A feature of the Hakataramea River is that it is the only large tributary of the Waitaki River that is not affected by dams. This has two effects on the fish communities. The first is that diadromous species (those species with a sea-going phase in their lifecycle) are more likely to be present. The second effect is that fish are able to move between catchment tributaries, allowing re-colonisation of streams.

The New Zealand Freshwater Fish Database (NZFFD) has 890 records from the Waitaki River catchment (at 8th February 2006). Species recorded from streams near the property are longfin eel, koaro, Canterbury galaxias, lowland longjaw galaxias, upland bully, common bully, rainbow trout, Chinook salmon and brown trout. Longfin eel has a threat status of gradual decline and lowland longjaw galaxias has a status of nationally critical (Hitchmough and Bull, *in press*; Hitchmough, 2002).

Caberfeidh Pastoral Lease comprises four main geographical areas of freshwater habitat, each covering the main stream catchments: Station Stream, Potato Creek, Kirkliston Stream and Farm Stream (including Padkins Stream). Freshwater habitats and the fish and macro-invertebrate species recorded are described below for each of these areas.

Station Stream

Station Stream flows from the slopes of Mt Kirkliston and Mt Milne above the property boundary. It drains approximately 260 hectares of the northern part of the property, forming a large forked stream with a series of small waterfalls in its mid to lower reaches. The waterfalls act as natural barriers to introduced fish migration. A small water-race flows from the stream near the lower property boundary and a small ephemeral stream is present as well. The main riparian vegetation along Station Stream and the ephemeral stream is tutu, matagouri, *Coprosma* shrubs, grasses and monkey musk. The water-race flows through grassland. Stock and wild animal access is unrestricted. Vehicle tracks cross the stream near the lower property boundary. Station Stream is about three and a half metres wide and 200 mm to 300 mm deep, with holes up to 700 mm deep in places. The water-race is about one metre wide and about 200 mm deep. The substrate of Station Stream is mainly boulders and cobbles, with areas of bedrock.

Two sites in Station Stream were electro-fished. Canterbury galaxias were found at both sites and upland bully at one site. Additional species recorded from this catchment are brown trout, common bully and koaro (NZFFD). Macro-invertebrates observed in this catchment were *Archichauliodes diversus*, *Deleatidium* spp., *Stenoperla prasina*, *Hydrobiosis* sp, *Olinga feredayi* and *Pycnocentria* sp.

Potato Creek

Potato Creek flows from the slopes of Mt Milne above the property boundary. It drains approximately 310 hectares of the central part of the property, and incorporates a series of small, ephemeral streams flowing into a larger gentle-gradient stream. It includes the largest area of ephemeral streams on the property. A small area of pine trees is present in headwaters of Potato Creek. Otherwise, the stream and its tributaries flow through tussockland and shrubland in the upper catchment and modified grassland near the lower property boundary. Stock and wild animal access appears unrestricted. Vehicle tracks cross the streams near the lower property boundary. The ephemeral tributaries are mostly grassed, so it is difficult to determine the size of the flows they occasionally carry. The main stem of Potato Creek is about two metres wide and between 100 and 400 mm deep, with a cobble and gravel substrate.

One site in this catchment was electro-fished. Canterbury galaxias and upland bully were found. Macro-invertebrates observed in this catchment were *Archichauliodes diversus*, *Coloburiscus humeralis*, *Deleatidium* spp., *Hydrobiosis* sp, *Olinga feredayi* and *Pycnocentria* sp.

Kirkliston Stream

Kirkliston Stream flows from the slopes of Mt Milne above the property boundary. It drains approximately 480 hectares of the central part of the property and provides a water supply for properties in the Hakataramea Valley. Kirkliston Stream also drains the small Homestead Block of the property. It is a single-channel permanent stream with two major branches. A large pine plantation is present at and above the upper property boundary. This plantation and areas of wilding pine spread are being progressively removed by the Department of Conservation. Otherwise, the stream flows through tussockland and shrubland on the upper part of the property and grassland and willow trees at the lower boundary and in the Homestead Block.

