

## **Crown Pastoral Land Tenure Review**

**Lease name : MANUKA POINT**

**Lease number : PC 053**

## **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.

**October**

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# **MANUKA POINT PASTORAL LEASE**



## **CONSERVATION RESOURCES REPORT**

**DEPARTMENT OF CONSERVATION**

**SEPTEMBER 2006**

## TABLE OF CONTENTS

<b>PART 1</b>	<b>INTRODUCTION</b>	<b>3</b>
	Map Topo/Cadastral	5
<b>PART 2</b>	<b>INHERENT VALUES</b>	<b>6</b>
	2.1 Landscape	6
	2.1.1 Landscape Context	6
	2.1.2 Landscape Description	6
	2.1.3 Visual Values	9
	Map Landscape Units and Values	11
	2.2 Geology, Landforms and Soils	12
	2.2.1 Geology	12
	2.2.2 Landforms	12
	2.2.3 Soils	12
	2.3 Climate	12
	2.4 Land Environments of New Zealand (LENZ)	13
	Map Lenz Threat Categories	14
	2.5 Vegetation	15
	2.5.1 Ecological Context	15
	2.5.2 Vegetation and Flora	15
	Map Botanical Values	22
	2.5.3 Problem Plants	23
	2.6 Fauna	24
	2.6.1 Bats	24
	2.6.2 Birds	24
	2.6.3 Lizards	27
	Map Bird and Lizard Values	29
	2.6.4 Freshwater Fauna (fish and invertebrates)	30
	Map Aquatic Values	33
	2.6.5 Terrestrial Invertebrates	34
	Map Invertebrate Values	37
	2.6.6 Problem Animals	38
	2.7 Historic	39
	2.7.1 European Heritage Values	39
	2.8 Public Recreation	40
	2.8.1 Physical Characteristics	40
	2.8.2 Legal Access	40
	2.8.3 Activities	41

<b>PART 3</b>	<b>OTHER RELEVANT MATTERS AND PLANS</b>	<b>42</b>
3.1	Consultation	42
3.2	District Plans	42
3.3	Conservation Management Strategies	42
3.4	New Zealand Biodiversity Strategy	43
<b>PART 4</b>	<b>ATTACHMENTS</b>	<b>44</b>
4.1	Additional Information	44
4.1.1	Scientific Names of Species	44
4.1.2	References Cited	48

## PART 1 INTRODUCTION

Manuka Point Pastoral Lease is leased by Manuka Point Station Company Limited. The 2744 ha property is located at the east end of the Ragged Range, at the confluence of the Rakaia and Mathias rivers in mid Canterbury. It covers moderately-steep to steep slopes on the northeast flank of the Ragged Range in the Mathias Valley and an area of flat to gently-sloping valley floor at the base of the south slopes of the Ragged Range in the Rakaia Valley. The property ranges in altitude from 500 m at the confluence of the Rakaia and Mathias rivers to approximately 1650 m on the upper northeast slopes of the Ragged Range.

The northern part of the property is drained by the Mathias River and its tributaries, notably Big Paddock Creek, Hut Stream and Jerusalem Stream. The southern part of the property on the floor of the Rakaia Valley is drained by the Rakaia River and the lower reaches of a number of small tributaries of the Rakaia River (Jellicoe Stream and Rocky Spur, Twin, Broad and Big Fan creeks). The Mathias River flows into the Rakaia River. Access to the property is from State Highway 72 near the Rakaia Gorge, via Blackford Road and then Double Hill Run Road to the south bank of the Rakaia River. Access to the property from there is via a roughly formed and unstable four-wheel-drive vehicle track across the two kilometre-wide bed of the Rakaia River.

Most parts of Manuka Point Pastoral Lease lie in the Mathias Ecological District (ED), within Heron Ecological Region (McEwen, 1987). A small northern part of the property (north of Jerusalem Stream) lies in Browning ED, within D'Archiac Ecological Region. The Mathias ED was surveyed in the late 1980s as part of the Protected Natural Areas Programme. One area on the fan of Twin Creek (Mathias RAP 12) was recommended for protection by that survey (Arand and Glenny, 1990). The south slopes of the Ragged Range adjacent to the property (Mathias RAP 10) were also recommended for protection. The beds of the Rakaia and Mathias rivers adjacent to the property are listed as Significant Sites of Wildlife Interest (SSWI) and a Wetland of Ecological and Representative Importance (WERI). There is a National Water Conservation (Rakaia River) Order 1988. This order declares that the Rakaia River and its tributaries include and provide for; an outstanding natural characteristic in the form of a braided river, outstanding wildlife habitat above and below the Rakaia River Gorge, outstanding fisheries and outstanding recreational angling and jet boating features. The order also includes various provisions to preserve and protect the Rakaia River and its tributaries.

The property adjoins Mt Algidus Pastoral Lease across the Mathias River (UCL) to the northeast, Double Hill, Glenfalloch and Upper Lake Heron pastoral leases across the Rakaia River (UCL) to the south, Rakaia Forest Conservation Area (Conservation Land Unit J35002) on the south slopes of the Ragged Range and north of the property in the upper Mathias Valley, Manuka Point Retirement Area (J34003) on the upper slopes of the Ragged Range, Rangitata-Rakaia Headwaters Conservation Area (J35001) to the west, and part of the small Rakaia Riverbed Martello Cliffs Conservation Area (K35001) on the valley floor east of the property. There is a section of freehold land and Crown Land (under action) at the base of the point.

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

- Manuka Point Pastoral Lease Landscape Assessment, Alan Petrie, November 2005, 7p + photos + map.
- Manuka Point Vegetation Report, Mark Davis, March 2006, 19p + maps.

- Assessment of the Fauna Values of Manuka Point Pastoral Lease, Simon Elkington, *undated*, 21p + maps.
- Manuka Point Pastoral Lease, A Report on the Aquatic Fauna Surveys, Scott Bowie, April 2006, 14p including photos + maps.
- Invertebrate Assessment of Manuka Point Pastoral Lease, Simon Morris, March 2006, 17p + photos + maps.

Additional land areas to the Pastoral Lease were included for consideration of tenure review after the conservation resources survey was completed. These areas are the southern boundary of the Rakaia Forest Conservation Area (J35002) and part of Rakaia Forest Conservation Area (J35002) in the Mathias River. The reason for this land being included is to resolve a boundary issue associated with a Land Improvement Agreement and the partial surrender of land. The natural values of the post survey included land have been extrapolated from the values identified in the earlier survey.

Insert Topographical map here

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

### **2.1 LANDSCAPE**

#### **2.1.1 Landscape Context**

Manuka Point Pastoral Lease occupies the eastern end of the Ragged Range, at the confluence of the Rakaia and Mathias rivers. The Ragged Range branches out from the main divide of the Southern Alps/Ka Tiritiri O Te Moana and features a chain of high pyramid-shaped peaks flanked by straight-sided slopes regularly dissected by deep valleys and gorges. South and east of the property are the expansive beds of the Rakaia and Mathias rivers, spanning several kilometres and isolating the property from formed roads. The property is basically triangular in shape and contains two main structural components: the rectilinear slopes of the high peaks and the expansive alluvial outwash that abuts these slopes.

In a wider context the Canterbury Regional Landscape Study (Boffa Miskell Limited and Lucas Associates, 1993) identified the upper Rakaia Valley and its main tributaries (including the Mathias Valley) as a regionally outstanding landscape, mainly due to its sheer scale, sense of drama and foreboding qualities. The isolated location of Manuka Point Pastoral Lease hides it from most surrounding public viewpoints, helping to reinforce its overall sense of remoteness and wilderness.

#### **2.1.2 Landscape Description**

For the purposes of this landscape assessment Manuka Point Pastoral Lease is divided into four landscape units, principally based on landform. 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, Rakaia Valley**

This unit incorporates the river flats and terraces on the southern side of the property. It is elongated in form and is bounded to the north by a relatively straight line that generally follows the lower edge of the forested hill slopes. The corresponding southern boundary is an indistinguishable line crossing the river flats. Small fans spread across the flats at regular intervals, carrying streams flowing from rocky gorges adjacent to the property, including Jellicoe Stream and Big Fan, Broad, Twin and Rocky Spur creeks. Opposite Jellicoe Stream there is an extensive alluvial terrace that tilts slightly towards the Rakaia River.



The ground cover is predominately short modified grassland, with fescue tussock and occasional silver tussock. A notable feature is the absence of woody weeds. Over the more shallow soils and along abandoned stream channels, matagouri shrubland is abundant. These shrublands are a significant feature, with many of the older shrubs probably well over 100 years old. Interspersed amongst the shrublands are large swards of short grassland. In the east, close to the homestead and farm buildings, the river flats have been subdivided into a number of small grazing blocks, whereas further west (up-valley) the blocks are relatively large. Close to the property boundary, near Jellicoe Stream, there is a well-maintained hut.

#### Landscape Values

This unit has high inherent landscape values attributable to the legibility of the formative processes that have created the upper Rakaia Valley. The river flats contrast markedly with the abutting rectilinear side slopes of the Ragged Range; this juxtaposition of distinctive landforms is a memorable feature of the unit. The overall sense of spaciousness due to the absence of intervening landforms is another feature of the unit, which contributes to the awe-inspiring scenic views, particularly towards the Arrowsmith Range. The combination of the short grassland and the even-stature thorny matagouri shrubland provides the landscape with savannah-like qualities especially during the summer months when the grassland sward tends to dry off.

#### Potential Vulnerability to Change

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

- Depletion of matagouri shrubland, especially by mechanical mowing or spraying.
- Further intensification and subdivision of the extensive short grassland.
- Erection of structures that would compromise the existing uncluttered qualities.
- Upgrading of the tracks that would impinge on the overall naturalness of the grasslands.

### **Unit 2, Lower Mathias Valley**

This unit includes the northeast slopes of the Ragged Range between the first large incised stream and the confluence of the Mathias and Rakaia rivers, and including the long narrow eastern ridge of the Ragged Range and the isolated islands between the two rivers at the base of this ridge. The mountain slopes within this unit are moderately steep and regularly broken by small indentations and straight runnels draining directly to the Mathias River. Upper slopes have stable scree and small protrusions of base rock.

The vegetation in this unit has been extensively modified with a large proportion covered in grassland and regenerating shrubland. Shrubland is more extensive along the edges of the deep gullies, across the steeper slopes and at the toe of the slopes. Access to the unit is via a formed track that follows the base of the slopes. A large proportion of the area has been fenced as a deer paddock. The two discrete parcels of land at the eastern corner of the property are mostly covered in modified grassland, with native shrubland at the edges of the more elevated terrace.

#### Landscape Values

This unit conveys moderate inherent landscape values primarily due to the extent to which the slopes have been converted to grassland. The evidence of human intervention is widely apparent with the recent modification of the regenerating shrubland. This unit is representative of an area that forms a transition from a developed to a more natural landscape.

#### Potential Vulnerability to Change

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

- Prevention of the natural regeneration of indigenous shrubland and forest.

### **Unit 3, Mid Mathias Valley**

This unit encompasses the central segment of the northeast slopes of the Ragged Range in the Mathias Valley. The upper limits of the unit follow the series of high peaks, including Manuka Peak (1686 m). The lower boundary of the unit is the prominent contact between the mountain slopes and the expansive bed of the Mathias River. The upper slopes feature extensive natural weathering in the form of stable scree, eroding chutes and large areas of exposed base rock. The craggy spurs of the high peaks descend to the mid slopes where typically the disjointed landforms are replaced by a suite of truncated benches and hummocky terrain. Draining out of the largest gullies are substantial streams, including Big Paddock Creek.

The vegetative cover generally conveys a disjointed pattern; a consequence of previous fires and early pastoralism. Above approximately 1200 m tall tussockland is present on the more stable sites, while the balance of the alpine zone is largely bare ground. The mid slopes are mostly clad in a mixture of modified fescue tussock grassland and shrubland. A distinctive sunny bench, commonly known as Manuka Park, is covered in exotic grassland. Protected by fire, the deep gullies are lined with beech forest supplemented by broadleaf, lancewood, mountain ribbonwood, mountain holly and three finger. The lower side slopes are clad in successional shrubland and widespread fernland.

