

Crown Pastoral Land Tenure Review

Lease name : INVERCROY

Lease number : PT 133

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.

August 05

INVERCROY PASTORAL LEASE



CONSERVATION RESOURCES REPORT

Department of Conservation

June 2003

CONTENTS

PART 1:	Introduction	2
PART 2:	Inherent Values.....	3
	2.1 Landscape.....	3
	2.1.1 Landscape Context	3
	2.1.2 Landscape Description	3
	2.1.3 Visual Values	6
	2.2 Landforms and Geology.....	7
	2.3 Climate	7
	2.4 Vegetation	8
	2.4.1 Original Vegetation.....	8
	2.4.2 Indigenous Plant Communities	8
	2.4.3 Notable Flora.....	10
	2.4.4 Problem Plants	10
	2.5 Fauna	11
	2.5.1 Birds and Reptiles	11
	2.5.2 Freshwater Fauna	13
	2.5.3 Invertebrates	14
	2.5.4 Notable Fauna	16
	2.5.5 Problem Animals.....	16
	2.6 Historic Resources	16
	2.7 Public Recreation	16
	2.7.1 Physical Characteristics	16
	2.7.2 Legal Access	17
	2.7.3 Activities	17
PART 3:	Other Relevant Matters and Plans	18
	3.1 Consultation	18
	3.2 District Plans	18
	3.3 Conservation Management Strategies.....	19
PART 4:	Attachments	20
	4.1 Additional Information	20
	4.1.1 Scientific Names of Plant Species.....	20
	4.1.2 References Cited	21
	4.2 Maps	21

PART 1 INTRODUCTION

This report describes the significant inherent values present on Invercroy Pastoral Lease. The information presented in this report is derived from field surveys undertaken during December 2002 and January 2003 and data collated between December 2002 and March 2003. Field survey reports upon which this report is based are listed below.

Invercroy Pastoral Lease covers an area of approximately 2457 hectares. The property lies on the eastern flank of the Kirkliston Range in the Hakataramea Valley, west of the small settlement of Cattle Creek. It adjoins Kirkliston Pastoral Lease to the northwest, Caberfiedh Pastoral Lease to the south, Kirkliston Range Conservation Area to the west, and freehold land in the Hakataramea Valley to the east.

Invercroy Pastoral Lease comprises two blocks connected by a narrow strip at Cattle Creek. The northern block covers the northeast end of the Kirkliston Range, lying between c.580m altitude at Highland Settlement Road and c.1490m at the crest of the range. The southern block covers a narrow strip on the lower eastern flank of the Kirkliston Range, lying between c.700 and c.900m altitude. The property is drained by several small western tributaries of the Hakataramea River.

The property lies on the boundary of the Waitaki and Pareora Ecological Regions: the western part is within Kirkliston Ecological District and the eastern part is within Hakataramea Ecological District. Neither of these ecological districts have been surveyed as part of the Protected Natural Areas Programme, though a management plan was prepared for the adjoining Kirkliston Range Management Area (now the Kirkliston Range Conservation Area) in the 1980s (Goodson *et al*, 1984).

Field survey reports upon which this report is based:

- Invercroy Pastoral Lease, Assessment of Landscape Values, Anne Steven, February 2003. 11p+maps+photographs.
- Invercroy Pastoral Lease Botanical Assessment, Carol Jensen, February 2003, 8p+map+photographs.
- Assessment of the Fauna Values of Invercroy Pastoral Lease, Jane Sedgeley, DOC, December 2002, 6p+map+photographs.
- Invercroy Pastoral Lease, Report on the Aquatic Fauna Surveys, Scott Bowie, February 2003, 9p+map+photographs.
- Invercroy Pastoral Lease, Invertebrates Assessment, Simon J Morris, March 2003, 9p+maps+photographs.

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

2.1 LANDSCAPE

2.1.1 Landscape Context

Invercroy is situated in the Hakataramea Valley, a large inland valley created through block faulting. The valley is characterised by a highly-modified valley floor of farmland (geometric paddocks, shelterbelts, etc), with tussock-covered slopes and scrub-filled gullies on the surrounding mountain ranges. It is one of the lesser known parts of the Canterbury Region: there are no major roads or settlements in the valley, and the ranges are moderately high (1600 to 1900m altitude).

The east side of the Hakataramea Valley was identified as a regionally significant landscape in the Canterbury Regional Landscape Study (Boffa Miskell and Lucas Associates, 1993) because of its position on the approach to Hakataramea Pass: one of two passes that provide an alternative scenic route into the eastern Mackenzie Basin. At a district level the west side of the valley, particularly the Kirkliston Range, is likely to be significant as valued natural landscape (the Waimate District Council has not as yet undertaken a district-wide landscape study).

The Kirkliston Range is a dramatic natural feature. It is not a high range compared to those of the Southern Alps nor particularly rugged, however it is impressive for its length and its simple, broadly-curving structure and even summits, and for the way it rises so abruptly from the valley floor. It has a cover of reasonably dense tall tussock and is studded with rock outcrops. It provides the visual backdrop to views across the valley from Hakataramea Valley Road. The adjacent downlands are notable for the long parallel ridges and gently-shelving piedmont fans which run southeast from the range for several kilometres and form a broad apron to the range.

The rangelands portion of Invercroy Pastoral Lease is the only part of the property that is significant in the context of the wider Hakataramea Valley landscape. The upper slopes and summit of the Kirkliston Range are the most important parts. The lower slopes are highly modified though are an integral part of the range-face, and the transition from unimproved tall tussock to modified grassland is not so obvious from the road. The range landscape also forms an important scenic corridor for recreation activities in the Stony Creek basin.