Cattle access is restricted above the water supply intake. Vehicle tracks cross the lower parts of the stream. The width of Kirkliston Stream varies from about one metre in the headwaters of its southern branch to about four metres in its main stem on the gentler lower slopes. Most parts of the stream are 100 mm to 200 mm deep, although holes of more than 600 mm are present in some areas. The stream substrate is mostly boulders and cobbles, with areas of bedrock in its upper reaches.

Four sites in the Kirkliston Stream catchment were electro-fished, two in the upper reaches above the main forks and two in the wider and gentler lower reaches. No fish were found in the upper reaches. Brown trout, Canterbury galaxias and upland bully were found in the lower reaches. Additional species recorded from this catchment are common bully and rainbow trout (NZFFD). Macro-invertebrates observed in this catchment were *Archichauliodes diversus*, *Ameletopsis perscitus*, *Coloburiscus humeralis*, *Deleatidium* spp., *Stenoperla prasina*, *Helicopsyche albescens*, *Hydrobiosis* sp, *Olinga feredayi* and *Pycnocentria* sp.

Farm Stream

Farm Stream flows from the slopes of the Kirkliston Range above the property boundary. It drains approximately 1070 hectares of the southern part of the property and includes a number of small permanent and ephemeral streams flowing into a larger gentle-gradient stream. These tributary streams flow through tussockland, shrubland and scrub in their upper reaches, and more modified vegetation, including willow trees, in their lower reaches. Stock and wild animal access appears unrestricted, although topography may limit access in places. Several vehicle tracks cross the streams in this catchment, mostly through fords and occasionally over culverts. The steeper-gradient streams are generally between one and two and a half metres wide; the gentler-gradient streams are between two and a half and three metres wide. Most streams are 100 to 300 mm deep with occasional holes up to 500 mm deep. Stream substrates vary from boulders and cobbles in most streams to mud in others.

Four sites in this catchment were electro-fished, two in the steeper streams and two in the gentler streams. Brown trout were found at three sites, Canterbury galaxias at two sites and upland bully at one site. Additional species recorded from this catchment are common bully, koaro and rainbow trout (NZFFD). Macro-invertebrates observed in this catchment were *Archichauliodes diversus*, *Ameletopsis perscitus*, *Coloburiscus humeralis*, *Deleatidium* spp., *Stenoperla prasina*, *Helicopsyche albescens*, *Hydrobiosis* sp, *Hydropsychidae* sp., *Olinga feredayi* and *Pycnocentria* sp.

Aquatic values Map

Species Recorded

Three fish species were recorded during this survey of Caberfeidh Pastoral Lease (Table 4). A diverse range of aquatic macro-invertebrates including insect larvae and worms was found.

Table 4 Fish species recorded from Caberfeidh Pastoral Lease, January 2006.

Fish species	Threat status	Distribution on property
brown trout	Introduced.	Farm Stream and Kirkliston Stream.
Canterbury galaxias	Not threatened.	Many permanent waterways.
upland bully	Not threatened.	Many permanent waterways.

Significance of the Freshwater Fauna

Two threatened species, longfin eel (gradual decline) and lowland longjaw galaxias (nationally critical), occur in the Hakataramea River downstream from the property, though neither species was recorded during this survey of Caberfeidh Pastoral Lease. Freshwater habitats on the property are in relatively good condition and are free of introduced fish in their upper reaches. Streams on the property are part of a freshwater ecosystem ranked as Waters of National Importance Type II (Chadderton *et al*, 2004). The upper reaches of Kirkliston Stream are the source of a reticulated water supply for properties in the area.

2.6.5 Invertebrates

No entomological information relevant to this assessment was available prior to this survey. Invertebrates of Caberfeidh Pastoral Lease are described below for the main parts of the property surveyed.

Upper Slopes

This area covers the upper southeast-facing slopes of the Kirkliston Range within the property boundary (between 800 m and 900 m altitude). Shrubland communities in this area provide good habitat for ground-dwelling invertebrates, including cockroaches, beetles, weevils, mites, slaters, woodlice, ants, springtails, jumping spiders, wolf spiders and centipedes. A rich diversity of flies is present in the shrublands, including species of blowfly, house fly, soldier fly, hover fly and crane fly. On the shrubland foliage, numerous spiders, caterpillars and ichneumon wasps were observed.