#### Landscape Values

This unit has high inherent landscape values, as it is dominated by a series of high peaks and spurs that are fundamental components of the Mathias Valley. The angular and fractured landforms have been hewn out by weathering and glacial activity. These formative processes are legible in the shattered rock-covered peaks, sheets of stable scree, eroding chutes and craggy bluffs. The complex vegetative cover provides this unit with coarse textural qualities that complement the rugged landform. Within this context the cultural overlay (e.g. modified grassland) is subservient to the inherent elements. The unit conveys a sense of remoteness and solitude, as the only track is the rough vehicle track up the bed of the Mathias River.

#### Potential Vulnerability to Change

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

- Prevention of the regeneration of shrubland to forest.
- Changes of land use that could result in distinctive changes in the composition of the vegetation.
- Inappropriate siting of structures on prominent peaks and natural features that would compromise the existing outstanding wilderness qualities of the valley.
- Establishment of a formed access track up the Mathias River valley that would result in the reduction of the existing wilderness qualities.

### **Unit 4, Upper Mathias Valley**

This unit covers all of the northern mountainous section of the property. Its upper boundary crosses both the Hut Stream and Jerusalem Stream valleys and extends along the prominent Long Spur to about the 1600 m contour. The crest of the distinctive spur that leads down from high point 1779 m defines the eastern boundary. The lower boundary to the unit (and property) follows the toe of the mountain slopes.

The two large valleys of Hut and Jerusalem streams are etched deeply into the Ragged Range. The origin of the streams (beyond the property boundary) is a series of cirque basins, some of which contain permanent snow and ice. Beneath the head basins the streams are constricted within V-shaped valleys that feature straight-sided slopes clothed in scree and narrow eroding runnels. The two streams drain out to the Mathias River via narrow rocky gorges. Vegetative cover is an incoherent mixture of tall tussockland at high altitudes, and shrubland, short tussockland and fernland at mid and lower altitudes. Patches of forest are present on the steeper slopes and within

the rocky gorges. Access to the upper Mathias River valley is principally by a rough vehicle track in the riverbed. There are two huts in the upper valley beyond the property boundary.

#### Landscape Values

This unit conveys high inherent landscape values and complements the natural values described for Landscape Unit 3, including:

- The complexity of ground cover that ranges from sheets of scree, prominent rock outcrops, vestiges of tall tussock and patches of beech forest.
- The austere and rugged characteristics contained within this unit help to augment the wider Ragged Range.
- The acute contrast in colour and texture of the ground covers create distinctive landscape patterns.
- The overall sense of isolation and wilderness created by the lack of formed access.

A notable feature of the unit is the detectable change in direction of the Mathias Valley opposite the prominent spur beside Hut Stream. This change in direction helps to reinforce the overall sense of portentousness that the valley portrays.

#### Potential Vulnerability to Change

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

- Inappropriate siting of structures on prominent peaks and natural features that would compromise the existing wilderness qualities of the valley.
- Prevention of the regeneration of shrubland to forest.
- Establishment of formed vehicle tracks into the upper sections of the Mathias Valley.

### **2.1.3 Visual Values**

A large proportion of Manuka Point Pastoral Lease is hidden from public vantage points. Both the inherent natural characteristics of the upper Rakaia Valley and the alignment of Double Hill Road limit views of the river flats (Landscape Unit 1). A commanding view of the river flats can be observed from the high terraces on Glenfalloch Pastoral Lease, directly opposite the property on the other side of the Rakaia River. The true scale of the river flats and their spatial qualities can only be realized from the air or surrounding mountains.

The absence of formed roads in the Mathias Valley results in landscape units 2, 3 and 4 having lower visual resource values. This visual inaccessibility helps to strengthen the perception of isolation and solitude within the valley. These “hidden landscape” traits are also described in the 1993 Regional Landscape Study, which refers to the foreboding qualities of the upper Rakaia Valley and its main tributaries such as the Mathias Valley.

#### **Significance of Landscape Values**

Manuka Point Pastoral Lease makes a significant contribution to the landscape character of the upper Rakaia Valley and its major tributaries. Features that make this property significant in a landscape context are its wide altitudinal range and contrasting landforms.

In more specific terms, the significant features on the property include the Rakaia River flats (Landscape Unit 1) which form an important component of the valley. The natural character of the river flats is augmented by the matagouri shrublands, which act as a natural transition between the large beds of gravel and the grasslands.

Contrasting markedly with the near-two dimensional qualities of the river flats are the constant steep slopes that overlook the Mathias Valley, especially within the mid and upper sections of the property (landscape units 3 and 4). The austere and fractured qualities that epitomize the Ragged Range are captured within these two units. The steep-sided slopes create a strong visual edge that helps give the valley a sense of enclosure and remoteness. These wilderness qualities are strengthened by the absence of any formed roads and structures.

The lower eastern end of the property (Landscape Unit 2) is less significant in a landscape context owing to the more moderate pitch of the slopes and the extent to which the natural character has been compromised by modification of the original vegetation.

Insert Landscape Units and Values map

## **2.2 GEOLOGY, LANDFORMS AND SOILS**

### **2.2.1 Geology**

The basement rocks of the Ragged Range are uniform graded-bedded greywacke and argillite of the Torlesse Group (Chlorite Subzone I), with scattered inter-bedded volcanics. Gentler hill slopes have deposits of loess (wind-deposited sediments). The valley floors of the Rakaia and Mathias rivers comprise recently-deposited river gravel, sand, silt and fan gravels (Warren, 1967). There is a New Zealand Fossil Record (J34/f23) of buried charcoal, dated at  $538 \pm 33$  years before present, from the Mathias Valley faces within the major stream south of Hut Stream, NZ Map Grid (J34) 2360900, 5773599 (Arand and Glenny, 1990).

### **2.2.2 Landforms**

Manuka Point Pastoral Lease is dominated by the steep slopes of the Ragged Range and the relatively extensive gentle beds of the Rakaia and Mathias rivers. The mountain slopes are glacially-smoothed and dissected by deeply-incised rocky gullies. Upper slopes of the Ragged Range are generally steeper with extensive areas of exposed rock, and are contiguous with the high rugged mountains of the main divide of the Southern Alps. The long eastern ridge of Manuka Peak sloping evenly to the confluence of the Rakaia and Mathias rivers is a prominent feature. The wide gravel beds of the Rakaia and Mathias valleys are impressive landforms. The braided river channels, extensive stable river flats and smaller terraces and fans at the valley edges combine to create a distinct landform which contrasts markedly with the adjoining steep mountain slopes. The mountain ranges and the wide valleys are typical of the extensively-glaciated central Southern Alps.

### **2.2.3 Soils**

Higher altitude parts of the property on the Ragged Range have Bealey steepland soils, with smaller areas of Katrine hill soils on the lower northeast slopes. Lower-altitude parts of the property on the floors of the Rakaia and Mathias valleys have Tasman sandy loams.

### **Significance of Geology, Landforms and Soils**

The mountain ranges and wide valleys are typical of the extensively-glaciated central Southern Alps. The rugged glaciated mountains on and around the property, the long eastern ridge of Manuka Peak and the wide open valleys of the Rakaia and Mathias valleys are significant landform features. There is a New Zealand Fossil Record site on the Mathias faces.

## **2.3 CLIMATE**

Manuka Point Pastoral Lease has a high-rainfall mountain climate with cold winters and warm summers (Tomlinson, 1976). The climate of the area is strongly influenced by the proximity of the main divide of the Southern Alps. Predominant winds are from the northwest, with occasional gales. Snow can affect all parts of the property and lie at higher altitudes for several weeks in winter. Average annual precipitation is over 1000 mm (Arand and Glenny, 1990).

## 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, this 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 One) has become the recognised benchmark for the promotion of threatened LENZ conservation.

Table One      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

A small area beside the homestead is “acutely-threatened”. Acutely-threatened land environments are those in which less than 10% of the original indigenous vegetation remains. Most other areas of valley floor and small areas within the fenced deer paddock are “at risk”. At risk land environments are those in which between 20% and 30% of the original vegetation remains.

### Significance of Land Environments

Most lower-altitude parts of Manuka Point Pastoral Lease on the floor of the Rakaia Valley are classified as “at risk”.

**Insert Lenz map here**



## 2.5 VEGETATION

### 2.5.1 Ecological Context

Manuka Point Pastoral Lease is within the Mathias Ecological District (Heron Ecological Region), except for mountain slopes northwest of Jerusalem Stream which are in Browning ED (D'Archiac ER). The Mathias-Mt Hutt Protected Natural Areas Programme report identified one Recommended Area for Protection on the property: RAP 12 at Twin Creek fan (Arand and Glenny, 1990). It represents the diversity of plant communities occurring on fans including seral riverbed plants on active gravels, mountain totara-mountain totoa forest on stable older surfaces and matagouri shrubland. The lower mountain slopes of RAP 10 (South Ragged Range) adjoin the Rakaia Valley part of the property and support mountain beech, mountain totara-broadleaf and mixed hardwood forests (Arand and Glenny, 1990).

The property lies between the largely-protected high mountain ranges of the central Southern Alps and the more modified mountains and valleys of the grazed (mostly pastoral lease) high country to the east. The steep mountains and upper valleys in the high-rainfall zone to the west support largely intact mossfield, cushionfield and stonefield plant communities on valley floors; forest, scrub and shrubland-tussockland communities on montane slopes; and shrubland, tussockland, herbfield, stonefield and rockland communities on alpine summits.

Burrows (1977) and Molloy (1983) outline the ecological importance of plant communities in the Rakaia and Mathias valleys, especially the less modified plant communities in the upper valleys. A notable feature of the vegetation in this area is the local southern limit of continuous mountain beech forest and, correspondingly, the local northern limit of podocarp-hardwood forest (Arand and Glenny, 1990). A transition between these forest types occurs adjacent to the property on the southern slopes of the Ragged Range between Big Fan Creek and Broad Creek. The presence of matai in this forest only c.200 m from the property boundary (Harding, 1998) is significant, as matai is rare in the ecological district (Arand and Glenny, 1990) and largely absent from inland Canterbury (Wilson, 1991). Based on a study of the vegetation history of a site on Prospect Hill, only two kilometres distant from the property across the Rakaia River, Burrows and Russell (1990) identifies climate change, pre-human fires and the post-glacial transgression of beech forest as important influences on the distribution of forest in this area.

The original vegetation of the Mathias Valley area of the property would have been dominated by shrubland, tall tussockland, stonefield and rockland above the treeline, and mountain beech forest and podocarp-hardwood forest on montane slopes. Rockland and stonefield (scree) vegetation were (and still are) present on steep and/or unstable slopes. The original vegetation of the Rakaia Valley part of the property would have been low-stature mountain totara-hardwood forest on older fan surfaces, and matagouri shrubland, fescue tussockland, herbfield and mossfield on recent river terraces and fans. Sedgeland, rushland and cushionfield would have been present in wetlands and seepages (Arand and Glenny, 1990).

### 2.5.2 Vegetation and Flora

The vegetation of the property is dominated by matagouri shrubland on river terraces and fans, with exotic grassland and short tussock grassland occupying open areas and the ground beneath the shrublands. Recent gravels support lichens, mosses, and early colonising plants. Small patches of grey shrubland and mountain totara-broadleaf forest occur on some older fan surfaces, and small bog rush wetlands occur on river flats. Regenerating broadleaf-hardwood forests, kanuka/manuka scrub and mountain beech remnants occur on mid to low mountain slopes, with short tussock grasslands and exotic grasslands towards the confluence of the Rakaia and Mathias rivers. Higher slopes support mixed shrubland, tussockland, herbfield, scree and rockland communities. Small wetlands

are associated with moraine terraces. The vegetation is described below for the two main parts of the property. The naturalness of plant communities is rated low, medium or high.

### Rakaia River Valley flats

The vegetation of the Rakaia River flats is dominated by extensive matagouri shrubland and short tussock grassland. Stream fans support early colonising plants on active gravels, with matagouri and mixed shrubland on older surfaces, and patches of mountain totara-broadleaf forest. Bog rush wetlands are found in depressions and adjacent to some streams. The flats closest to the homestead (east of Big Fan Creek) have more exotic grassland and less matagouri.