2.1.2 Landscape Description

Most of Invercroy Pastoral Lease is on the eastern side of the Kirkliston Range, between Station Stream and the end of Gormans Road. This side of the range is relatively steep and deeply dissected by numerous small gullies separated by angular to narrowly rounded spurs. Fluvial and mass-movement processes have been dominant in shaping the land. Deep colluvium mantles the range slopes, resulting in faces of smooth planar form, broken by the occasional rock outcrop with an apron of angular blocky talus.

Although bare ground is present, the range is generally well vegetated right to the summit; scree is mostly absent on the Invercroy part of the range. Cirque glaciation did occur in the highest eastern basins above 1400m and peri-glacial and freeze-thaw processes have left their mark, especially on the range summit where stone patterning is characteristic.

The basin floor comprises gently-angled fans and rolling downlands, underlain by a mix of weathered piedmont deposits, outwash gravels and alluvial deposits, mainly related to the earliest two of the seven glacial periods identified in the Waitaki Valley. Recent alluvial deposits are limited to the narrow beds of small streams that dissect the area.

At the broadest level, Invercroy Pastoral Lease straddles two regional landscape types: the rangelands are within the Semi-Arid Ranges Landscape Type; and, the valley floor is within the Low Altitude Plains Landscape Type (Boffa Miskell and Lucas Associates, 1993). At a district level the property lies within the self-contained landscape of the Hakataramea Valley.

For the purposes of this landscape assessment (pastoral lease tenure review) Invercroy Pastoral Lease is divided into four landscape units. These units are illustrated on the Landscape Unit Map on the following page, and are described below.

Landscape Unit 1, South Kirkliston Range

This landscape unit comprises the eight kilometre-long narrow ribbon of the property between the rabbit-proof fence at the base of the range and the 914m contour, and between Cattle Creek in the middle of the property and Station Stream at the southern end of the property. The area thus comprises the lowest spurs and faces of the Kirkliston Range and the uppermost sections of the basin downlands, mainly in the vicinity of the larger streams (Station, Poplar and McKays). It also includes a small area of low, dissected, hilly terrain just south of Cattle Creek, forming the landscape sub-unit of Small McKays Hills.

Dense vegetation covers the area: extensive, dense, even-aged matagouri¹ scrub is dominant, with a mix of sparse short tussock and exotic pasture in the open spaces. Species of *Olearia*, *Coprosma*, *Muehlenbeckia*, native broom and speargrass are common and Maori onion and *Carex-Schoenus* wetlands are also present. The area is divided into four grazing blocks and traversed by a four-wheel-drive track. Some areas of scrub have been sprayed with herbicide, creating linear and geometric patterns.

The South Kirkliston Landscape Unit can be subdivided into two sub-units:

McKays-Poplar Creek Blocks: The main range slopes and adjacent downlands.

Small McKays Hills: The small area of lower hilly terrain just south of Cattle Creek.

Landscape Unit 2, North Kirkliston Range

This landscape unit comprises part of the northern section of the Kirkliston Range north of Cattle Creek. This section of range faces northeast and rises to c.1500m altitude (compared to the main southern part of the range which rises to c.1800m). The whole of this flank of the range from crest to base lies within the property.

Tall tussock covers the mid to upper slopes of this unit. Vegetation on the lower slopes is similar to that in Landscape Unit 1, although tall tussock is more common. The unit is divided into three grazing blocks. Four-wheel-drive tracks traverse the lower slopes, the crest of the range, and the main side-ridge just north of Cattle Creek.

¹ Scientific names of species are listed in Section 4.1.1

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The North Kirkliston Landscape Unit can be divided into three sub-units:

Range Summit: The range has a broad sweeping summit characterised by open tall tussock; areas of sparse short tussock interspersed with mat and cushion plants, including extensive *Hieracium*; sub alpine cushion bog; fellfield; and, rockland and stonefield (rock tors, rock pavements, stone polygons and stone drains). Small shrubs are present among the rock outcrops and the rocks are frequently coated with pink/red and dark grey lichens, indicating long-term stability.

Mid and Upper Range Slopes: The range slopes are steep and dissected, with snow tussock cover varying from tall and dense on cooler moister aspects to open and stunted on sunnier aspects. The slopes are studded with rock outcrops and associated patches of talus.

Improved Lower Slopes: The lower slopes have been over-sown and top-dressed and support more intensive grazing than the upper slopes. Vegetation is varied, comprising dense matagouri with *Muehlenbeckia*, native broom and *Olearia* shrubland interspersed with remnant snow tussock (often tall and robust), short tussock, speargrass and exotic pasture species. The gentle spurs and parts of the basin floor are also included in this sub-unit. A few willows are present along one of the larger streams.

Landscape Unit 3, Cattle Creek Downlands

This landscape unit comprises the low rolling and gently-sloping downlands of the basin floor, north of Cattle Creek. This gentle topography, lying roughly between 600 and 700m, has been extensively modified and supports a cover of exotic pasture with some short tussock *Carex-Schoenus* wetland and matagouri scrub.

The shallow bouldery bed of Cattle Creek cuts close to the south edge of this area, becoming more entrenched with steep angular risers where it passes through Landscape Unit 4. The unit is divided into several large geometric paddocks. A four-wheel-drive track and airstrip are present on the south side of Cattle Creek, parallel to the property boundary.

Landscape Unit 4, Developed Downlands

This landscape unit comprises the part of the downlands that has been completely developed. It consists of a number of cultivated paddocks, some bordered by coniferous shelterbelts. The stockyards, homestead and other farm buildings are located within this landscape unit.