Small rock outcrops in this area provide habitat for black cicadas, flies, wasps and cockroaches. Other insects present in the vicinity are ants, brown blowfly, crane flies, hover flies, robber flies, ichneumon wasps, solitary bees, spider wasps, ground-nesting sub-social bees, black crickets, spiders, longhorned grasshoppers and cockroaches. Tussocklands here provide habitat for ground beetles, blue blowflies, brown blowfly, spiders, cicadas, boulder copper butterfly, copper butterflies, cockroaches, weevils, southern blue butterfly, centipedes, millipedes, shield bugs and ants.

Several species of solitary bees, ants, ground-nesting sub-social bees, parietic wasps, spider wasps, robber flies, flies and mason wasps were observed throughout the upper slopes. Tiger beetle larvae burrows were abundant in clay banks and sandy areas. An unnamed species of grasshopper is present above 800 m on the northern part of the property. This species has been collected only on the eastern side of the Kirkliston Range. An unnamed species of carabid beetle (*Oregus* sp.) was collected from an altitude of c.700 m beside Station Stream.

Invertebrate Values Map

Valleys

Station Stream, Potato Creek, Kirkliston Stream and Farm Stream provide a range of habitats in relatively good condition. A rich diversity of aquatic invertebrates is present, including species of caddisfly, mayfly, stonefly, fly, damselfly and beetle. A diverse invertebrate fauna was observed in the shrubland and tussockland communities along the stream margins, including ants, butterflies, blowflies, crane flies, hover flies, robber flies, ichneumon wasps, solitary bees, spider wasps, ground-nesting sub-social bees, ground beetles, tiger beetles, darkling beetles, spiders, longhorned grasshoppers, shorthorned grasshoppers and cockroaches. Along the clay banks large numbers of mason wasps, ground-nesting bees, solitary bees and spider wasps were observed.

Present in open riverbed communities are ants, butterflies, flies, ground beetles, tiger beetles and spiders. Several small alluvial terraces along Station Stream support a rich biodiversity of invertebrates. Diurnal moths were common and many species appear to be well represented. Several species of flatworm were observed near Farm Stream.

Lower Slopes

This part of the property is predominantly pasture and supports only common agricultural insects. However, small isolated patches of grassland along the Station Stream support the New Zealand grasshopper, black crickets, ants and wasps.

Notable Species

An unnamed species of grasshopper is present above 800 m on the northern part of the property. This species has been collected only on the eastern side of the Kirkliston Range. An unnamed species of carabid beetle (*Oregus* sp.) was collected from an altitude of c.700 m beside Station Stream. No other notable invertebrates were observed on the property.

Significance of the Invertebrate Fauna

Significant features of the invertebrate fauna are the presence of an unnamed species of grasshopper (previously collected only from the eastern Kirkliston Range) and an unnamed species of carabid beetle (*Oregus* sp.) at the northern end of the property. Invertebrate habitats on higher altitude and stream-side parts of the property are in relatively good condition and support a diverse range of invertebrate species.

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.

Brush-tail possum

Possum sign was observed in rockland habitats throughout the property. Possums are browsers of palatable indigenous plants and predators of birds, lizards and invertebrates. Control may be necessary to effectively protect conservation values on the property.

Rabbits and hares

Hares were observed at higher altitudes on the property, and rabbits were observed at lower-altitudes. Control of these species may be required to protect conservation values on the property.

Stoat

A stoat was observed in the Station Stream area. Control of stoats may be required to protect indigenous fauna on the property.

Wallaby

Wallabies were observed throughout higher-altitude parts of the property. Control of wallabies will be necessary to effectively protect conservation values on the property.

2.7 HISTORIC

2.7.1 European Heritage Values

Caberfeidh Pastoral Lease was formerly part of Hakataramea Run (Run 158), which was granted to Sir William Congreve in 1857. By 1858 George Duncan Lockhart was leasing the property. Lockhart applied for, bought and sold several other properties in the area. He eventually became bankrupt and in 1864 the Hakataramea Run transferred to Dunedin merchants John Douglas and Francis John Alderson. The property was sold in 1867 to Hankey and others. During the 1870s large parts of the Hakataramea Run were freeholded (Pinney, 1971).