Matagouri shrubland is more extensive and taller towards the western end of the property. It is mostly c.2-3 m tall and occasionally 6 m tall, depending on the terrace age and perhaps the incidence of fire. Very few other shrub species are present, with only occasional turpentine shrub, kanuka, manuka, tauhinu and sweet brier. Several small patches of gorse have been sprayed near the homestead. The naturalness of these communities is usually medium. At the western end of the property, matagouri is up to 3 m tall and has a cover of 20-30%. The ground tier is dominated by creeping pohuehue, Chewings fescue, browntop, woolly moss and sweet vernal, while other prominent plants include patotara, mouse-ear hawkweed, harebell, common pennywort, *Acaena inermis*, *A. caesiiglauca*, *Helichrysum filicaule*, red woodrush, *Pimelea oreophila* and sheep's sorrel. Sheep tracks are numerous and dung is widespread. Indigenous species are more common on drier stony areas, particularly mosses, lichens, scabweed and creeping pohuehue. In eastern areas the grasslands are similar but *Pernettya macrostigma* and feathery tutu are also common. There is much less matagouri (<5%) and it is more grassy with silver tussock and some fescue tussock. Naturalness in these areas is low to low/medium. *Aciphylla subflabellata* (threat status: sparse) is present with bog rush next to two streams in this area.

An isolated area of matagouri occurs on a terrace at the confluence of the Rakaia and Mathias rivers. Dominant plants here are woolly moss, Chewings fescue, matagouri (5-10%), browntop and sweet vernal. Ground tier species are similar to those found elsewhere, and the matagouri is generally below 0.5 m high. Naturalness is low-medium.

Beyond its presence among matagouri shrubland, exotic grassland is concentrated on the flats near the homestead and on a fan between Jellicoe Stream and Rocky Spur Creek. Woody vegetation has all but been removed from this fan except for a little scattered matagouri, one mountain totara and some scrub at its northeast margin. The grassland is dominated by Chewings fescue, with browntop, mouse-ear hawkweed, fescue tussock (5-10%), mosses and patotara. Other species include sweet vernal, little hard fern, creeping pohuehue, *Helichrysum filicaule*, blue wheatgrass, red woodrush, catsear, blue tussock, *Pimelea oreophila*, harebell, *Rytidosperma unarede?* and *Gonocarpus aggregatus*. Naturalness is low-medium. Small turf areas occur next to down-cut ephemeral streams in some grassland areas. Turf plants include mosses, *Nertera* sp., *Coprosma atropurpurea?*, *Leptinella pusilla*, *Hydrocotyle microphylla*, *Epilobium komarovianum*, *Stackhousia minima*, *Mazus radicans*, *Carex breviculmis*, *Euchiton laterale?*, *Ranunculus multiscapus*, catsear, mouse-ear hawkweed, browntop and sweet vernal.

The heads of fans are composed of gravel, with colonising plants appearing as stability increases downstream. The older surfaces of Jellicoe Stream fan support scabweed, mosses, lichens, haresfoot trefoil, sweet vernal, *Epilobium melanocaulon*, sandwort, *Poa lindsayi*, white clover, browntop, *Geranium sessiliflorum*, purging flax, *Scleranthus uniflorus* and scattered silver tussock. Sheep tracks, trampling and dung are widespread and naturalness is low/medium to medium. The lower fan of Twin Creek has a vegetation cover of 20-25% and a similar range of plant species, with the addition of Chewings fescue, silvery hair grass, oxeye daisy, sheep's sorrel, woolly mullein, mouse-ear chickweed, creeping pohuehue, harebell, *Euchiton luteo-album*, *Raoulia haastii*, *R. glabra*, tumble grass and *Parahebe decora*. Exotic species are not prominent and sheep dung is scattered

through the area. Naturalness is medium to medium/high. A band of silver tussock on the fan margins merges into extensive matagouri on the Rakaia River terraces.

Mixed shrubland also occurs on fans and adjacent to small areas of mountain totara-broadleaf scrub or forest. Species in these shrublands include matagouri, kanuka, mingimingi, korokio, mountain wineberry, mountain totara, kowhai, mountain holly, lawyer, scrub pohuehue, prickly shield fern, kohuhu and occasional mountain toatoa and *Coprosma wallii* (threat status: gradual decline). Shrubland adjoining mountain toe slopes contains matagouri, *Coprosma rugosa*, *C. tayloriae*, mingimingi, mountain holly, prickly shield fern, mountain kiokio, little hard fern, red woodrush, native violet, common pennywort, *Uncinia divaricata* and exotic grasses. Naturalness is medium.

Small areas of mountain totara-broadleaf forest and scrub occur on some stable fans and terrace risers. At Twin Creek the forest has a partly closed canopy. The main species here are mountain totara (with 50 cm diameter trunks), broadleaf, lancewood, kowhai and manuka. The ground tier supports *Acaena* sp., *Lagenifera petiolata*, *Uncinia clavata*, prickly shield fern, little hard fern, mountain kiokio, grasses, tussock hawkweed, mosses and wall lettuce. Open areas and forest margins support korokio, mingimingi, matagouri, lancewood, mountain toatoa, mountain wineberry, mountain totara, kanuka, yellowwood, mountain holly and lawyer. Overall naturalness is medium/high with abundant regeneration in the forest and potential for the spread of woody plants onto adjacent fan surfaces. The scrub on the fan west of Rocky Spur Creek supports mountain totara (common and up to 8 m tall). Other species include lancewood, weeping mapou, mountain wineberry, *Coprosma rigida*, *C. ciliata*, *C. wallii*, korokio, broadleaf, mountain ribbonwood, scrub pohuehue, native jasmine, lawyer, *Clematis marata* and pohuehue. The ground surface supports prickly shield fern, mosses, little hard fern, *Mazus radicans*, *Acaena* sp., tussock hawkweed, sweet vernal, *Carex colensoi*?, creeping buttercup, common pennywort and Yorkshire fog. Seedlings of mountain totara, korokio and *Coprosma* are scattered through the area and naturalness is medium to medium/high. Matagouri around the margins is up to 4 m high, and some have trunk diameters up to 25 cm.

Wetlands are restricted to the margins of small streams, the base of fans and depressions among the matagouri shrubland. They are dominated by bog rush, *Hydrocotyle tripartita*, jointed rush and mosses, with other plants such as exotic grasses, common pennywort, rautahi, soft rush, *Carex breviculmis*, *Acaena inermis*, fescue tussock and silver tussock. *Carex kaloides* and spike sedge are also present.

A small island occurs at the confluence of the Rakaia and Mathias rivers. The top of the island is dominated by exotic grasses, red clover and white clover, while sweet vernal, fescue tussock, silver tussock and matagouri are also prominent. Naturalness is low. The scarps support patchy shrubland of matagouri, mingimingi, tutu, porcupine shrub, mountain akeake, koromiko, manuka, bracken, prickly shield fern, native broom, lawyer, exotic grasses, Californian thistle, red clover, tussock hawkweed and occasional sweet brier. Naturalness on the scarps is low/medium. The nearby Rabbit Island has additional species such as kowhai, mountain ribbonwood and broadleaf.

### **Mathias Valley mountain slopes**

Higher slopes above the treeline support rockland, scree, herbfield, tussockland and shrubland. Wetlands are largely restricted to seepages and bogs on moraine terraces. Mid to lower slopes are dominated by kanuka, manuka, regenerating broadleaf-hardwood forest, mountain beech forest, short tussock grassland and exotic grassland in the lower valley (particularly in the fenced deer paddock).

Upper slopes at the northwest end of the property support diverse herbfield induced from the burning of midribbed snow-tussock, which now has a cover of less than 5%. The herbfield is dominated by *Celmisia discolor*, *C. sessiliflora*, mosses, snowberry, mountain clubmoss, bristle tussock, *Anisotome flexuosa* and snow-patch grass. Other plants include alpine rush, snow daisy, lichens,

*Coprosma perpusilla*, *Kelleria dieffenbachii*, blue tussock, onion-leaved orchid, *Psychrophila novae-zelandiae*, *Celmisia petiolata*, *C. angustifolia*, *C. haastii*, *C. spectabilis*, little hard fern, *Phyllachne colensoi*, everlasting daisy and scattered midribbed snow-tussock. There are few exotic species and naturalness is high.

Coarse screes support little hard fern, everlasting daisy, bristle tussock, prickly shield fern, avalanche grass, turpentine shrub, *Hebe subalpina*, *Pratia macrodon*, blue tussock, porcupine shrub, golden speargrass, mountain clubmoss, edelweiss, snow totara and thousand-leaved fern. Animal tracks are common and there is localised browsing damage. Naturalness is medium/high to high. Rocky talus east of Hut Stream supports a shrubland of *Coprosma rugosa*, tauhinu, *Gaultheria crassa*, mountain flax, turpentine shrub, porcupine shrub, mountain kiokio and golden speargrass. Other species include little hard fern, blue tussock, thousand-leaved fern, mountain oat grass, native violet, mosses, lichens, creeping pohuehue, *Celmisia coriacea*, avalanche grass, sweet vernal, tussock hawkweed, catsear and mouse-ear hawkweed. The mountain flax is severely browsed. Naturalness is medium to high.

Glacially-smoothed rock outcrops on mid slopes near Hut Stream support extensive snow totara and turpentine shrub. Other species include mosses, lichens, bristle tussock, edelweiss, *Pentachondra pumila*, *Gaultheria crassa*, creeping mapou, *Brachyglottis haastii*, patotara, snowberry, tauhinu, cotton daisy, inaka, *Anisotome flexuosa*, red woodrush, woolly moss, golden speargrass, midribbed snow-tussock, *Coprosma* aff. *pseudocuneata*, *Helichrysum intermedium*, porcupine shrub and harebell. Few exotic plants are present and naturalness is high.

Bog rush seepages occur on some upper slopes, and bogs occur in hollows behind moraine terraces. East of Hut Stream the bogs are dominated by red tussock, bog rush and sphagnum moss. Other species include turpentine shrub, inaka, tauhinu, *Hebe pauciramosa*, snowberry, *Anisotome aromatica*, little hard fern, *Pratia angulata* agg., wire moss, soft rush, *Forstera sedifolia*, *Coprosma cheesemani*, tussock hawkweed, *Microtis oligantha*, comb sedge, *Carex gaudichaudiana*, *Wahlenbergia pygmaea* and *Lagenifera petiolata*. Naturalness is high. Seepages extend over the terrace and are dominated by red tussock, mosses, turpentine shrub, inaka, tauhinu, bog pine, mountain toatoa and manuka. Naturalness is again high. Below the seepages is a small tarn alongside the beech forest. Shallow water is occupied by *Myriophyllum propinquum* and spike sedge, while adjacent silty ground is occupied by *Carex gaudichaudiana*, *Hydrocotyle tripartita* and bladderwort. Soft rush and marsh thistle are scattered around the tarn edges and on a raised rib extending across the tarn. Beyond the terrace edges red tussock occurs with scattered turpentine shrub, bog pine and mountain toatoa. There is some browsing damage with several dead tussocks and localised physical disturbance. Overall this wetland-shrubland complex is very diverse and naturalness is medium to high.

*Hebe* shrublands are common above the treeline near Hut Stream. They are dominated by *Hebe subalpina*, turpentine shrub, snowberry, bristle tussock, *Celmisia angustifolia*, patotara, blue tussock and midribbed snow-tussock. Other plants include browntop, little hard fern, snow-patch grass, avalanche grass, everlasting daisy, *Kelleria dieffenbachii*, native violet, Chewings fescue, lichens, *Pimelea oreophila*, *Coprosma perpusilla*, golden speargrass, false speargrass and *Brachyscome radicata*. Total shrub cover is around 20%, while snow-tussock cover is c.10%. Naturalness is medium/high to high. Nearby moraine terraces support red tussock, *Dracophyllum* shrubs, woolly moss, *Celmisia haastii* and *Pentachondra pumila*. Shrublands on colluvial fans include species such as turpentine shrub, inaka, tauhinu, *Hebe subalpina*, alpine fescue tussock, avalanche grass, mouse-ear hawkweed, tussock hawkweed, browntop and sweet vernal. There is localised animal damage and naturalness is medium.

