Toitu te whenua
Land Information
New Zealand

# Crown Pastoral Land Tenure Review

## Lease name : AWAPIRI STATION

## Lease number : PM 016

## 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.

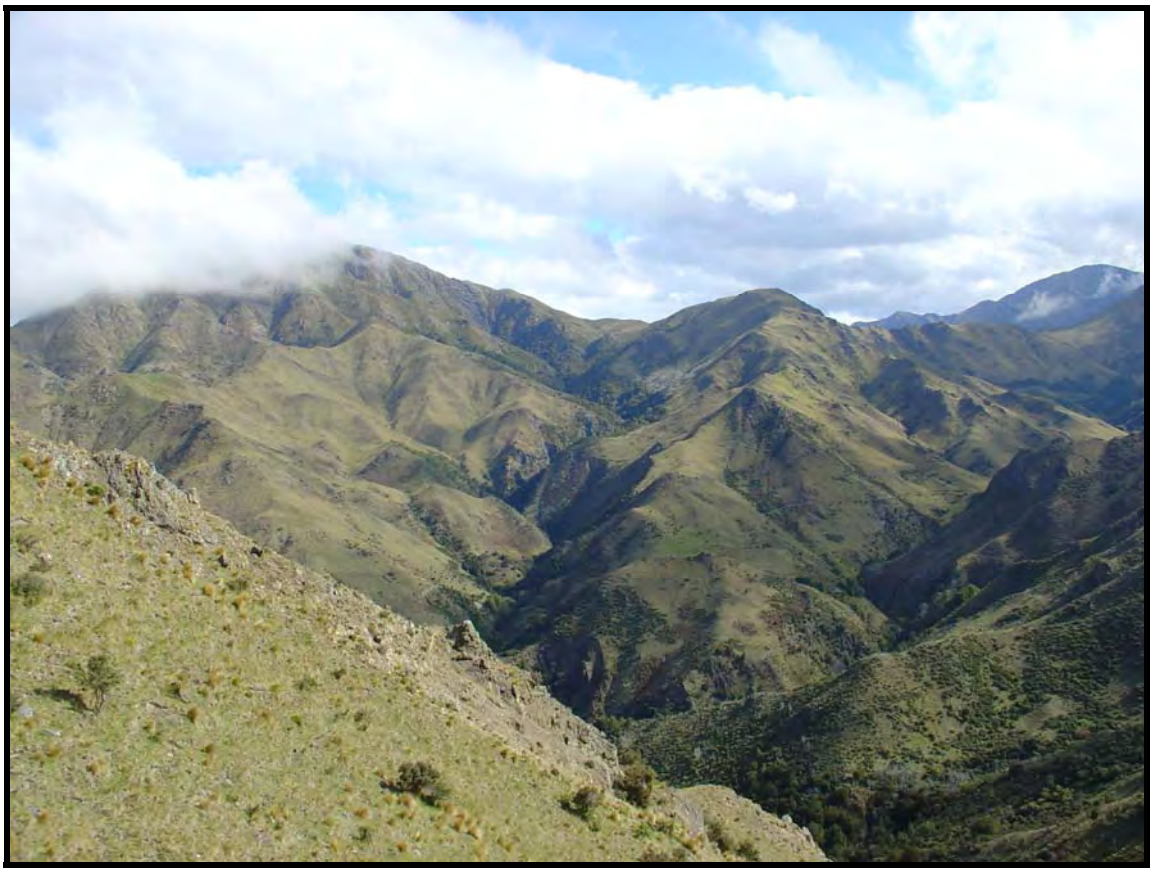
Note: Plans which form part of the Conservation Resources Report are published separately.

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

December 10

# AWAPIRI STATION

# PASTORAL LEASE



# CONSERVATION RESOURCES REPORT

## DEPARTMENT OF CONSERVATION

## OCTOBER 2010

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# PART 1 INTRODUCTION

Awapiri Station Pastoral Lease (hereafter called "the property") is leased by Graham and Beverlene Black. The property covers approximately 6880 hectares at the northern end of the Inland Kaikoura Range in South Marlborough. It mostly comprises steep broken country between the Awatere and Clarence rivers. The property ranges in altitude from approximately 400m at its northern corner in the Awatere valley to 1483m at Black Mount near the centre of the property. The property is drained by McRae, Jordan and Medway rivers, which are tributaries of the Awatere River, and Swale and Mead streams, which are tributaries of the Clarence River.

Awapiri Station Pastoral Lease lies predominantly in Medway Ecological District (ED), within Inland Marlborough Ecological Region (ER). The eastern edge of the property lies within George ED (Inland Marlborough ER) and the southern part of the property in Mead Stream catchment lies in Tapuaenuku ED, within Clarence ER (McEwen, 1987). These ecological districts have not been surveyed as part of the Protected Natural Areas Programme.