Significance of Historic Resources

The rabbit fence that traverses the lower slopes of the property has some historic significance. It is listed as a Category C Heritage Item in the Waimate District Plan. An historic bridle track traverses the southern part of the property

2.8 PUBLIC RECREATION

2.8.1 Physical Characteristics

The property can be divided into two main recreation settings:

Kirkliston Range

This recreation setting covers the higher-altitude parts of the property on the slopes of the Kirkliston Range. The predominant tall tussockland cover and lack of structures in this area provide a relatively natural setting for recreation. An historic bridle track and a vehicle track traverse the southern end of the property, providing access from the Hakataramea Valley to the crest of the Kirkliston Range. This part of the property is clearly visible from public vantage points in the Hakataramea Valley.

The Recreation Opportunity Spectrum for Canterbury Conservancy classifies this setting as Back Country Accessible (Motorised)

Lower Slopes and Valleys

This recreation setting covers the lower-altitude slopes on the property, including the area in the Homestead Block. It is more modified and provides a less natural recreation setting with rural character. It is traversed by a number of vehicle tracks and fences. The Homestead Block contains the homestead and farm buildings.

The Recreation Opportunity Spectrum classification for this setting is Rural.

2.8.2 Legal Access

Roads

Formed legal roads (Milne Road and Farm Road) provide access to the Kirkliston Range part of the property. Access to the Homestead Block is via Middle Road, from Milne Road. Unformed legal roads link Middle Road with the northeast corner of the property at Station Stream and link Farm Road with the southern corner of the property near Farm Stream.

Marginal Strips

No marginal strips are present along streams within the property boundaries.

Adjoining Public Conservation Land

Caberfeidh Pastoral Lease adjoins the Kirkliston Range Conservation Area (Conservation Land Unit I39004) on the upper slopes of the Kirkliston Range along its northwest boundary. A Right of Way up the south-western boundary of the lease from Farm Road provides foot access across the lease.

2.8.3 Activities

Little information was available about the existing recreational use of the property. The vehicle track through the southern part of the property provides access to the southern end of the Kirkliston Range, which provides opportunities for walking, mountain-biking, four-wheel driving, tramping, hunting and possibly ski-touring. Lower-altitude parts of the Kirkliston Range, within the property boundary, provide potential opportunities for walking, mountain-biking, picnicking and nature study. Higher-altitude parts of the property form a backdrop for more passive road-based activities such as scenery viewing, for travellers on Hakataramea Valley Road.

Significance of Recreation

The most significant features of the property for recreation are its position adjacent to a relatively large area of public conservation land on the Kirkliston Range and the presence of an historic bridle track which provides access to the Kirkliston Range. A vehicle track through the property has potential to provide access for public recreation on the Kirkliston 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.

- The water-yield qualities of tall tussocklands on the property should be considered; this may be an important feature of this property.
- There is a risk that freeholded land could be planted in pines, resulting in reduced water yields and wilding tree spread.
- The fence that crosses the lower slopes may be a suitable boundary; this fence appears to separate the summer and winter grazing country.
- There is some four-wheel-drive vehicle use of this property.
- The area provides good horse-riding, mountain-biking and four-wheel-driving opportunities.
- Legal roads that presently end at the property boundary should be extended through any freeholded land to provide access from the Hakataramea Valley to the Kirkliston Range.
- It is important to provide access through the property to conservation land on the Kirkliston Range, perhaps at the northern and southern boundaries of the property.
- The summit of the Kirkliston Range provides interesting country for public recreation.

3.2 DISTRICT PLANS

Caberfeidh Pastoral Lease lies within the Rural Zone of the Waimate District. The Kirkliston Stream catchment above the water supply intake is listed as a Water Supply Protection Area in the district plan. The rabbit fence across the lower slopes of the property is listed as a Category C Heritage Item. The adjoining Kirkliston Range Conservation Area is a Site of Natural Significance in the district plan. There are a number of rules that restrict or control activities in the Rural Zone and in Water Supply Protection Areas. These rules cover activities such as the clearance of indigenous vegetation, tree planting and set-backs from waterways.

3.3 CONSERVATION MANAGEMENT STRATEGIES

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

- To identify, maintain and seek to enhance the natural landscapes and natural landscape values of the Waitaki Unit.
- To identify the significant indigenous vegetation and threatened species of the Waitaki Unit.
- To use a range of effective methods to protect the indigenous biodiversity of the Waitaki Unit.
- To protect and enhance the viability of priority threatened species populations and their habitat(s) in the Waitaki Unit.
- To prevent the loss of natural and landscape values from wilding trees on land managed by the Department.
- To liaise with land managers and regulatory agencies to control and contain wilding trees.