The broad spur west of Hut Stream supports extensive manuka, kanuka, mountain kiokio, mountain flax, scattered *Dracophyllum* and mountain beech. Rocky sections of the ridge east of Hut Stream support diverse shrublands of inaka, turpentine shrub, snow totara, beech saplings, *Coprosma microcarpa*, *C. dumosa*, *C. rugosa*, *C. aff. pseudocuneata*, *Gaultheria crassa*, *G. antipoda*, *Olearia*

*arborescens*, mountain akeake, broadleaf, korokio, mountain totara, tutu, tauhinu, mountain flax, *Hebe subalpina*, mountain holly, manuka, kanuka, *Cyathodes juniperina*, southern rata, *Exocarpus bidwillii* and mountain toatoa. Species of the ground tier include extensive woolly moss, mountain clubmoss, mountain kiokio, little hard fern, *Brachyglottis haastii*, *Rytidosperma unarede*, lichens, wire moss, other mosses and cotton daisy. Despite past burning and wild animal disturbance, there are few exotic plants and naturalness is medium to high.

There are few fans and terraces on this part of the property. The part of Hut Stream fan within the property boundary supports matagouri shrubland and a few beech trees. Other species in the shrubland include mingimingi (4 m tall), *Coprosma rigida*, mountain wineberry, korokio, occasional broadleaf, lawyer and bracken.

Forest at the northwest end of the property has been affected by fire, with substantial areas being reduced to manuka/kanuka shrublands. Mountain beech forest remains on steep valley sides, such as in Hut Stream. On the ridge southeast of Hut Stream patchy beech forest occurs with a sub-canopy of mountain toatoa, mountain totara, weeping mapou, *Coprosma microcarpa*, *C. dumosa*, three finger and occasional broadleaf. The ground tier is occupied by mosses, little hard fern, broadleaf seedlings and sparse to moderate beech regeneration. The mid to lower slopes between Hut Stream and the next valley downstream support regenerating broadleaf-hardwood forest dominated by broadleaf and kowhai. Other species include kohuhu, marbleleaf, lancewood, kanuka/manuka, mountain akeake, koromiko, *Coprosma* spp. and prickly shield fern. Patches of beech forest and recently burnt areas of manuka/kanuka are also present.

Big Paddock Creek supports beech forest on shady slopes and broadleaf-hardwood forest on sunny slopes. Species in the broadleaf forest include cabbage tree, broadleaf, kohuhu, three finger, lancewood, mountain akeake, *Olearia arborescens*, kanuka, manuka, koromiko, pate, *Coprosma robusta* and rarely mountain totara. Open areas support shrubland dominated by mingimingi, three finger, mountain wineberry, korokio, yellowwood, *Coprosma rugosa*, *Astelia fragrans*, *Clematis marata*, prickly shield fern, hound's tongue fern, mountain kiokio and mountain flax. The naturalness of these forests is medium to high. Riparian margins support *Carmichaelia angustata*, tutu, exotic grasses, silver tussock, *Raoulia tenuicaulis*, everlasting daisy and *Parahebe lyallii*. The unnamed valley east of Manuka Peak contains mountain beech with scattered broadleaf, mountain holly, mountain akeake and occasional mountain totara. Shady slopes and gully head slopes support tutu, turpentine shrub, inaka, mountain holly, beech saplings, broadleaf saplings, mountain flax and what appears to be mountain toatoa when viewed through binoculars.

Small gully fans on lower slopes east of Manuka Peak support kanuka groves above a ground surface of mosses, grasses, tussock hawkweed, wall lettuce, prickly shield fern, hanging spleenwort and occasional mingimingi. The lower gullies support lancewood, five finger, marbleleaf, wineberry, kanuka, mountain akeake, cabbage tree, *Clematis* sp., bush lawyer, tutu, prickly shield fern and mountain kiokio. Mountain beech occurs further up the gullies with some trees 75 cm in diameter. Beech regeneration is common despite frequent signs of deer. Stream edges support thousand-leaved fern, tutu, young broadleaf, mountain akeake, *Coprosma rugosa*, cotton daisy, inaka and *Chionochloa conspicua*. Overall naturalness is medium to medium/high.

Short tussock grasslands occur on terraces and fans in the upper valley. They are dominated by Chewings fescue, browntop and sweet vernal, with fescue tussock and alpine fescue tussock also prominent. Other plants include white clover, *Helichrysum filicaule*, dainty daisy, catsear, *Gaultheria macrostigma*, yarrow, mouse-ear hawkweed, *Uncinia rubra*, *Gonocarpus aggregatus*, *Rytidosperma unarede*?, *Acaena inermis* and little hard fern. Naturalness is low to low/medium.

The eastern end of the fenced deer paddock in the lower valley is dominated by exotic grasses (browntop, sweet vernal, Yorkshire fog, cocksfoot, Chewings fescue), with scattered silver tussock, bracken, fescue tussock, Californian thistle, matagouri, kanuka, manuka and occasional mingimingi. Red clover and white clover are abundant and naturalness is low. A similar community extends

northwest with the addition of widespread *Gaultheria macrostigma*, cotton daisy, more kanuka and manuka, occasional cabbage trees and kowhai. Kanuka and manuka have been recently burnt, with saplings and seedlings common. Ribbons of beech forest are present in some incised gullies. This broad pattern continues up-valley to a fence on the eastern spur of a major beech-forested valley. Exotic grasses remain dominant up to this fence, with tutu and regenerating manuka, some of which has been burnt. Cotton daisy is common above 700 m. Other species are little hard fern, harebell, mountain clubmoss, patotara, everlasting daisy, dainty daisy and *Carex breviculmis*. Overall naturalness is low to low/medium. Between this valley and the next major gully, fescue tussock, *Pernettya macrostigma*, bracken, browntop and sweet vernal are prominent, with manuka/kanuka shrubland and beech remnants. Closer to the summit ridge, the vegetation is dominated by indigenous species such as cotton daisy, snowberry, midribbed snow-tussock, turpentine shrub, fescue tussock, blue tussock, *Coprosma perpusilla*, mosses and lichens.

### Notable Flora

Notable plant species recorded on the property are listed in Table Two below. Threat categories are those proposed by de Lange *et al.* (2004). Local rarity is as proposed by Arand and Glenny (1990).

**Table Two** Notable plant species, Manuka Point Pastoral Lease.

Plant species	Threat status	Distribution on property
<i>Aciphylla subflabellata</i>	Sparse	Among bog rush and silver tussock on the Rakaia River flats near the homestead.
<i>Coprosma wallii</i>	Gradual decline	In scrub and shrubland on fans adjoining the Rakaia River flats.
	<b>Significance</b>	
<i>Acaena glabra</i> ( <i>Bidibid/piripiri</i> )	Rare in ED	Beneath scrub on fan adjacent to Rocky Spur Creek, Rakaia flats.
<i>Carex kaloides</i>	Not recorded by PNAP survey	Margins of streams and wetlands on the Rakaia flats.
<i>Coprosma</i> aff. <i>pseudocuneata</i>	Not recorded by PNAP survey	Among shrubland on spur east of Hut Stream.
<i>Eleocharis acuta</i> ( <i>Sharp spike sedge</i> )	Rare in ED	Wetland below Twin Stream on Rakaia flats, and tarn on spur east of Hut Stream.
<i>Exocarpus bidwillii</i>	Not recorded by PNAP survey	On rock outcrops on spur east of Hut Stream.
<i>Forstera sedifolia</i>	Rare in ED	Moraine terrace wetland east of Hut Stream.
<i>Halocarpus bidwillii</i> ( <i>Bog Pine</i> )	Rare in ED	Among wetlands associated with moraine terraces on upper slopes immediately east of Hut Stream.
<i>Myriophyllum propinquum</i>	Not recorded by PNAP survey	In tarn on spur east of Hut Stream.
<i>Plantago novae-zelandiae</i>	Not recorded by PNAP survey	Herbfield on upper slopes near Long Spur.
<i>Poa cockayneana</i> ( <i>Avalanche grass</i> )	Rare in ED	Upper slopes east of Hut Stream.
<i>Psychrophila novae-zelandiae</i>	Rare in ED	Herbfield on upper slopes near Long Spur.
<i>Pyrrhanthera exigua</i> ( <i>Mountain twitch</i> )	Rare in ED	Dry knolls west of deer paddock and unconfirmed identification on Rakaia flats.
<i>Rytidosperma pumilum</i>	Rare in ED	In herbfield on upper slopes near Long Spur.
<i>Utricularia monanthos</i> ( <i>Bladderwort</i> )	Not recorded by PNAP survey	Tarn margins on spur east of Hut Stream.
<i>Wahlenbergia pygmaea</i>	Not recorded by	Moraine terrace wetland east of Hut Stream.

	PNAP survey	
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The significance of plants with a “Not recorded by PNAP survey” notation is that they are uncommon/not widespread within the ecological district. These plants were not recorded in the 1990 PNAP survey report and because they have now been recorded they assume a level of significance because they are uncommon within that Ecological District.

### Significance of Vegetation and Flora

The Rakaia Valley flats support extensive matagouri shrubland, with some matagouri 5-6 m tall. This shrubland and associated short tussock grassland represent original communities of the terraces and fans, though the latter are now dominated by exotic grasses. Side fans support matagouri shrubland and smaller areas of mixed shrubland, scrub and podocarp-broadleaf forest dominated by mountain totara, mountain toatoa, broadleaf, lancewood and kowhai. *Coprosma wallii* (gradual decline) occurs on these fans. The active gravels of the fans have good sequences of colonising riverbed plants, representing another original community type. Small wetlands occur at the base of fans, in depressions and alongside streams, those closer to the homestead supporting *Aciphylla subflabellata* (sparse). A number of species uncommon in the ED occur on these flats.

The upper Mathias Valley mountain slopes support a mosaic of mountain beech forest, regenerating broadleaf-hardwood forest, mixed shrubland, manuka/kanuka shrublands, herbfield, rockland and stonefield communities, all of which represent or contain elements of the original communities. Wetlands are present on moraine terraces. The vegetation in the lower valley, within the fenced deer paddock is very modified and dominated by exotic grasses. A number of species uncommon in the ED occur on these mountain slopes.

Insert Botanical Values map here



### 2.5.3 Problem Plants

Overall there are few weed problems on the property. Small patches of gorse on the Rakaia River flats and hill slopes near the homestead have been sprayed. One gorse plant was seen adjacent to the property on the Mathias River bed above Big Paddock Creek. Two elderberry trees were seen on the Rakaia flats; one has been cut down but is re-sprouting. These should be removed to minimise the risk of further spread, as the adjacent shrublands are notably weed-free.

Crack willow, hybrid willow and two Lombardy poplar trees are present on the Rakaia flats. Most of these trees are not in the property and are associated with river control plantings, but they could spread via the meandering stream channels. These should be removed before they spread further as this part of the Rakaia River bed is largely weed free. Sweet brier is sparsely scattered across the Rakaia River terraces and some side fans. It is not vigorous and is unlikely to pose a significant threat to conservation values.

Marsh thistle is present around the tarn on the spur southeast of Hut Stream and in adjacent wetlands in the Mathias Valley, and it is likely to spread further. These wetlands are ecologically significant. Marsh thistle should be removed if control is practical.

## 2.6 FAUNA

### 2.6.1 Bats

Short-tailed bats have not been recorded in Canterbury since the arrival of Europeans. Small populations of South Island long-tailed bat are present in North Canterbury and South Canterbury. There are no recent records of bats in, or near, Manuka Point

### 2.6.2 Birds

Three main bird habitats are present in the vicinity of Manuka Point Pastoral Lease: the open braided beds of the Rakaia and Mathias rivers, the montane forest- or shrubland-covered mountain slopes and the high altitude open habitats of the Southern Alps.

The Rakaia and Mathias rivers provide habitat for black-fronted tern (threat status: nationally endangered), wrybill (nationally vulnerable), black-billed gull (serious decline), Caspian tern (nationally vulnerable), grey duck (nationally endangered), banded dotterel (gradual decline), Australasian pied stilt, South Island pied oystercatcher, paradise shelduck and southern black-backed gull. Black shag (sparse) and New Zealand falcon (gradual decline) utilise habitats associated with the rivers. The introduced game bird Canada goose is common. Black stilt (nationally critical) were historically present in the Rakaia Valley (Pierce, 1984). Blue duck (nationally endangered) have been recorded from upper tributaries of the Rakaia and Mathias rivers (Cunningham, 1991).

The Rakaia and Mathias rivers, adjacent to the property, are Sites of Special Wildlife Interest (SSWI) and Wetlands of Ecological and Representative Importance (WERI). Both are rated as “outstanding” for wildlife (O’Donnell and Moore, 1983). The Rakaia River and its tributaries (including the Mathias River) are protected by a National Water Conservation Order, which requires their waters to be retained in their natural state.