2.1.3 Visual Values

The range slopes within Invercroy Pastoral Lease are highly visible from Hakataramea Valley Road. The full length of the Kirkliston Range is visible from this road in an ever-changing perspective, enclosing the valley and forming a scenic backdrop. Views, although impressive, are at a distance of around seven to ten kilometres. The mid to upper slopes (above the pastoral lease boundary) are the focus of attention. The Kirkliston Range Crown Land Management Plan identified the whole of the Kirkliston Range as important backdrop scenery (Goodson *et al*, 1984).

Similar, closer views can be gained from parts of other local roads in the valley such as Homestead Road, Highland Farm Settlement Road and Gormans Road. Direct views are gained from Gormans Road, which comes within one kilometre of the property boundary at the base of the range. Views from two to three kilometres can be gained from Highland Farm Settlement Road in the vicinity of the Invercroy homestead.

The less-modified rangeland areas, especially the summit area of the northern section, have high aesthetic value, typical of high country tussockland. The summit area shares the special landscape character of block-faulted mountain tops (broad open rolling crests, fascinating rock outcrops and stone patterns, and rockland vegetation). The snow tussock cover is generally robust and forms a moderately dense cover. Accordingly it provides the special visual qualities associated with expanses of healthy grassland. There are excellent panoramic views of the Mackenzie Basin and the Hakataramea Valley from viewpoints on the summit ridge.

The lower developed country has low inherent visual value.

2.2 LANDFORMS AND GEOLOGY

Invercroy Pastoral Lease covers the lower east, and low- to mid-northeast, slopes of the Kirkliston Range: a block-faulted range characteristic of the South Canterbury-North Otago high country. Two main landform and substrate types are separated by the north-south trending Kirkliston Fault at the base of the range. West of the fault, the Kirkliston Range comprises moderately-indurated greywacke and argillite of the Torlesse Group (Triassic-Permian). All but the steeper slopes of the range are mantled with colluvium and loess. East of the fault, the lower altitude parts of the property on the floor of the Hakataramea Valley comprise deposits of glacial outwash gravel and recent alluvium (Goodson *et al*, 1984).

Landforms result primarily from fluvial erosion of the range slopes, though landforms of glacial or peri-glacial origin are present high on the crest of the range. Range slopes are mostly steep, though much of the property covers the gentler toe slopes of the range. The adjoining Hakataramea Valley has relatively gentle rolling terrain, dissected by small streams. The property covers a portion of this gentle country north of Cattle Creek.

Invercroy Pastoral Lease ranges in altitude from c.580m on the valley floor to c.1490m on the range crest. It is drained by small tributaries of the Hakataramea River, including parts of Cattle Creek and Gorman, Rocky Point, McKays, Poplar and Deadman streams.

Soils on the property are predominantly high country yellow-brown earths: Kaikoura steepland soils occur on shady faces above c.1050m; Benmore steepland soils occur on drier slopes between 1050 and 1250m; and, Kirkliston soils occur on rolling ridges between 1000 and 1300m (Goodson *et al*, 1984). At lower altitudes, Tengawai and Hakataramea yellow-grey earths are present, and Eyre Papparua soils are present on the recent alluvial plains.

2.3 CLIMATE

The climate of the Kirkliston Range-Hakataramea Valley area is characterized by warm dry summers and cold winters. Predominant winds are from the northwest and are frequently strong and drying. Annual rainfall on the lower northeast flank of the Kirkliston Range is c.700mm, rising to over 1000mm on the range crest (Goodson *et al*, 1984). Most precipitation occurs from south to southeast winds, including winter snow which may lie on the upper slopes of the range for several months. High temperature fluctuations are characteristic: frosts can occur at any time of the year and can be severe at higher altitudes.

2.4 VEGETATION

2.4.1 Original Vegetation

McEwen (1987) described the former (pre-European) vegetation of the Hakataramea and Kirkliston ecological districts as extensive narrow-leaved snow-tussock at montane and sub-alpine 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 tussocks (*Chionochloa* species) were generally confined to higher-altitude sites.

It appears likely that most low-altitude (below 900m) parts of Invercroy Pastoral Lease formerly supported short tussock grassland (dominated by *Festuca* and *Poa* species) and scrub, with areas of shrubland and scrub along stream sides, and perhaps scattered patches of ti 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 tussock, cushionfield, rockland and stonefield, similar to the vegetation present today.

2.4.2 Indigenous Plant Communities

The present-day vegetation of Invercroy Pastoral Lease is mainly snow tussockland with short tussockland and matagouri shrubland on the gentler lower slopes. Most of the property below about 800m altitude has been developed for pastoral farming and now supports a modified cover of matagouri, short tussock, exotic grasses and clovers. Induced matagouri shrublands extend along the lower slopes where over-sowing and top-dressing has occurred. Some more natural shrublands are present along streams and gullies. Above c.800m short tussock and matagouri grade into snow tussock that extends up slope to the ridge crest.

The main plant communities on the property are described below.

Forest

There are no areas of indigenous forest on the property. There are pine shelterbelts and exotic trees on the flats, willow trees along some streams and scattered wilding pines on montane slopes. Mountain totara is present just outside the lease on the adjacent conservation area in Cattle Creek and in a tributary of Poplar Stream. There are also several groups of kowhai trees associated with *Coprosma propinqua* shrublands in a tributary of Cattle Creek, including several large trees and young saplings of varying height. A solitary kowhai tree is present on the slopes above a tributary of Gorman Stream, and a single small broadleaf tree is present amongst shrubland in the sheltered gorge of McKays Stream.