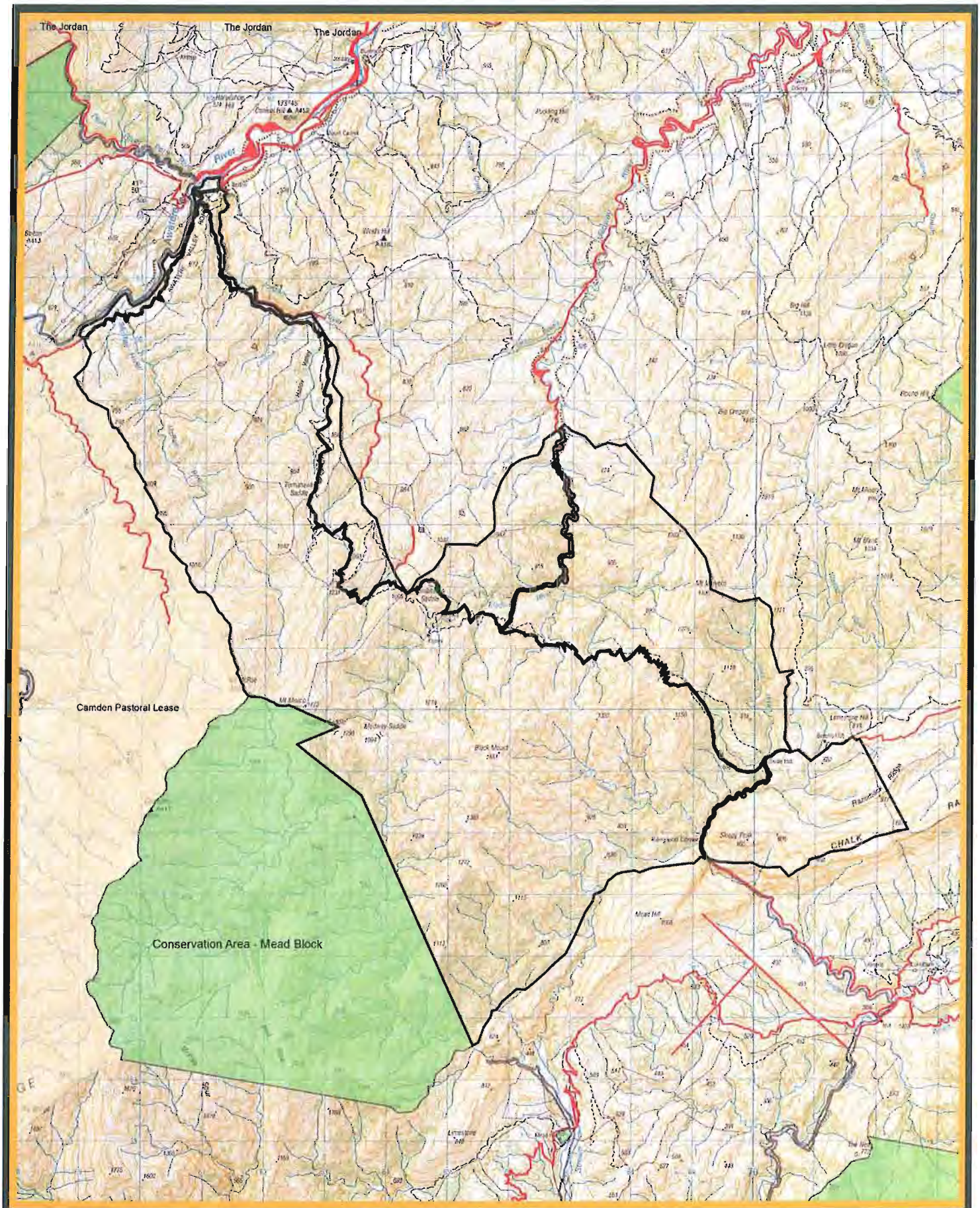
The property adjoins Mead Block Conservation Area to the south, Camden Pastoral Lease to the west, and privately-owned (freehold) land on all other boundaries. Access to the property is from Seddon via Awatere Valley Road. Unformed legal access to the property is delineated along the Medway River and Swale Stream, though neither provides practical access. A legal road bisects the property, following the approximate alignment of the vehicle track and pack track between the Awatere River and Swale Stream via Tomlinsons Saddle.

The tenure review inspection of the property was undertaken during November 2009 by a number of specialists. These specialists' reports (listed below) form the basis of this Conservation Resources Report.

- High Country Tenure Review Programme, Landscape Assessment, Awapiri Station Pastoral Lease. Blakely Wallace Associates. 19pp.
- Awapiri Station Vegetation Description. Mike Harding. 6pp.
- Vegetation Report for McRae, Mead and Happy valleys, Awapiri Station Pastoral Lease Tenure Review. Simon Moore. 12pp.
- Vegetation Report for Chalk Range (and Razorback), the Medway and the lower Jordan riparian zones. Jan Clayton-Greene. 13pp.
- Assessment of the Bird and Lizard Values of Awapiri Station Pastoral Lease, South Marlborough. Marieke Lettink, February 2010, 13pp.
- Awapiri Station Pastoral Lease, A Report on the Aquatic Fauna Surveys. Scott Bowie, May 2010, 14pp.
- Awapiri Station Pastoral Lease Tenure Review Survey: Invertebrates. Ian Millar. 19pp.
- Historical Assessment for Awapiri Station Pastoral Lease: Steve Bagley, May 2010, 29pp.