The remnant mountain beech and podocarp-hardwood forests of the upper Rakaia and Mathias valleys provide habitat for kea (nationally endangered), New Zealand falcon, New Zealand pigeon (gradual decline), South Island rifleman (gradual decline) and non threatened birds such as bellbird, silvereye, South Island tomtit, brown creeper, South Island fantail, grey warbler, morepork and a number of introduced passerines. Alpine habitats in the area support kea, New Zealand falcon, New Zealand pipit and, further west, rock wren (nationally vulnerable).

Birds observed in habitats on and adjacent to Manuka Point Pastoral Lease are described for the seven main parts of the property surveyed.

#### **Rakaia River bed**

This area comprises the large strip of land between the developed grasslands on the property and the Rakaia River. It is an area of unallocated Crown land (UCL), but is grazed in conjunction with the property. Habitats present are fescue tussock grassland, matagouri-dominated shrubland, cushionfield, mossfield, small areas of sedgeland (wetland), stonefield (clean gravel) and braided river channels. Birds recorded here were wrybill, black-fronted tern, black-billed gull, banded dotterel, Australasian pied stilt, South Island pied oystercatcher, southern black-backed gull, Caspian tern, black shag, welcome swallow, Australasian harrier, grey duck, paradise shelduck, New Zealand pipit, silvereye, grey warbler, New Zealand falcon, Canada goose and introduced passerines.

### **Rakaia Valley flats**

This area covers the part of the property on the floor of the Rakaia Valley, including areas adjoining the Rakaia Forest Conservation Area on the southern slopes of the Ragged Range. It is dominated by depleted fescue tussockland and matagouri shrubland, with smaller areas of low-stature mountain totara-broadleaf forest and stonefield associated with stream fans. Birds observed on the open grasslands were New Zealand pipit, spur-winged plover, welcome swallow, Australasian harrier, New Zealand falcon and ten species of introduced passerines. Birds observed at the forest margin were New Zealand falcon, South Island rifleman, New Zealand pigeon, bellbird, grey warbler, morepork, South Island tomtit, South Island fantail, brown creeper and silvereye.

### **Islands at the confluence of the Rakaia and Mathias Rivers**

This area covers the low islands at the confluence of the Rakaia and Mathias rivers. Habitats present are exotic grassland (pasture), depleted fescue tussock grassland, sparse matagouri shrubland and mixed riparian shrubland. Birds observed on the eastern island were welcome swallow, silvereye, grey warbler and ten species of introduced passerine. Six species of introduced passerine were observed on the larger western island. The islands are surrounded by braided river beds which provide important habitat for a number of threatened bird species. Stock must traverse the open riverbed to gain access to the eastern island.

### **Mathias Valley above Jerusalem Stream**

This area covers the river flats on the floor of the Mathias Valley north of Jerusalem Stream. Habitats present are depleted fescue tussock grassland, matagouri-dominated shrubland and, at the toe of the hill slopes, mountain totara-broadleaf forest. Birds observed on the valley floor were silvereye, grey warbler, spur-winged plover, Australasian harrier, New Zealand pipit and eight introduced bird species. Birds observed on the adjoining river bed were southern black-backed gull, black shag, banded dotterel, black-fronted tern, South Island pied oystercatcher, paradise shelduck, New Zealand pipit and four introduced bird species. Birds observed in the forest were bellbird, South Island fantail, South Island tomtit, South Island rifleman, grey warbler, brown creeper, silvereye, kea and seven introduced bird species.

### **Upper Mathias Valley faces**

This area covers the northeast-facing slopes of the Ragged Range upstream from Big Paddock Creek. Habitats present are open rockland and stonefield, tall tussockland, *Dracophyllum* shrubland, mountain beech forest (especially in gullies) and mountain totara-broadleaf forest. Birds observed at higher altitudes were New Zealand pipit, Australasian harrier, kea and (in shrubland) three introduced bird species. Birds observed in forest habitats were New Zealand falcon, bellbird, South Island rifleman, South Island fantail, silvereye, grey warbler, South Island tomtit, brown creeper, long tailed cuckoo, New Zealand pigeon, kea and eight introduced bird species.

### **Lower Mathias Valley faces**

This area covers the northeast-facing slopes of the Ragged Range downstream from Big Paddock Creek. Habitats present are open rockland and stonefield, tall tussockland, *Dracophyllum* shrubland, kanuka shrubland, mountain beech forest (especially in gullies) and exotic grassland. Birds observed in patches of beech forest and regenerating shrublands were bellbird, silvereye, South Island fantail, South Island tomtit, South Island rifleman, grey warbler and six species of introduced passerine.

### Mathias Valley flats

This area comprises the small grassy terraces and areas of open braided river bed at the base of the hill slopes, most parts of which lie outside the property boundary but are affected by grazing on the property. Birds observed were black-fronted tern, southern black-backed gull, South Island pied oystercatcher, banded dotterel, black-billed gull, wrybill, spur-winged plover, grey duck, paradise shelduck, Australasian pied stilt, Australasian harrier, New Zealand pipit, black shag, Caspian tern, welcome swallow, New Zealand falcon and six introduced passerines.

### Bird Species Recorded

Forty-three bird species were recorded on Manuka Point Pastoral Lease (39 in February 2006 and four additional species in late 2005): 29 indigenous species and 14 naturalised species.

**Table Three** Indigenous bird species recorded from Manuka Point Pastoral Lease.

Bird species	Threat status	Distribution on property
Australasian harrier	Not threatened	Throughout.
Australasian pied stilt*	Not threatened	Rakaia and Mathias rivers.
banded dotterel	Gradual decline	Rakaia and Mathias rivers and terraces.
bellbird	Not threatened	Forest and shrubland throughout.
black-billed gull	Serious decline	Rakaia and Mathias rivers.
black-fronted tern	Nationally endangered	Rakaia and Mathias rivers and pasture.
black shag	Sparse	Rakaia and Mathias rivers and springs.
brown creeper	Not threatened	Forest and shrubland throughout.
Caspian tern*	Nationally vulnerable	Rakaia and Mathias rivers.
grey duck	Nationally endangered	Rakaia and Mathias rivers and springs.
grey warbler	Not threatened	Forest and shrubland throughout.
kea	Nationally endangered	Forest and alpine regions.
long-tailed cuckoo	Gradual decline	Forest.
morepork	Not threatened	Forest.
New Zealand falcon	Gradual decline	Throughout.
New Zealand pigeon	Gradual decline	Mixed broadleaf forest.
New Zealand pipit	Not threatened	Rakaia and Mathias rivers and alpine tops.
paradise shelduck	Not threatened	Rakaia and Mathias rivers and terraces.
shining cuckoo*	Not threatened	Forest.
silveryeye	Not threatened	Forest and shrubland throughout.
southern black-backed gull	Not threatened	Throughout.
South Island fantail	Not threatened	Forest, shrubland and homestead garden.
South Island pied oystercatcher	Not threatened	Rakaia and Mathias rivers and terraces.
South Island rifleman	Gradual decline	Forest and scrub.
South Island tomtit	Not threatened	Forest and shrubland.
spur-winged plover	Not threatened	Rakaia and Mathias rivers, terraces and pasture.
welcome swallow	Not threatened	Throughout.
white-faced heron	Not threatened	Rakaia River and springs.
wrybill*	Nationally vulnerable	Rakaia and Mathias rivers.

\* recorded late 2005.

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

## Significance of the Bird Fauna

Mountain beech and mountain totara-broadleaf forests on the property support threatened bird species: kea (nationally endangered), long-tailed cuckoo (gradual decline), New Zealand falcon (gradual decline), New Zealand pigeon (gradual decline) and South Island rifleman (gradual decline). Habitats on the property are in good condition. Substantial parts of the property have significant inherent values for birds. Valley floors on the property are more modified but adjoin and buffer areas of nationally important braided river bed habitat which supports a number of threatened bird species: banded dotterel (gradual decline), black-billed gull (serious decline), black-fronted tern (nationally endangered), black shag (sparse), Caspian tern (nationally vulnerable), grey duck (nationally endangered), New Zealand falcon (gradual decline) and wrybill (nationally vulnerable).

### 2.6.3 Lizards

The Department of Conservation's Herpetofauna Database contains only two records of lizards from Manuka Point Pastoral Lease: Southern Alps gecko from Hut Stream and McCann's skink from Twin Creek. Scree skink (threat status: gradual decline) and abundant populations of McCann's skink, common skink and Southern Alps gecko have been recorded from Glenfalloch Pastoral Lease across the Rakaia River. Spotted skink (gradual decline) and long-toed skink (gradual decline) have been recorded from the Lake Coleridge area. Jewelled gecko (gradual decline) and the recently discovered Rangitata skink (data deficient) have been recorded from the Rangitata Gorge.

#### Rakaia Valley flats

This area covers the part of the property on the floor of the Rakaia Valley, including areas adjoining the Rakaia Forest Conservation Area on the southern slopes of the Ragged Range. It is dominated by depleted fescue tussockland and matagouri shrubland, with smaller areas of low-stature mountain totara-broadleaf forest and stonefield associated with stream fans. One species of lizard (Southern Alps gecko) was observed on the stony fan of Twin Creek.

#### Islands at the confluence of the Rakaia and Mathias Rivers

This area covers the low islands at the confluence of the Rakaia and Mathias rivers. Habitats present are exotic grassland (pasture), depleted fescue tussock grassland, sparse matagouri shrubland and mixed riparian shrubland. No lizards were recorded in these habitats.

#### Mathias Valley above Jerusalem Stream

This area covers the river flats on the floor of the Mathias Valley north of Jerusalem Stream. Habitats present are depleted fescue tussock grassland, matagouri-dominated shrubland and, at the toe of the hill slopes, mountain totara-broadleaf forest. One species of lizard (Southern Alps gecko) was observed in talus at the edge of forest/shrubland margin at the base of the hill slope.

#### Upper Mathias Valley faces

This area covers the northeast-facing slopes of the Ragged Range upstream from Big Paddock Creek. Habitats present are open rockland and stonefield, tall tussockland, *Dracophyllum* shrubland, mountain beech forest (especially in gullies) and mountain totara-broadleaf forest. No lizards were recorded in these habitats.

### **Lower Mathias Valley faces**

This area covers the northeast-facing slopes of the Ragged Range downstream from Big Paddock Creek. Habitats present are open rockland and stonefield, tall tussockland, *Dracophyllum* shrubland, kanuka shrubland, mountain beech forest (especially in gullies) and exotic grassland. One species of lizard (Southern Alps gecko) was observed under rocks in a rock-pile at the base of a small bluff.

### **Mathias Valley flats**

This area comprises the small grassy terraces and areas of open braided river bed at the base of the hill slopes, most parts of which lie outside the property boundary but are affected by grazing on the property. No lizards were recorded in these habitats.

### **Lizard species recorded**

One species of lizard (Southern Alps gecko) was recorded from three separate locations during this survey of Manuka Point Pastoral Lease. McCann's skink has been previously recorded from Twin Creek.

### **Significance of lizard fauna**

Manuka Point Pastoral Lease provides relatively extensive areas of apparently suitable habitat for lizards, including habitat that is potentially suitable for threatened species. Two species of lizard have been recorded from the property, though conditions during this survey were not ideal. Lizard habitats on the property are contiguous with extensive areas of intact habitat on adjoining protected land and pastoral leases.

Insert Bird and Lizard Values map here

## 2.6.4 Freshwater Fauna (fish and invertebrates)

Manuka Point Pastoral Lease is drained by tributaries of the Rakaia and Mathias rivers, including Jellicoe Stream, Rocky Spur Creek, Twin Creek, Broad Creek and Big Fan Creek in the Rakaia Valley, and Jerusalem Stream, Hut Stream and Big Paddock Creek in the Mathias Valley. The Rakaia River runs along the southern boundary of the property, and the Mathias River runs along the northeast boundary. The two rivers converge at the eastern corner of the property. The extensive wide gravel beds of the two rivers adjoining the property are unallocated Crown land (UCL).

One of the distinguishing features of the Rakaia River is that it 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 Rakaia River and its upper tributaries are protected by a National Water Conservation Order.