Shrubland

Shrublands dominated by matagouri are common on the top-dressed lower slopes below approximately 800m. Other native species often present in these shrublands include *Coprosma propinqua*, *Carmichaelia petriei*, *Melicytus alpinus*, *Olearia odorata*, *Olearia bullata*, *Coprosma rugosa*, *Muehlenbeckia complexa* and bush lawyer. *Clematis marata* is occasionally present.

Ground cover in grassy clearings throughout these shrublands is dominated by silver tussock, fescue tussock and exotic grasses, including sweet vernal, browntop, cocksfoot and bromes (*Bromus* spp.). Exotic herbs present include thistles, woolly mullein, haresfoot trefoil and mouse-ear hawkweed.

The best areas of shrubland are on the banks and terraces of the small streams; these are representative of the more extensive shrublands that were originally present. A tributary of Poplar Stream is a typical example with all the above shrubs present as well as occasional *Dracophyllum uniflorum*, mountain flax and tutu.

On the lower northeast slopes near the vehicle track are several clusters of *Coprosma intertexta*. Other shrubs growing nearby include matagouri, *Olearia bullata*, *Coprosma propinqua* and occasionally *Olearia odorata* and coral broom. Bracken is occasionally present amongst the matagouri. Grassy clearings in these shrublands contain silver tussock, narrow-leaved snow-tussock and fescue tussock. Mouse-ear hawkweed and sweet vernal are also present.

Prominent rock outcrops provide protection for a diverse range of native herbs and shrubs. Typically present are coral broom, dwarf broom, *Pimelea traversii*, and *Gaultheria crassa*. Other species occasionally present include *Brachyglottis haastii*, *Leucopogon fraseri*, *Wahlenbergia albomarginata*, *Leptinella pectinata*, golden spaniard, *Raoulia subsericea*, *Celmisia angustifolia*, *Celmisia gracilentia*, *Helichrysum bellidioides* and *Blechnum pennamarina*. Blue tussock, fescue tussock, bristle tussock, narrow-leaved snow-tussock and mouse-ear hawkweed are also present.

Short tussock/exotic grassland

Most lower-altitude areas (below c.800m) have been developed for pastoral farming and have a high component of introduced grasses, clovers and herbs. On the lower slopes and in clearings amongst matagouri shrubland are fescue tussock, silver tussock and introduced grasses including cocksfoot, sweet vernal, browntop, Yorkshire fog and various bromes (*Bromus* spp.). Woolly mullein and thistle species are common beside vehicle tracks.

Snow tussock grassland

Above approximately 800m short tussock grassland and matagouri scrub merge into snow tussock grassland. More than 50% of the pastoral lease area is dominated by snow tussock grassland. The steep slopes generally support a good cover of narrow-leaved snow-tussock with slim snow-tussock at the higher and colder sites. Common inter-tussock species at 1000m include fescue tussock, blue tussock, *Leucopogon fraseri*, *Celmisia gracilentia*, golden spaniard, *Coprosma propinqua*, matagouri and occasionally coral broom. Adventives sweet vernal, browntop, Yorkshire fog and mouse-ear hawkweed are commonly present. White clover is occasionally present on lower slopes.

Higher up on the broad summit ridge at 1300m a diverse range of predominantly native species are present in slim snow-tussockland, including golden spaniard, *Celmisia gracilentia*, *Celmisia lyallii*, *Celmisia densiflora*, *Raoulia subsericea*, blue tussock and, near rock outcrops and boulders, *Aciphylla montana* var. *gracilis*, *Myrsine nummularia*, *Melicytus alpinus*, *Craspedia incana*, *Hebe buchananii*, *Cardamine bilobata*, *Kelleria dieffenbachii*, *Leucopogon colensoi* and *Hierochloa* sp. Gentle debris slopes support small populations of *Ranunculus crithmifolius*.

At the highest point on the property slim snow-tussock is dominant. Inter-tussock species include *Phyllachne colensoi*, *Raoulia grandiflora*, *Raoulia subsericea*, *Lycopodium fastigiatum*, *Celmisia sessiliflora*, *Celmisia lyallii*, *Kelleria dieffenbachii*, *Scleranthus uniflorus*, *Gentiana*

sp. and occasional king devil hawkweed. Small rock outcrops nearby support similar species with the addition of snowberry, *Brachyglottis bellidioides*, *Brachyglottis haastii*, *Aciphylla montana* var. *gracilis*, *Dracophyllum muscoides*, blue tussock, *Leucopogon fraseri*, *Celmisia densiflora* and the occasional small mat of mouse-ear hawkweed.

Along the steep slopes below the vehicle track there are considerable areas of stony or rocky ground (40%) with slim snow-tussock providing 50% cover and native inter-tussock species a further 10% cover. Dwarf broom is common on these slopes. Other inter-tussock species present include *Pentachondra pumila*, *Myrsine nummularia*, *Gaultheria crassa*, *Leucopogon colensoi* and occasional coral broom.

Wetland

On the broad summit plateau cushion bogs occupy depressions on the gentle snow tussock slope. These bogs support mounds of *Oreobolus pectinatus* surrounded by pools of water. Other species present on the raised hummocks include *Gnaphalium laterale*, *Psychrophila obtusa*, *Celmisia alpina*, *Carex gaudichaudiana* and *Ranunculus gracilipes*. A band of *Schoenus pauciflorus* surrounds the bogs with slim snow-tussock on the well-drained slopes beyond. These bogs are the only natural wetlands on the property. They are in good condition with little stock damage and few exotic species.