- To reduce and maintain rabbit and thar densities to levels that ensure their adverse effects on natural values are minimised.
- To provide new recreational facilities and opportunities by the Department and other organisations and concessionaires where natural and historic values are not compromised.
- To liaise with adjacent landholders to resolve conflicts over access for recreation to land managed by the Department.
- To increase public awareness of the natural and historic values of the Waitaki.

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 (*).

<u>Common name</u>	<u>Scientific name</u>
alder*	<i>Alnus glutinosa</i>
blue tussock	<i>Poa colensoi</i>
bracken	<i>Pteridium esculentum</i>
broadleaf/kapuka	<i>Griselinia littoralis</i>
brome	<i>Bromus sp.</i>
broom*	<i>Cytisus scoparius</i>
browntop*	<i>Agrostis capillaris</i>
cabbage tree/ti rakau	<i>Cordyline australis</i>
catsear*	<i>Hypochoeris radicata</i>
Chewings fescue*	<i>Festuca rubra</i>
clover*	<i>Trifolium spp.</i>
cocksfoot*	<i>Dactylis glomerata</i>
coral broom	<i>Carmichaelia crassicaule</i>
coral lichen	<i>Cladia retipora</i>
crack willow*	<i>Salix fragilis</i>
creeping pohuehue	<i>Muehlenbeckia axillaris</i>
elderberry*	<i>Sambucus nigra</i>
fescue tussock	<i>Festuca novae-zelandiae</i>
foxglove*	<i>Digitalis purpurea</i>
golden speargrass/taramea	<i>Aciphylla aurea</i>
gooseberry*	<i>Ribes uva-crispa</i>
gorse*	<i>Ulex europaeus</i>
grey willow*	<i>Salix cinerea</i>
harebell	<i>Wahlenbergia albomarginata</i>
hemlock*	<i>Conium maculatum</i>
inaka	<i>Dracophyllum uniflorum</i>
kahikatea	<i>Dacrycarpus dacrydioides</i>
kowhai	<i>Sophora microphylla</i>
lawyer	<i>Rubus schmidelioides</i>
Maori onion	<i>Bulbinella angustifolia</i>
matagouri	<i>Discaria toumatou</i>
matai	<i>Prumnopitys taxifolia</i>
monkey musk*	<i>Mimulus guttatus</i>
mountain flax/wharariki	<i>Phormium cookianum</i>

mountain ribbonwood/houhi	<i>Hoheria lyallii</i>
mountain toatoa	<i>Phyllocladus alpinus</i>
mountain totara.....	<i>Podocarpus hallii</i>
mouse-ear hawkweed*	<i>Hieracium pilosella</i>
narrow-leaved snow-tussock	<i>Chionochloa rigida</i>
native broom.....	<i>Carmichaelia australis/petriei</i>
native violet.....	<i>Viola cunninghamii</i>
nettle*	<i>Urtica</i> sp.
nodding thistle*	<i>Carduus nutans</i>
patotara.....	<i>Leucopogon fraseri</i>
pohuehue	<i>Muehlenbeckia australis</i>
porcupine shrub	<i>Melicytus alpinus</i>
prickly shield fern.....	<i>Polystichum vestitum</i>
pukio.....	<i>Carex secta</i>
red woodrush.....	<i>Luzula rufa</i>
rowan*	<i>Sorbus aucuparia</i>
scrub pohuehue.....	<i>Muehlenbeckia complexa</i>
sheep's sorrel*	<i>Rumex acetosella</i>
short tussock.....	<i>Festuca</i> sp.
silver tussock/wi.....	<i>Poa cita</i>
snow tussock	<i>Chionochloa</i> sp.
speargrass/taramea	<i>Aciphylla</i> sp.
St John's wort*.....	<i>Hypericum perforatum</i>
sweet brier*	<i>Rosa rubiginosa</i>
sweet vernal*	<i>Anthoxanthum odoratum</i>
tall tussock.....	<i>Chionochloa</i> sp.
tauhinu.....	<i>Ozothamnus leptophyllus</i>
thistles*	<i>Cirsium</i> spp.
toetoe	<i>Cortaderia richardii</i>
totara.....	<i>Podocarpus totara</i>
tussock hawkweed*	<i>Hieracium lepidulum</i>
tutu.....	<i>Coriaria sarmentosa</i>
woolly mullein*.....	<i>Verbascum thapsus</i>
Yorkshire fog*	<i>Holcus lanatus</i>

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. Common names for invertebrates are those listed in the Entomological Society of New Zealand's Handbook of New Zealand Insect Names (Scott and Emberson, 1999). 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 (*).