The New Zealand Freshwater Fish Database (NZFFD) has 225 records from the Rakaia River catchment (at 15<sup>th</sup> of April 2006). Species recorded from rivers and streams near the property are longfin eel, alpine galaxias, Canterbury galaxias, koaro, upland longjaw galaxias, upland bully, torrentfish, lamprey, Chinook salmon, rainbow trout, brook char and brown trout. Three of these species are considered threatened by Hitchmough and Bull (*in press*): longfin eel (threat status: gradual decline), upland longjaw galaxias (gradual decline) and lamprey (sparse).

Manuka Point Pastoral Lease comprises two main geographic areas of freshwater habitat, classified by physical character and location. Freshwater habitats and the fish and macro-invertebrate species recorded are described below for each of these areas.

### Mathias River Area

This area covers the northern part of the property, in the Mathias Valley, and includes the two small parts of the property at the confluence of the Rakaia and Mathias rivers. This area is steep, with ephemeral streams in the smaller gullies and larger permanent streams in the deeply incised gorges. The Mathias River flows along the lower boundary of this area. The two islands have low relief and only ephemeral streams, although the Mathias River cuts in close to them. A small wetland is present near the hut in the upper Mathias Valley. A wetland-shrubland complex occurs on some upper slopes in the Hut Stream vicinity. The main streams in this area flow through forest, scrub, shrubland and tussockland. The larger streams are incised within steep rocky gorges in their middle reaches and have wide gravel beds in their lower reaches. Stock and wild animal access is unrestricted except by steep rocky terrain in some areas.

The Mathias River is generally between 20 and 40 metres wide and ranges in depth from c.800 mm at rapids to over two metres in pools. The contributing streams are mostly between one and three metres wide, though are up to six metres wide in their upper reaches and are frequently dry (flowing underground) in their lower reaches near the Mathias River. They vary in depth from c.100 mm near the Mathias River, to about 700 mm in the upper reaches, with pools over one and a half metres deep. The wetland is approximately five hectares in size and has no surface water. Small streams flowing from the wetland are less than one metre wide and 200 to 300 mm deep. River substrates are mainly boulders and cobbles, with some gravel. The stream substrates are generally cobbles and gravels with a few boulders, and bedrock and boulders in the upper reaches. The wetland and wetland stream substrates are mud and silt.

Five sites were electro-fished in this area: four in large gorgy streams (Jerusalem Stream, upper Hut Stream (west of the property), lower Hut Stream and Big Paddock Creek, and one in a wetland stream. Alpine galaxias were found at three sites (Jerusalem Stream, lower Hut Stream and Big



Paddock Creek) and Canterbury galaxias at one site (Big Paddock Creek). No records of other species are listed for the Mathias River or its tributaries in the NZFFD.

Macro-invertebrates observed in this area were: *Deleatidium* spp., *Nesameletus* sp., *Megaleptoperla grandis*, *Spaniocerca* sp., *Zelandobius* sp., *Hydrobiosis* sp., *Hydropsychidae* sp., *Neocurupira* sp., and *Elmidae* sp. Aquatic invertebrates were generally indicative of good water quality.

### Rakaia River Area

This area covers the part of the property on the river flats between the Rakaia River and the Rakaia Forest Conservation Area on the southern slopes of the Ragged Range. Several small streams flow from the steep slopes north of the property boundary across these flats to a larger stream flowing down the river flats south of the property. These small streams flow across gravel fans at the base of the hill slopes and then through narrower channels across the flats. This part of the property is characterised by gravel fans, small streams and associated springs and seepages. The streams flow through small areas of forest at the base of the hill slopes, and matagouri shrubland, depleted fescue tussock grassland and exotic grassland on the flats. Areas of sedgeland and rushland are present in the small wetlands and seepages. Stock and wild animal access is unrestricted and the streams are crossed by vehicle tracks.

The streams are mostly less than one metre wide and 100 to 300 mm deep. The main stream which flows down the flats along and south of the property boundary is six metres wide in its middle reaches and over 20 metres wide in its lower reaches below the homestead. The streams substrates are generally cobbles and gravels, with boulders in some areas and mud and silt in others.

Six sites were electro-fished in this area: two in gravel-fan streams (branches of Jellicoe Stream), two in spring-fed streams, and two in the main stream adjacent to the property boundary. Alpine galaxias were found at four sites (Jellicoe Stream, a spring-fed stream and at the two main stream sites), Canterbury galaxias at three sites (the two branches of Jellicoe Stream and a spring-fed stream), upland bully at three sites (two spring-fed streams and the main stream), brown trout at three sites (one spring-fed stream and at the two main stream sites) and Chinook salmon at two sites in the main stream. Additional species recorded in the NZFFD are longfin eel, koaro, upland longjaw galaxias, torrentfish, lamprey, rainbow trout and brook char.

Macro-invertebrates observed in this area were: *Coloburiscus humeralis*, *Deleatidium* spp., *Nesameletus* sp., *Zephlebia* sp., *Megaleptoperla grandis*, *Spaniocerca* sp., *Hydropsychidae* sp., *Pycnocentria* sp., *Pycnocentroides aeris*, *Aphrophila* sp., *Rhantus* sp. and *Potamopyrgus* sp. Aquatic invertebrates were generally indicative of good water quality.

### Species Recorded

Five fish species were recorded during this survey of Manuka Point Pastoral Lease.

**Table Four** Fish species recorded from Manuka Point Pastoral Lease, February 2006.

Fish Species	Threat Status	Known Distribution on Property
alpine galaxias	Not threatened	Large and small streams, Rakaia and Mathias valleys.
brown trout	Introduced	Large streams, Rakaia Valley.
Canterbury galaxias	Not threatened	Large and small streams, Rakaia and Mathias valleys.
Chinook salmon	Introduced	Large streams, Rakaia Valley.
upland bully	Not threatened	Large and small streams, Rakaia Valley.

### **Significance of the Freshwater Fauna**

Freshwater habitats on the property are in good condition and support species typical of such habitats. A spring-fed stream on the flats of the Rakaia Valley adjacent to the southern boundary of the property supports a diverse fish fauna comprising populations of three indigenous species. Aquatic invertebrates were generally indicative of good water quality. Freshwater habitats on the property are contiguous with extensive intact habitats elsewhere in the Rakaia River catchment. The Rakaia River catchment is listed as “Type I” Waters of National Importance (Chadderton *et al.*, 2004), and the Rakaia River and its upper tributaries are protected by a National Water Conservation Order.

Insert aquatic values map in here

## 2.6.5 Terrestrial Invertebrates

There is little existing information about the invertebrate fauna of this area. Benthic (bottom dwelling) invertebrates of the Rakaia River and its tributaries have been studied, terrestrial arthropods of Wilberforce Forest have been described, and alpine grasshoppers (*Brachaspis nivalis*, *Sigauss villosus* and *Paprides nitidus*) have been recorded in tussocklands (Arand and Glenny, 1990). An entomological assessment of Glenfalloch Pastoral Lease, south of Manuka Point Pastoral Lease across the Rakaia River, recorded several significant invertebrate species: two unnamed snail species *Powellaoma* 'arandi' and *Powellaoma* 'gigantea' (threat status: range restricted), *Brachaspis* 'lowland' (nationally endangered) on low altitude screes, an uncommon alpine tiger beetle *Neocicindela hamiltoni* on scree, and the scarce grasshopper *Sigauss villosus* above 1800 m altitude on the Palmer Range (Morris, 2005).

Invertebrates of Manuka Point Pastoral Lease are described below for the five distinct habitats surveyed.

### Rakaia Valley, lower flats

Shrublands in this area provide good habitat for spiders and soil-dwelling insects. A rich diversity of flies was observed, including species of blowfly, house fly, soldier fly, fruit fly and hover fly. Numerous species of spider, caterpillar and ichneumon wasp were observed on shrubland foliage, and species of cockroach, beetle, weevil, mite, woodlice, ant, springtail, spider and centipede observed in the grass layer. Streams on the lower flats are in excellent condition with a variety of habitats and substrates. A rich diversity of aquatic invertebrates was observed, including species of caddisfly, mayfly, stonefly, fly, damselfly and beetle.

### Rakaia Valley, upper flats

Shrublands in this area appear younger than those on the lower flats. Invertebrates observed here were species of beetle, weevil, mite, woodlice, ant, spider, caterpillar and ichneumon wasp. Grassland habitats in this area are generally modified. However, small isolated patches of shrubland are present at the grassland margins. Species observed here were New Zealand grasshopper, tussock butterfly, and species of ant, black cricket, wasp, tiger beetle, robber fly, spider wasp and ground-nesting sub-social bee. Two grassland moths (*Orocrambus vittellus* and *Udea flavidalis*), the grasshopper *Sigauss campestris* (at its western distributional limit) and species of centipede, millipede and ground beetle were observed in small areas of tussockland at the base of the hill slopes. Species of fly, black cricket, wasp, beetle, cockroach, black cicada, ant, blue blowfly, brown blowfly, crane fly, hover fly, robber fly, ichneumon wasp, spider wasp, ground-nesting sub-social bee, spider, longhorn grasshopper and shorthorn grasshopper were observed on and around a large rock outcrop at the eastern end of the Ragged Range.

### Rakaia Valley, forest edge and gravel fans

Three small areas of forest are present at the edge of the flats on the property in the Rakaia Valley. The ground cover and deep leaf litter within these forests are in excellent condition, providing good habitat for ground-dwelling invertebrates. Observed here were species of ground beetle, darkling beetle, weevil, springtail, spider, isopod, woodlice, centipede, millipede and cave weta. Numerous wood-boring invertebrates were observed, including beetles in the Curculionidae, Scarabaeidae and Cerambycidae families.

Low altitude stream fans are present between Jellicoe Stream and Big Fan Creek. These gravel fans support a diverse range of insects that favour dry stony habitats. The grasshopper *Brachaspis* 'lowland' (nationally endangered) was recorded from all the fans. The uncommon alpine tiger beetle *Neocicindela hamiltoni* is also likely to be present in this habitat (though it was not observed

during this survey). Other invertebrates observed here were red admiral butterfly, red damselfly, Gray's dragonfly, Chilton's giant dragonfly (at its western distributional limit) and the moths (*Diasemia grammalis*, *Arctesthes catapyrrha*, *Paranotoreas brephosata* and *Asaphodes clarata*).

### Mathias Valley, higher-altitude slopes

Higher-altitude invertebrate habitats are in good condition and have high naturalness values. A diverse invertebrate fauna was observed, including boulder copper butterfly, tussock ringlet butterfly, brown blowfly, and species of crane fly, hover fly, robber fly, ichneumon wasp, solitary bee, spider wasp, ground-nesting sub-social bee, weevil, tiger beetle, darkling beetle, longhorn beetle, wolf spider, jumping spider, longhorn grasshopper, cockroach and ant. Four species of grasshoppers are present above 1200 m altitude: *Brachaspis nivalis*, *Paprides nitidus*, *Sigaüs australis* (all at their western distributional limit) and the New Zealand grasshopper.

A rich diversity of diurnal moths was observed at both alpine sites inspected, including *Heliothela atra*, *Dasyuris anceps*, *Dasyuris austrina*, *Notoreas blax*, *Notoreas ischnocyma* and an unnamed species of *Notoreas*. The black mountain ringlet was recorded above 1500 m on Long Spur, and large numbers of black cicadas are present in the boulder fields. Five species of damselfly and dragonfly were observed at a small wetland complex at 1030 m on a spur above Hut Creek: red damselfly, blue damselfly, Gray's dragonfly, Chilton's giant dragonfly (at its western distributional limit) and *Hemianax papuensis*. Large diving beetles were observed in the largest of the ponds.

### Mathias Valley, montane slopes

Grassland habitats are present on the lower hill slopes in this area. Invertebrate diversity here is moderate with many common species present, including New Zealand grasshopper and species of copper butterfly, black cricket and ant. Shrubland habitats on the lower slopes are in good condition. Invertebrates observed in and on the margin of shrublands were species of blowfly, crane fly, hover fly, robber fly, ichneumon wasp, spider wasp, longhorn grasshopper, cicada, ant, weevil, tiger beetle, cricket, wolf spider, jumping spider, cockroach, mite, isopod, woodlice, springtail, centipede and millipede. Forest habitats in this area were not inspected but appear to provide good invertebrate habitat. Streams in this area are in good condition and support species of caddisfly, mayfly, stonefly, fly and beetle.