2.4.3 Notable Flora

The following species listed by Hitchmough (2002) have been recorded from the property.

Table 1 Notable plant species recorded from Invercroy Pastoral Lease, January 2003.

Plant Species	Known Distribution on Property
Gradual Decline	
<i>Carmichaelia crassicaule</i>	Near rock outcrops in tussockland
<i>Carmichaelia vexillata</i>	Scattered in tussockland
Sparse	
<i>Clematis marata</i>	Scattered in <i>Coprosma</i> /matagouri shrubland
<i>Coprosma intertexta</i>	In shrubland at northern end of property
<i>Olearia bullata</i>	In <i>Coprosma</i> /matagouri shrubland
Range Restricted	
<i>Aciphylla montana</i> var. <i>gracilis</i>	In tussockland on higher-altitude slopes

2.4.4 Problem Plants

Introduced plants that may have a significant 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.

Wilding pines (conifer species)

Scattered wilding pines on montane slopes at the northern end of the property were removed by DOC in April 2003. Continued monitoring and control will be required to prevent the re-establishment of wilding pines on these slopes.

2.5 FAUNA

2.5.1 Birds and Reptiles

A total of 18 bird species were recorded on Invercroy Pastoral Lease: seven indigenous (two endemic and five native) and 11 introduced (Tables 2 and 3). Two other species (eastern falcon and kea) may also be present. None of the birds observed on the property are classified as threatened species. Three lizard species (common gecko, common skink and McCann’s skink), all endemic, were recorded on the property. High numbers of these lizard species were observed, though none are classified as threatened species.

Shrubland and scattered trees in sheltered gullies and along streams provide the most important habitats for indigenous bird species on the property. Rock outcrops, talus and shrubland provide the most important habitats for lizards on the property. Birds and lizards recorded in these habitats are described for two representative areas below.

McKays Stream

McKays Stream runs through the southern section of the property and is the second largest stream on the property after Cattle Creek. Reasonably large areas of native shrubland dominated by matagouri occur on the valley floor and lower hill-slopes. The hill-slopes have numerous rock outcrops and areas of talus and boulderfield.

Birds

Australasian harrier, New Zealand pipit, southern black-backed gull and welcome swallow were present, and grey warbler and silvereve were recorded in indigenous shrubland.

Lizards

Eight common skinks (*Oligosoma nigriplantare polychroma*) and one common gecko (*Hoplodactylus* aff. *maculatus* “Southern Alps”) were recorded among small rocks at the toe of a hill on the true right of the stream. This habitat included matagouri, *Comprosmia* sp, and bush lawyer. One McCann’s skink (*O. maccanni*) and numerous common skinks were also recorded on a ridge where the stream divides. The habitat here was dominated by short tussock and snow tussock with some golden spaniard.

Other species

A weta was found under a rock at the second site. Three dead possums were observed in the shrubland.

Uplands in northern section of the property

The uplands are characterised by numerous rock outcrops and areas of rock pavement. Several *Oreobolus* bogs are present just inside the northwest boundary of the property.

Birds

Southern black-backed gull, paradise shelduck and New Zealand pipit were recorded.

Lizards

Three rock outcrops and one area of rock pavement on the northwest boundary of the property were examined closely for lizards. Five common skinks and one common gecko were recorded at one site dominated by rock outcrops and tussockland with some *Celmisia*, *Pimelia*, snowberry, and coral broom. Two other sites sampled had larger areas of rock outcrop and pavements of shattered rocks with gentians, *Anisotome* sp., and *Craspedia* sp. A total of 20 common skinks, one McCann’s skink, and one common gecko were observed at these two

sites. In addition, a large skink was observed, but not identified, by the team botanist. One common gecko was observed at another rock outcrop in snow tussock close to the property boundary. High numbers of common/McCann’s skinks were observed while walking along a three to four kilometre route down a main spur of the range.

Table 2 Indigenous bird species recorded from Invercroy Pastoral Lease, January 2003.

Bird species		Known Distribution on Property
Common name	Scientific name	
paradise shelduck	<i>Tadorna variegata</i>	throughout
Australasian harrier	<i>Circus approximans</i>	throughout
black-backed gull	<i>Larus dominicanus</i>	throughout
welcome swallow	<i>Hirundo tahitica</i>	throughout
grey warbler	<i>Gerygone igata</i>	throughout
silveryeye	<i>Zosterops lateralis</i>	indigenous shrubland
New Zealand pipit	<i>Anthus novaeseelandiae</i>	uplands

Table 3 Introduced bird species recorded from Invercroy Pastoral Lease, January 2003.

Bird species	
Common name	Scientific name
skylark	<i>Alauda arvensis</i>
song thrush	<i>Turdus philomelos</i>
blackbird	<i>T. merula</i>
starling	<i>Sturnus vulgaris</i>
house sparrow	<i>Passer domesticus</i>
chaffinch	<i>Fringilla coelebs</i>
redpoll	<i>Carduelis flammea</i>
goldfinch	<i>C. carduelis</i>
greenfinch	<i>C. chloris</i>
yellowhammer	<i>Emberiza cintrenella</i>
Australian magpie	<i>Gymnorhina tibicen</i>

2.5.2 Freshwater Fauna

Freshwater fauna communities were surveyed at ten sites on Invercroy Pastoral Lease spread along tributaries of the Hakataramea River. Four different fish species, including three native species, and a wide range of aquatic macro-invertebrates, including insect larvae, crustaceans, molluscs and worms, were observed on the property.