<u>Common name</u>	<u>Scientific name</u>
Australasian harrier/kahu	<i>Circus approximans</i>
Australian magpie*	<i>Gymnorhina tibicen</i>
bat	see South Island long-tailed bat
black-billed gull.....	<i>Larus bulleri</i>
blackbird*	<i>Turdus merula</i>
boulder copper butterfly	<i>Lycaena boldenarum</i>
brown blowfly	<i>Calliphora stygia</i>
brown hare*	<i>Lepus europaeus occidentalis</i>

brown trout*	<i>Salmo trutta</i>
brush-tail possum*	<i>Trichosurus vulpecula</i>
California quail*	<i>Callipepla californica brunnescens</i>
Canterbury galaxias	<i>Galaxias vulgaris</i>
chaffinch*	<i>Fringilla coelebs</i>
Chinook salmon*	<i>Oncorhynchus tshawytscha</i>
chukor*	<i>Alectoris chukar</i>
common skink	<i>Oligosoma nigriplantare polychroma</i>
dunnock*	<i>Prunella modularis</i>
European rabbit*	<i>Oryctolagus cuniculus cuniculus</i>
goldfinch*	<i>Carduelis carduelis</i>
greenfinch*	<i>Carduelis chloris</i>
green skink	<i>Oligosoma chloronoton</i>
grey warbler/riroriro	<i>Gerygone igata</i>
hare*	see brown hare
house sparrow*	<i>Passer domesticus</i>
jewelled gecko	<i>Naultinus gemmeus</i>
koaro	<i>Galaxias brevipinnis</i>
longfin eel	<i>Anguilla dieffenbachii</i>
lowland longjaw galaxias	<i>Galaxias cobitinus</i>
McCann's skink	<i>Oligosoma maccanni</i>
mallard*	<i>Anas platyrhynchos platyrhynchos</i>
marsh crake	<i>Porzana pusilla affinis</i>
New Zealand falcon/karearea	<i>Falco novaeseelandiae</i>
New Zealand grasshopper	<i>Phaulacridium marginale</i>
New Zealand pipit/pihoihoi	<i>Anthus novaeseelandiae novaeseelandiae</i>
paradise shelduck/putakitaki	<i>Tadorna variegata</i>
possum*	see brush-tail possum
rabbit*	see European rabbit
rainbow trout*	<i>Oncorhynchus mykiss</i>
redpoll*	<i>Carduelis flammea</i>
rock pigeon*	<i>Columba livia</i>
short-tailed bat	<i>Mystacina tuberculata</i>
silveryeye	<i>Zosterops lateralis lateralis</i>
skylark*	<i>Alauda arvensis</i>
song thrush*	<i>Turdus philomelos</i>
Southern Alps gecko	<i>Hoplodactylus</i> aff. <i>maculatus</i> "Southern Alps"
southern black-backed gull/karoro	<i>Larus dominicanus dominicanus</i>
southern blue butterfly	<i>Zizina labradus oxleyi</i>
South Island fantail/piwakawaka	<i>Rhipidura fuliginosa fuliginosa</i>
South Island long-tailed bat	<i>Chalinolobus tuberculatus</i>
South Island pied oystercatcher	<i>Haematopus ostralegus finschi</i>
spotted skink	<i>Oligosoma lineoocellatum</i>
starling*	<i>Sturnus vulgaris</i>
stoat*	<i>Mustela erminea</i>
upland bully	<i>Gobiomorphus breviceps</i>
wallaby*	see Bennett's wallaby
welcome swallow	<i>Hirundo tahitica neoxena</i>
yellowhammer*	<i>Emberiza cintrenella</i>