### Species Recorded

**Table Five** Notable invertebrate species recorded from Manuka Point Pastoral Lease, February 2006.

Species	Significance	Distribution on Property
<i>Brachaspis</i> 'lowland'	Nationally endangered*; at its western distributional limit.	Gravel fans between Jellicoe Stream and Big Fan Creek.
<i>Brachaspis nivalis</i>	At its western distributional limit.	Mathias valley upper slopes.
<i>Notoreas</i> n. sp.	New (unnamed) species.	Mathias valley upper slopes.
<i>Paprides nitidus</i>	At its western distributional limit.	Mathias valley upper slopes.
<i>Sigaüs australis</i>	At its western distributional limit.	Mathias valley upper slopes.
<i>Sigaüs campestris</i>	At its western distributional limit.	Rakaia Valley, upper flats.
<i>Uropetala chiltoni</i> (Chiltons Giant Dragonfly)	At its western distributional limit.	Mathias valley upper slopes; Rakaia Valley forest edge.

\* Threat status from Hitchmough and Bull (*in press*).

### **Significance of the Invertebrate Fauna**

Areas of shrubland, forest and gravel fan in the Rakaia Valley, and areas on the upper slopes of the Mathias Valley provide important invertebrate habitats and support significant invertebrate communities. Higher-altitude habitats support a diverse Lepidoptera, Odonata and Orthoptera fauna, including an unnamed species of Lepidoptera (*Notoreas* sp.). A number of invertebrate species reach their western distributional limit on the property. One threatened species of grasshopper is present on the gravel stream fans in the Rakaia Valley: *Brachaspis* 'lowland' (nationally endangered).

Insert Terrestrial Invertebrate map in here

## 2.6.6 Problem Animals

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

### Brushtail possum

Possum sign was observed throughout the property. Possums are browsers of palatable indigenous plants and predators of birds, lizards and invertebrates. Possum control was being undertaken in forests adjacent to the Rakaia Valley part of the property during the survey.

### Red deer

Red deer sign was observed at higher altitudes on the property.

### Chamois and thar

Chamois are present (D Patterson, Pers Comm, Nov 2005) and thar are likely to be present in the mountainous country adjacent to the property. The property lies outside the 1992 breeding range identified in the Himalayan Thar Control Plan (Department of Conservation, 1993).



## 2.7 HISTORIC

### 2.7.1 European Heritage Values

The first part of Manuka Point taken up for grazing, Run 447 comprising 2023 ha (5000 acres), was allotted to Joseph Palmer in 1863. Palmer added Run 508 (2023 ha) the following year, though did not stock either run. Manuka Point was sold to William Gerard in 1874. Gerard stocked the runs and burnt "thousands of acres of scrub" (Acland, 1951). The property was known as rough country with extensive areas of bush. Manuka Point transferred to Gerard's daughter in the 1890s, then to the Scotts of Windwhistle and then to T.S. Johnstone. During this time the homestead was moved from the point to its present position in the Rakaia Valley. J.H.C. Bond and George Gerard bought the property in 1920. Bond sold the property to Lawrence Walker in 1937 (Acland, 1951). Walker was still farming the property in 1975. More country was added to Manuka Point over the years until in 1954 it covered 8890 ha. In 1971 it had an area of 7082 ha (17500 acres). Since then approximately 5000 ha on the upper slopes of the Ragged Range have been retired from grazing. For a time the country further up the Rakaia Valley, between Totara Point and Whitcombe Pass, was taken up as a separate run. That run was abandoned after the loss of most of the flock of 2000 sheep in the winter of 1895 (Acland, 1951).

The original homestead and woolshed were located under the toe of the "Point" and built around 1890. The threat of flooding prompted a move to the present site with the current woolshed being built by Gideon Johnstone in 1916 using some of the original timbers. The earliest names in the wool room are I York 1937 and T Porter 1942. Grace and Ted Porter were joint authors of the book "Under the nor'west arch; a high country story". There is also "Opie 1882"; however, it is unlikely that this is genuine. It is possible that there are some archaeological remains of occupation at the original homestead and woolshed sites.

The 4 stand (3 stands with machines for crutching) corrugated iron clad woolshed is predominately framed and raftered with hand adzed beech timber, the rear wall being traditional sawn timber framing. In 1973 the weatherboard wall cladding was removed and replaced with the corrugated iron from the roof and a new corrugated iron roof put on. There are the remains of a wool loft to store wool bales at the west end which once extended almost to the other end of the shed. The floor joists for the loft which now act as collar ties are also hand adzed beech. The loft door in the west wall is still evident from the inside, but has been covered over with corrugated iron. There appears to be no evidence of a bale lift. Some modernisation has been carried out on the interior e.g. chip board shearing board. In the late 70's or early 80's a covered yard was added at the rear giving a shed capacity of 700 fully woolled sheep. This structure has beech pole rafters and tanalised studs. The woolshed has some historic merit.

Three huts are present on the property. They are Jellicoe Hut, Centennial Cabin (both Manuka Point Station huts) and the New Zealand Deerstalkers hut which is also known as Mathias Hut. Mathias Hut is of historic interest.

There are no other historic buildings or structures on the run.

#### Significance of Historic Resources

The Manuka Point Woolshed has historic merit. Mathias Hut has historic interest. There are no other historic buildings or structures on the property.

## **2.8 PUBLIC RECREATION**

### **2.8.1 Physical Characteristics**

The property can be divided into two main recreation units.

#### **Valley Floors Unit**

This recreation unit covers the river flats and terraces on the floor of the Rakaia Valley and the strip of valley-floor country in the Mathias Valley. It is characterised by its gentle relief and accessibility. Plant communities are predominantly open grassland, depleted tussockland and scattered to dense matagouri shrubland. The area adjoins the extensive areas of open grassland, mossfield and stonefield on the wide braided beds of the Rakaia and Mathias rivers (UCL). In the Rakaia Valley, the unit is traversed by vehicle tracks. It is fenced into large paddocks and has the homestead and farm buildings. Jellicoe Hut (Manuka Point Station) is situated on the fan east of Jellicoe Stream. Centennial Cabin (Manuka Point Station) and the New Zealand Deer Stalkers Hut (Mathias Hut) are situated on a fan on the true right of the Mathias River, upstream of the Mathias River and Jerusalem Stream confluence. The unit provides a relatively natural setting for recreation with spectacular views of the surrounding mountains, though with a semi-rural character closer to the homestead and farm buildings.

#### **Mathias Faces Unit**

This recreation unit covers the higher-altitude parts of the property on the northeast slopes of the Ragged Range. It is characterised by moderately-steep to steep terrain, including the precipitous gorges of the main side streams. It supports a mosaic of plant communities with rockland, stonefield (scree), tussockland and shrubland at higher altitudes and forest, scrub, tussockland and grassland on montane slopes. There are no vehicle tracks or buildings within this recreation unit, though the down-valley slopes are deer-fenced. The unit is clearly visible from other parts of the Mathias Valley, but largely hidden from accessible public vantage points. It provides a largely natural setting for recreation.

### **2.8.2 Legal Access**

#### **Roads**

There are no formed legal roads to the property. Access is presently via a roughly formed vehicle track across the wide unstable bed of the Rakaia River from Double Hill Run Road. Unformed legal roads join to the property from the south side of the Rakaia Valley at Double Hill and from the lower Mathias Valley just above the confluence of the Rakaia River. An unformed legal road traverses the part of the property on the floor of the Rakaia Valley, approximately following the line of an existing vehicle track. This legal road continues up the Rakaia Valley beyond the property.

#### **Marginal Strips**

No marginal strips appear to be present along streams on or within the property boundaries. However, the wide beds of the Rakaia and Mathias rivers and the bed of Jerusalem Stream are unallocated Crown land (UCL).

### **Adjoining Public Conservation Land**

The property adjoins public conservation land or UCL on all its boundaries. It adjoins Rakaia Forest Conservation Area (Conservation Land Unit J35002) on the south slopes of the Ragged Range and north of the property in the upper Mathias Valley, Manuka Point Retirement Area (J34003) on the upper slopes of the Ragged Range, Rangitata-Rakaia Headwaters Conservation Area (J35001) on the mountains to the west, and part of the small Rakaia Riverbed Martello Cliffs Conservation Area (K35001) on the valley floor east of the property.

### **2.8.3 Activities**

Higher-altitude parts of the property on the Ragged Range provide good opportunities for tramping, hunting and climbing. There are no tracks or roads within this area, but the long and relatively gentle east ridge of Manuka Peak provides an excellent route to the range summit and public conservation land beyond. The ridge crest offers spectacular views of the Rakaia and Mathias valleys and the surrounding mountain ranges. Lower-altitude parts of the property on the floor of the Rakaia Valley provide opportunities for walking, tramping, mountain-biking, horse-riding and four-wheel-drive vehicle use. Importantly this area covers part of the most practical route for access into the upper Rakaia Valley, especially for vehicle access. The upper Rakaia Valley is well used by trampers, hunters and climbers, and forms part of the historic and well-known route across the main divide via Whitcombe Pass. Adjoining areas of riverbed in the Rakaia and Mathias valleys offer good opportunities for bird-watching and fishing.

### **Significance of Recreation**

Significant features of the property for recreation are the extensive areas of highly natural country at higher altitudes that adjoin the property in the upper Rakaia and Mathias valleys. Three important routes which provide access to those areas are present on the property: the route to the upper Rakaia Valley which crosses the river flats within the property, the route to Manuka Peak and the Ragged Range which follows the long gentle east ridge of the range along the boundary of the property and access to the Mathias riverbed.

## **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 5<sup>th</sup> September 2005 and at Geraldine on 6<sup>th</sup> September 2005. Comments made at those meetings are summarised below.

- The adjoining riverbed has very important habitat values for birds, including nationally-important colonies of black-fronted tern. These habitats should be buffered from the effects of activities on adjoining land and protected from four-wheel-drive vehicles.
- Protection of sequences linking the riverbed with adjoining mountain slopes is important.
- The property is part of the spectacular upper Rakaia landscape; a landscape of high natural value.
- Whole property protection is appropriate, except for small areas that should logically be incorporated with freehold parts of Glenfalloch.
- Surrender of the retired land on the Ragged Range should occur automatically, and should not affect tenure review outcomes.
- The vehicle track through the property provides important four-wheel-drive access to the upper Rakaia Valley. Four-wheel-drive access is required for trips to the glacier and access for hunting, tramping, climbing, canoeing and mountain-biking. Vehicle access along this road should be formalised.
- The Rakaia Valley is popular for tramping, hunting and four-wheel-drive vehicle use.
- The existing vehicle track appears to follow an existing legal road; legal vehicle access should be formalised along the existing road. The existing formed road can be deemed to be the legal road as part of the survey process.

### **3.2 DISTRICT PLANS**

Manuka Point Pastoral Lease lies within the Rural C Zone of the Ashburton District. Valley-floor parts of the property are part of an Area of Outstanding Landscape; all other parts of the property are part of an Area of Significant Landscape. The Rakaia Valley part of the property is surrounded by, though not part of, a Group 1 Area of Significant Conservation Value on the Ragged Range and on the beds of the Rakaia and Mathias rivers.

### **3.3 CONSERVATION MANAGEMENT STRATEGIES**

Manuka Point Pastoral Lease lies within the Rangitata Place Unit of the Canterbury Conservancy. Relevant priority objectives for this unit listed in the Canterbury Conservation Management Strategy (CMS) (Department of Conservation, 2000) are:

- To identify the significant indigenous vegetation and threatened plant and animal species of the Rangitata Unit.
- To use a range of effective methods to protect the indigenous biodiversity of the Rangitata Unit.
- To protect and enhance the viability of threatened species' populations and their habitats in the Rangitata Unit.

- To promote appropriate land tenure, reserve status and RMA protection to protect natural character values and provide for appropriate recreation.
- To reduce the impact of wild animals, particularly tahr, on indigenous plant communities by managing them at specified density levels.
- To investigate conservation park status for land managed by the Conservancy in the upper Rangitata and Rakaia and, if agreed to by the Minister, gazette a conservation park.