Five different aquatic habitat types are described. These are classified by water source, resistance to drying, and surrounding landform structure. Of these, four are flowing-water habitats and one is a still-water habitat. Native fish were found in most habitat types, except for the alpine wetlands. However, where brown trout were found, few native fish were present. The large streams contained the most distinctive and diverse macro-invertebrate habitat on the property.

One of the distinguishing features of the Hakataramea River is that it is the only large tributary of the Waitaki River that is not directly 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.

Freshwater fish species previously recorded (in the New Zealand Freshwater Fish Database) in the Hakataramea River are: longfin eel (*Anguilla dieffenbachii*), koaro (*Galaxias brevipinnis*), Canterbury galaxias (*Galaxias vulgaris*), lowland longjaw galaxias (*Galaxias cobitinis*), common bully (*Gobiomorphus cotidianus*), upland bully (*Gobiomorphus breviceps*), torrentfish (*Cheimarrichthys fosteri*), brown trout (*Salmo trutta*), rainbow trout (*Oncorhynchus mykiss*), chinook salmon (*Oncorhynchus tshawytscha*) and brook char (*Salvelinus fontinalis*). Of these, longfin eel and lowland longjaw galaxias are listed as threatened by Hitchmough (2002).

Habitat Types

The five habitat types associated with freshwater communities on Invercroy Pastoral Lease are described below:

Small Streams

Small streams are the most common habitat type on the property but, due to their small size, were not surveyed. They are generally ephemeral in appearance, although all were flowing at the time of the field survey. All were generally less than 50cm in width, with very few pools, but with a constant seepage along the stream bed. Small streams are present along the toe slope of the Kirkliston Range.

Large Streams

Large streams were the most common fishable habitat type observed on the property. Most are wider than one metre, and all are spread along the toe slopes of the Kirkliston Range.

Rivers

The lower reach of Cattle Creek is the only river on the property. It is much wider and carries more water than the large streams. This river habitat runs from the top boundary to the bottom boundary of the property. The upper part of Cattle Creek, in the gazing licence area beyond the property boundary, was also surveyed.

Water Races

A water race runs from Cattle Creek near the airstrip, cutting across the vehicle track and flowing onto adjoining land. Water flow was consistent along the length of the water race at

the time of the field survey: generally one metre wide and about 400mm deep. The water race is accessible to stock along its entire length.

Alpine Wetlands

Two main alpine wetlands are present, both on the ridge crest at the northern end of the property. These wetlands are of considerable size (≥ 0.25 hectares) and are not linked to other freshwater habitats.

Fish

Small streams were not fished due to the low water levels. It is unlikely that they provide suitable habitat for fish, as most have culverts and water flows appear low. The large streams were all surveyed and a number of fish species observed. The streams generally fell into two categories based on fish fauna: those with and those without brown trout. In most large streams where brown trout were present the native species were either present in very small numbers or not at all, with the exception of one stream near the northern boundary of the property where Canterbury galaxias were common. In the large streams where brown trout were absent, Canterbury galaxias were present in high numbers. Also present in one large un-named stream in the northern section of the property were upland bully and longfin eel, although the Canterbury galaxias and upland bully in this stream appeared unhealthy with traces of white spot common.

The river, Cattle Creek, contained brown trout, with some upland bully in the lower reaches. The brown trout were much larger than those observed in the large streams. The water race was not surveyed, but this habitat appears suitable for only small brown trout and bullies. The alpine wetlands were not surveyed but appear unlikely to contain any fish species, as they are not linked to other freshwater habitats.

2.5.3 Invertebrates

Invertebrates were sampled from three main habitats on Invercroy Pastoral Lease: sub-alpine, shrubland/grassland, and aquatic/wetland. Two notable invertebrate species were observed: the grasshopper *Brachaspis* “Hunter”, and an un-named species of grasshopper that has been recorded only from the Kirkliston Range. High altitude areas comprise the most important invertebrate habitats on the property, notably cushion bogs on the crest of the range. Invertebrate communities on the property are described below for each of the main habitats sampled.

Sub-alpine

Two species of alpine grasshopper (Acrididae) are present in the sub-alpine zone between 900 and 1500m: *Sigauss australis* and *Brachaspis* “Hunter”. Several alpine black cicada (*Maoricicada*) were heard singing from areas of bare rock. Numerous species of moth were observed in different habitats within the sub-alpine zone. Some moth species were observed only on rocky areas, some from the ridgelines, and others from the tussockland or from the alpine cushion bog and shrubland. Tussock butterflies (*Argyrophenaga*) were observed flying over the tussockland.

Shrubland/Grassland

Diverse shrublands on the southern part of the property support a rich collection of native invertebrates. The leaf litter is in good condition and provides excellent habitat for ground-

dwelling invertebrates, including species of cockroach (Blattidae), ground beetle (Carabidae), darkling beetle (Tenebrionidae), weevil (Curculionidae), springtail (Arthropleona), centipede (Chilopoda) and millipede (Diplopoda). Foliage-dwelling invertebrates observed included species of spider (Araneae), ichneumon wasp (Ichneumonidae) and long-footed fly (Dolichopodidae). The abundance of *Olearia* shrubs is likely to provide habitat for a rich moth fauna (Patrick, 2000). Tiger beetles (*Neocicindela* sp.) were observed hunting or sunbathing on small clay banks alongside the shrubland.

Small areas of open grassland are present within the shrublands. Species of grasshopper, blue blowfly (*Calliphora quadrimaculata*), brown blowfly (*Calliphora stygia*), cockroach, ant, wasp and bee (Hymenoptera), moth and butterfly (Lepidoptera) were all observed in good numbers. Also observed throughout the property were tussock ringlet butterfly (*Argyrophenaga* sp.), red admiral butterfly (*Bassaris gonerilla gonerilla*), southern blue butterfly (*Zizina otis oxleyi*) and numerous species of copper butterfly (*Lycaena* spp.). Two species of grasshopper were collected from open grassland around the shrubland: the common grasshopper (*Phaulacridium marginale*) and a new species of *Siga* that has been recorded only from the Kirkliston Range.

A few diurnal moths were observed on the warmer days though conditions were not ideal (these species are very seasonal and fly mainly between October and December). The diurnal moth *Asaphodes clarata* was observed flying over grassland. Pastures around the homestead and along Cattle Creek are modified and support only common insects.

Several large rocky outcrops at the northern end of the property provide excellent habitat for species of weta (Anostomatidae), cockroach, ground beetle, darkling beetle and weevil.

Aquatic/Wetland

The major streams on the property appear in good condition and provide a variety of habitats (runs, riffles and pools) and substrates (medium/large stones and fine/coarse gravel). Aquatic insects present in streams and creeks with a gravel substrate include species of caddisfly (Trichoptera), mayfly (Ephemeroptera) and dobsonfly (Megaloptera). Species of fly (Diptera) and beetle (Coleoptera) were present in ponds or slower flowing water. Four species of Odonata were observed on the property: mountain giant dragonfly/kapowai (*Uropetala chiltoni*), blue damselfly/keekeewai (*Austrolestes colenonis*), red damselfly/kihitara (*Xanthocnemis zealandica*) and yellow spotted dragonfly (*Procordulia grayi*).

A large alpine cushion bog system on the range crest at the northern end of the property has very high significant inherent values. It appears to be the only alpine cushion bog on this part of the Kirkliston Range. A diverse crane fly (Tipulidae) and diurnal moth and butterfly fauna was observed on the cushion plants. Pockets of free water support species of beetle, weevil and waterboatman (*Sigara* sp.). Species of native bee (Apidae), fly and wasp (Hymenoptera) were seen in large numbers. The grasshopper *Siga australis* was recorded around the bog margin and the diurnal moth *Orocrambus scoparioides* was collected on the cushion bog, representing the northern limit for this moth species.

2.5.4 Notable Fauna

The following species listed by Hitchmough (2002) were either observed on the property or there is habitat on the property likely to contain the species.

Table 4 Threatened fauna

Animal Species		Known Distribution on Property
Common name	Scientific name	
Nationally Critical		
lowland longjaw galaxias	<i>Galaxias cobitinis</i>	present in Hakataramea River system
Nationally Endangered		
kea	<i>Nestor notabilis</i>	possibly present on Kirkliston Range
Gradual Decline		
eastern falcon	<i>Falco novaeseelandiae</i>	likely to be present
longfin eel	<i>Anguilla dieffenbachii</i>	present in ‘large stream’ habitats
Range Restricted		
grasshopper	<i>Brachaspis</i> “Hunter”	sub-alpine habitats

2.5.5 Problem Animals

Red deer and wallaby have been noted on the Kirkliston Range and chamois are likely to be present. Possums were observed in low-altitude shrubland and rabbits and hares observed in grasslands. Control of populations of these species may be necessary to protect areas set aside as public conservation land. Such control should occur as part of wild animal control activities in the adjoining Kirkliston Range Conservation Area.

2.6 HISTORIC RESOURCES

The land presently within Invercroy Pastoral Lease appears to have originally been part of the large Hakataramea Run (Run 158) that was taken up for grazing in 1857 (Pinney, 1971). Run 158 was transferred to the Canterbury and Otago Association Ltd in 1869 and then 40,000 acres of the lease was transferred from the Association in 1889.

The only known historic feature on the property is the rabbit-proof fence that runs along a substantial part of the property boundary at the foot of the Kirkliston Range. This fence is part of a 67 kilometre rabbit fence constructed between the Tekapo River and Hakataramea Valley in 1888. This fence did not achieve its original purpose but was so well-constructed that it survives today in several places, including on Invercroy Pastoral Lease (Whelan, 1989).

2.7 PUBLIC RECREATION

2.7.1 Physical Characteristics

Invercroy is on the eastern face of the Kirkliston Range. The northern part of the lease rises fairly steeply from the valley floor to the top of the Range. This part of the lease has modified tussock grasslands at a lower level with relatively unmodified tussock grasslands above. The topography is characterised by moderately steep slopes and small basin systems dropping off a flat range crest.

The southern part of the lease is a narrow strip along the foot of the range. It is characterised by moderately steep slopes and some incised streams cutting down from the Conservation Area above. Most of this area is modified tussock grasslands and shrublands.

2.7.2 Legal Access

Legal access is provided to the lease and the homestead via Highland Farm Settlement Road which leaves the Hakataramea Valley Road near Cattle Creek.

An unformed legal road follows the southern boundary of the middle part of the lease from Highland Settlement Road and, in conjunction with an easement, gives legal access to the Kirkliston Range Conservation Area near Cattle Creek.

An unformed legal road also crosses freehold land from Gormans Road to give access to the northern part of the lease.

2.7.3 Activities

The 4wd track skirting the northern section of the lease has been used occasionally for 4wd trips, horseriding and walking. Hunters have also sometimes crossed the lease to gain access to the Range.