### **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 referred to in text

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, 10<sup>th</sup> 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>
alpine fescue tussock.....	<i>Festuca matthewsii</i>
alpine rush.....	<i>Marsippospermum gracile</i>
avalanche grass.....	<i>Poa cockayneana</i>
beech/tawhai.....	<i>Nothofagus</i> spp.
bladderwort.....	<i>Utricularia monanthos</i>
blue tussock.....	<i>Poa colensoi</i>
blue wheatgrass.....	<i>Elymus solandri</i>
bog pine.....	<i>Halocarpus bidwillii</i>
bog rush.....	<i>Schoenus pauciflorus</i>
bracken.....	<i>Pteridium esculentum</i>
bristle tussock.....	<i>Rytidosperma setifolium</i>
broadleaf/kapuka.....	<i>Griselinia littoralis</i>
browntop*.....	<i>Agrostis capillaris</i>
bush lawyer.....	<i>Rubus cissoides</i>
cabbage tree/ti rakau.....	<i>Cordyline australis</i>
Californian thistle*.....	<i>Cirsium arvense</i>
catsear*.....	<i>Hypochoeris radicata</i>
Chewings fescue*.....	<i>Festuca rubra</i>
cocksfoot*.....	<i>Dactylis glomerata</i>
comb sedge.....	<i>Oreobolus pectinatus</i>
common pennywort.....	<i>Hydrocotyle novae-zeelandiae</i>
cotton daisy/tikumumu.....	<i>Celmisia spectabilis</i>
crack willow*.....	<i>Salix fragilis</i>
creeping buttercup*.....	<i>Ranunculus repens</i>
creeping mapou.....	<i>Myrsine nummularia</i>
creeping pohuehue.....	<i>Muehlenbeckia axillaris</i>
dainty daisy.....	<i>Celmisia gracilentia</i>
edelweiss.....	<i>Leucogenes grandiceps</i>
elderberry*.....	<i>Sambucus nigra</i>
everlasting daisy.....	<i>Helichrysum bellidioides</i>
false speargrass/taramea.....	<i>Celmisia lyallii</i>
feathery tutu.....	<i>Coriaria plumosa</i>
fescue tussock.....	<i>Festuca novae-zeelandiae</i>
golden speargrass/taramea.....	<i>Aciphylla aurea</i>

gorse*	<i>Ulex europaeus</i>
hanging spleenwort	<i>Asplenium flaccidum</i>
harebell	<i>Wahlenbergia albomarginata</i>
haresfoot trefoil*	<i>Trifolium arvense</i>
hound's tongue fern	<i>Microsorium pustulatum</i>
inaka	<i>Dracophyllum uniflorum</i>
jointed rush*	<i>Juncus articulatus</i>
kanuka	<i>Kunzea ericoides</i>
king devil hawkweed*	<i>Hieracium praealtum</i>
kohuhu	<i>Pittosporum tenuifolium</i>
korokio	<i>Corokia cotoneaster</i>
koromiko	<i>Hebe salicifolia</i>
kowhai	<i>Sophora microphylla</i>
lancewood	<i>Pseudopanax crassifolius</i>
lawyer	<i>Rubus schmidelioides</i>
little hard fern	<i>Blechnum penna-marina</i>
Lombardy poplar*	<i>Populus nigra</i>
manuka	<i>Leptospermum scoparium</i>
marbleleaf	<i>Carpodetus serratus</i>
marsh thistle*	<i>Cirsium palustre</i>
matagouri	<i>Discaria toumatou</i>
matai	<i>Prumnopitys taxifolia</i>
midribbed snow-tussock	<i>Chionochloa pallens</i>
mingimingi	<i>Coprosma propinqua</i>
mountain akeake	<i>Olearia avicenniifolia</i>
mountain beech	<i>Nothofagus solandri</i> var. <i>cliffortioides</i>
mountain clubmoss	<i>Lycopodium fastigiatum</i>
mountain flax/wharariki	<i>Phormium cookianum</i>
mountain holly	<i>Olearia ilicifolia</i>
mountain kiokio	<i>Blechnum montanum</i>
mountain oat grass	<i>Deyeuxia avenoides</i>
mountain ribbonwood/houhi	<i>Hoheria lyallii</i>
mountain toatoa	<i>Phyllocladus alpinus</i>
mountain totara	<i>Podocarpus hallii</i>
mountain wineberry	<i>Aristotelia fruticosa</i>
mouse-ear chickweed*	<i>Cerastium fontanum</i>
mouse-ear hawkweed*	<i>Hieracium pilosella</i>
native broom	<i>Carmichaelia australis</i>
native jasmine	<i>Parsonsia capsularis</i>
native violet	<i>Viola cunninghamii</i>
onion-leaved orchid	<i>Prasophyllum colensoi</i>
oxeye daisy*	<i>Leucanthemum vulgare</i>
pate	<i>Schefflera digitata</i>
patotara	<i>Leucopogon fraseri</i>
pohuehue	<i>Muehlenbeckia australis</i>
porcupine shrub	<i>Melicytus alpinus</i>
prickly shield fern	<i>Polystichum vestitum</i>
purging flax*	<i>Linum catharticum</i>
rautahi	<i>Carex coriacea</i>
red clover*	<i>Trifolium pratense</i>
red tussock	<i>Chionochloa rubra</i>
red woodrush	<i>Luzula rufa</i>
sandwort*	<i>Arenaria serpyllifolia</i>
scabweed	<i>Raoulia australis</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>
silvery hair grass*	<i>Aira caryophylla</i>
snowberry	<i>Gaultheria depressa</i>
snow daisy	<i>Celmisia laricifolia</i>
snow-patch grass	<i>Chionochloa oreophila</i>
snow totara	<i>Podocarpus nivalis</i>
snow tussock	<i>Chionochloa</i> sp.
soft rush*	<i>Juncus effusus</i>
southern rata	<i>Metrosideros umbellata</i>
sphagnum moss	<i>Sphagnum</i> sp.
spike sedge	<i>Eleocharis acuta</i>
sweet brier*	<i>Rosa rubiginosa</i>
sweet vernal*	<i>Anthoxanthum odoratum</i>
tall tussock	<i>Chionochloa</i> sp.
tarweed*	<i>Parentucellia viscosa</i>
tauhinu	<i>Ozothamnus leptophyllus</i>
thousand-leaved fern	<i>Hypolepis millefolium</i>
three finger	<i>Pseudopanax colensoi</i>
tumble grass	<i>Lachnograstis filiformis</i>
turpentine shrub	<i>Dracophyllum uniflorum</i>
tussock hawkweed*	<i>Hieracium lepidulum</i>
tutu	<i>Coriaria sarmentosa</i>
wall lettuce*	<i>Mycelis muralis</i>
weeping mapou	<i>Myrsine divaricata</i>
white clover*	<i>Trifolium repens</i>
wineberry	<i>Aristotelia serrata</i>
wire moss	<i>Polytrichum juniperinum</i>
woolly moss	<i>Racomitrium pruinosum</i>
yellow tree-daisy	<i>Brachyglottis cassinioides</i>
yellowwood	<i>Coprosma linariifolia</i>
Yorkshire fog*	<i>Holcus lanatus</i>

### Animal Species referred to in text

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>
alpine galaxias	<i>Galaxias paucispondylus</i>
Australasian harrier/kahu	<i>Circus approximans</i>
Australasian pied stilt/poaka	<i>Himantopus himantopus leucocephalus</i>
Australian magpie*	<i>Gymnorhina tibicen</i>
banded dotterel	<i>Charadrius bicinctus bicinctus</i>
bat	see South Island long-tailed bat
bellbird/korimako	<i>Anthornis melanura melanura</i>
black-billed gull	<i>Larus bulleri</i>
blackbird*	<i>Turdus merula</i>



black cicada.....	<i>Maoricicada</i> sp.
black-fronted tern.....	<i>Sterna albostrata</i>
black mountain ringlet.....	<i>Percnodaimon pluto</i>
black shag/koau.....	<i>Phalacrocorax carbo novaehollandiae</i>
black stilt/kaki.....	<i>Himantopus novaeseelandiae</i>
blue damselfly.....	<i>Austrolestes colenonis</i>
blue duck/kowhiowhio.....	<i>Hymenolaimus malacorhynchos</i>
blue damselfly.....	<i>Austrolestes colenonis</i>
boulder copper butterfly.....	<i>Lycaena boldenarum</i>
brook char*.....	<i>Salvelinus fontinalis</i>
brown blowfly.....	<i>Calliphora stygia</i>
brown creeper.....	<i>Mohoua novaeseelandiae</i>
brown trout*.....	<i>Salmo trutta</i>
brushtail possum*.....	<i>Trichosurus vulpecula</i>
Canada goose*.....	<i>Branta Canadensis maxima</i>
Canterbury galaxias.....	<i>Galaxias vulgaris</i>
Caspian tern.....	<i>Sterna caspia</i>
chaffinch*.....	<i>Fringilla coelebs</i>
Chilton's giant dragonfly.....	<i>Uropetala chiltoni</i>
Chinook salmon*.....	<i>Oncorhynchus tshawytscha</i>
common skink.....	<i>Oligosoma nigriplantare polychroma</i>
dunnock*.....	<i>Prunella modularis</i>
goldfinch*.....	<i>Carduelis carduelis</i>
Gray's dragonfly.....	<i>Procordulia grayi</i>
greenfinch*.....	<i>Carduelis chloris</i>
grey duck/parera.....	<i>Anas superciliosa superciliosa</i>
grey warbler/riroriro.....	<i>Gerygone igata</i>
Himalayan tahr*.....	<i>Hemitragus jemlahicus</i>
house sparrow*.....	<i>Passer domesticus</i>
jewelled gecko.....	<i>Naultinus gemmeus</i>
kea.....	<i>Nestor notabilis</i>
koaro.....	<i>Galaxias brevipinnis</i>
lamprey/kanakana.....	<i>Geotria australis</i>
longfin eel/tuna.....	<i>Anguilla dieffenbachii</i>
long-tailed cuckoo/koekoea.....	<i>Eudynamys taitensis</i>
long-toed skink.....	<i>Oligosoma longipes</i>
McCann's skink.....	<i>Oligosoma maccanni</i>
mallard*.....	<i>Anas platyrhynchos platyrhynchos</i>
morepork/ruru koukou.....	<i>Ninox novaeseelandiae novaeseelandiae</i>
New Zealand falcon/karearea.....	<i>Falco novaeseelandiae</i>
New Zealand grasshopper.....	<i>Phaulacridium marginale</i>
New Zealand pigeon/kereru.....	<i>Hemiphaga novaeseelandiae novaeseelandiae</i>
New Zealand pipit/pihoihoi.....	<i>Anthus novaeseelandiae novaeseelandiae</i>
paradise shelduck/putakitaki.....	<i>Tadorna variegata</i>
possum*.....	see brushtail possum
rainbow trout*.....	<i>Oncorhynchus mykiss</i>
Rangitata skink.....	<i>Oligosoma</i> sp.
red admiral/kahukura.....	<i>Bassaridius gonerilla gonerilla</i>
red damselfly.....	<i>Xanthocnemis zealandica</i>
red deer*.....	<i>Cervus elaphus scoticus</i>
redpoll*.....	<i>Carduelis flammea</i>
rock wren.....	<i>Xenicus gilviventris</i>
scree skink.....	<i>Oligosoma waimatense</i>
shining cuckoo/pipiwharuroa.....	<i>Chrysococcyx lucidus lucidus</i>
short-tailed bat.....	<i>Mystacina tuberculata</i>

silvereve	<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>
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>
South Island rifleman/titipounamu	<i>Acanthisitta chloris chloris</i>
South Island tomtit/miromiro	<i>Petroica macrocephala macrocephala</i>
spotted skink	<i>Oligosoma lineocellatum</i>
spur-winged plover	<i>Vanellus miles novaehollandiae</i>
starling*	<i>Sturnus vulgaris</i>
tahr*	see Himalayan tahr
torrentfish/piripiripohatu	<i>Cheimarrichthys fosteri</i>
tussock butterfly	<i>Argyrophenga</i> sp.
tussock ringlet	<i>Argyrophenga antipodum</i>
upland bully	<i>Gobiomorphus breviceps</i>
upland longjaw galaxias	<i>Galaxias prognathus</i>
welcome swallow	<i>Hirundo tahitica neoxena</i>
white-faced heron	<i>Ardea novaehollandiae novaehollandiae</i>
wrybill	<i>Anarhynchus frontalis</i>
yellowhammer*	<i>Emberiza cintrenella</i>

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