PART 3 OTHER RELEVANT MATTERS AND PLANS

3.1 CONSULTATION

Early-warning consultation meetings were held in Timaru on the 10th September 2002 and in Christchurch on the 11th December 2002. Representatives of the following organisations were present at these meetings: NZ Four Wheel Drive Association; Canterbury Four Wheel Drive Association; Canterbury University Tramping Club; Canterbury Botanical Society; Peninsula Tramping Club; NZ Deerstalkers Association; Federated Farmers High Country Committee; Public Access NZ; South Canterbury Tramping Club; Temuka Tramping Club; and, Federated Mountain Clubs of NZ.

Issues raised by representatives included:

- The 914m contour line boundary is not fenced.
- There is an easement across the property which links public conservation land to a legal road. It would be desirable to define this as a right of way under section 60 of the Land Act for ‘foot access’ only.
- It would be highly desirable to set aside public conservation land along the range crest to enable traverses for tramping in summer and skiing in winter.
- It would be desirable to secure access from Gormans Road to the Kirkliston Range Conservation Area, possibly by utilising the legal road and the existing track that goes into the area.
- A range-crest plateau supports unique Otago plants and typical Otago habitat. Four-wheel-drive vehicles need to be diverted away from that area. Vehicle access could be provided to the lower slopes, with parking, so that people can walk from there to the range crest.
- The rock and mineral clubs are keen on collecting from the range. They want to be able to collect approximately 2kg of rock per person per day, providing the holes are filled in.

3.2 DISTRICT PLANS

Invercroy Pastoral Lease lies within the Rural S (Rural Scenic) Zone of the Waitaki District. The Rural Scenic Zone contains areas which have significant scenic values: the high country; rangelands; and, inland basins. The majority of this zone lies above the 400m contour. The proposed Waitaki District Plan was publicly notified in December 1996. Following public submissions and hearings the district plan, as amended by council decisions, was released in September 1999. The plan establishes what type of activities are Permitted, Controlled, Discretionary or Non-complying. The plan also establishes Site Development Standards and Critical Zone Standards for these activities. A permitted or controlled activity that does not comply with any one or more of the Site Development Standards becomes a restricted discretionary activity. However, the Plan has undergone a number of changes in the Rural Scenic Zone following Council’s decisions on submissions, and a number of matters are still to be resolved.

3.3 CONSERVATION MANAGEMENT STRATEGIES

Invercroy Pastoral Lease is within the Waitaki Unit of the Canterbury Conservation Management Strategy (CMS). Key priorities for this unit are listed as:

- To identify, maintain and seek to enhance the natural landscape values of the unit through appropriate methods such as tenure review and district plans.
- To identify the significant native vegetation and threatened species of the unit and to use a range of effective methods to protect a representative range of indigenous biodiversity of the unit as well as protecting and enhancing the viability of priority threatened species populations and their habitats.
- To provide new recreational facilities and opportunities by the Department and other organisations and concessionaires where natural and historic resources and cultural values are not compromised, and to liaise with adjacent landholders to resolve conflicts over access for recreation to land managed by the Department.
- To reduce and maintain rabbit and tahr densities to levels that ensure adverse effects on natural values are minimised.

Other conservancy-wide priorities identified in the CMS that are relevant to tenure review on the property are to undertake necessary actions to secure the conservation of category A and B species, including predator control, fencing and habitat protection. The species listed as priority include *Carmichaelia curta*, the robust grasshopper, scree skink, long-toed skink, black-fronted tern and banded dotterel.

PART 4 ATTACHMENTS

4.1 ADDITIONAL INFORMATION

4.1.1 Scientific Names of Plant Species Cited in the Text

Common name..... Scientific name

(* = naturalised species)

blue tussock	<i>Poa colensoi</i>
bracken.....	<i>Pteridium esculentum</i>
bristle tussock	<i>Rytidosperma setifolium</i>
broadleaf	<i>Griselinia littoralis</i>
bromes*	<i>Bromus</i> spp.
browntop*	<i>Agrostis tenuis</i>
bush lawyer.....	<i>Rubus schmidelioides</i>
clovers*.....	<i>Trifolium</i> spp.
cocksfoot*.....	<i>Dactylis glomerata</i>
coral broom.....	<i>Carmichaelia crassicaule</i>
dwarf broom	<i>Carmichaelia vexillata</i>
fescue tussock	<i>Festuca</i> sp.
golden spaniard.....	<i>Aciphylla aurea</i>
haresfoot trefoil*.....	<i>Trifolium arvense</i>
king devil*	<i>Hieracium praealtum</i>
kowhai	<i>Sophora microphylla</i>
Maori onion	<i>Bulbinella angustifolia</i>
matagouri	<i>Discaria toumatou</i>
mountain flax	<i>Phormium cookianum</i>
mountain ribbonwood.....	<i>Hoheria lyallii</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</i> sp.
short tussock	<i>Festuca</i> and <i>Poa</i> spp.
silver tussock	<i>Poa cita</i>
slim snow-tussock.....	<i>Chionochloa macra</i>
snowberry	<i>Gaultheria depressa</i> var. <i>novae-zelandiae</i>
speargrass.....	<i>Aciphylla</i> sp.
sweet vernal*	<i>Anthoxanthum odoratum</i>
tall tussock	<i>Chionochloa</i> spp.
thistles*	<i>Cirsium</i> spp.
ti tree	<i>Cordyline australis</i>
tutu	<i>Coriaria sarmentosa</i>
white clover*	<i>Trifolium repens</i>
willow*	<i>Salix</i> spp.
woolly mullein*	<i>Verbascum thapsus</i>
Yorkshire fog*	<i>Holcus lanatus</i>

4.1.2 References Cited

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4.2 ILLUSTRATIVE MAPS

4.2.1 Topographical/Cadastral Map

4.2.2 Values Map