The information presented in these reports may have been reworded to ensure cohesion between the different specialist subjects.

Topo/Cadastral map




# Topography - Awapiri Station Pastoral Lease
# Conservation Resources Report 2010

Department of Conservation
*Te Papa Atawhai*

New Zealand Government

N
W E
S
3
Kilometres

**Legend**

- Awapiri Station Pastoral Lease
- Public Conservation Lands
- Legal road
- Adjacent Pastoral Leases

Base map - LINZ topographic series
Cadastre - LINZ February 2010

G:\GIS\Tenure_Review\Pastoral_Lease\Awapiri\Awapiri CRR Topo.mxd

Canterbury Conservancy - Tenure Review

8 October 2010

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

## 2.1 LANDSCAPE

### 2.1.1 Landscape Context

Awapiri Station Pastoral Lease extends from Awatere Valley Road across the northern end of the Inland Kaikoura Range to the Chalk Range. The northeast-oriented Inland Kaikoura Range separates the Awatere and Clarence valleys and is flanked by the parallel Seaward Kaikoura Range. The mountainous massif of Tapuaenuku (2885m) is the highest point of the Inland Kaikoura Range and is the dominant and crowning feature of the Awatere valley and Clarence area. The Seaward and Inland Kaikoura ranges are the highest mountains in New Zealand outside the Southern Alps and dominate the northeast South Island. The underlying basement rock is mostly greywacke and argillite. Tectonic movement, including mountain uplift from the Clarence and Awatere faults and massive folding and faulting, has been a major factor in the appearance of the land.

### 2.1.2 Landscape Description

For the purposes of this landscape assessment Awapiri Station Pastoral Lease is divided into six landscape units, reflecting areas of similar landscape character. For each landscape unit, landscape character is evaluated using the following criteria:

- Naturalness: the condition of the natural vegetation, patterns and processes and the degree of modification present
- Legibility: expressiveness: how obviously the landscape demonstrates its formative processes
- Aesthetic Factors: e.g. distinctiveness and coherence. Distinctiveness is the quality that makes a particular landscape visually striking; frequently this occurs when contrasting natural elements combine to form a distinctive and memorable visual pattern. Coherence is based on characteristics including intactness, unity, continuity, and compatibility (intrusions, alterations, disruptions tend to detract from coherence)
- Historic Factors: historically valued attributes in the context of a high country landscape
- Visibility: the visibility of the landscape from public vantage points

#### Awatere Faces, Flats and Gorge (LU1)

This unit comprises a narrow strip within the Awatere Valley approximately 2.5 km long. It extends from the Awatere River gorge and includes small terraces and flats on the true right of the Awatere River and the eastern slopes of the valley within the property. Awapiri Station homestead and farm buildings are located at the northern end of the unit and Awatere Valley Road bisects the unit.

The dominant feature of the unit is the Awatere gorge especially the steep sections with dramatic drops to the river. Remnant native shrubland is a memorable feature on the steep scarp faces. Small flats (the only flats on the property) occur adjacent to the river. A mixture of pasture and shrubland occurs on the flats. Patchy shrubland occurs on the sides of the valley and within watercourses. Both the McRae and Jordan rivers have substantial riparian vegetation including cabbage tree, kanuka,

tauhinu and grey shrubland species. The McRae River is cut down into a short, narrow slot-gorge before it joins the Awatere River. Shrubland on the river flats, riparian margins and scattered patches elsewhere contribute to inherent natural character and identity.

The combination of open pasture and shrubland is typical of the Awatere valley and contributes to the aesthetic and amenity values present. Plantings of deciduous trees, conifers and poplars are features associated with the homestead and farm buildings. Pine trees are established on the face above and south of the homestead and wildings have spread into the lower Jordan valley.

Visual Values
The combination of the river environment, distribution of shrubland, open farmland and cultural plantings form a visually pleasing working landscape and contribute to the visual resource values along Awatere Valley Road. The McRae River gorge and shrublands form an impressive landscape feature.

Landscape Vulnerability
The unit overall is highly modified, however the native shrublands are a significant and important landscape feature, especially those associated with the river gorge and watercourses. The shrubland is vulnerable to removal by farm development. Threats include:

- wilding pine spread
- burning/removal of native shrublands
- feral animal damage

Evaluation

| **Criteria** | **Value** | **Comment** |
|---|---|---|
| naturalness | low overall | Riparian vegetation within the Awatere River gorge and valley is significant. |
| legibility | medium | |
| aesthetic factors | medium to high | Shrubland/ pasture/cultural plantings and buildings set in an impressive river gorge contribute to a high quality landscape. |
| visibility | high | Visible from Awatere Valley Road. |

## McRae River (LU2)

This unit comprises the McRae River catchment. It extends up to the ridge on both sides of the river valley and to Mt McRae and Mt Monro to the south. Landform and vegetation patterns are typical of hill country of the east side of the Awatere valley. These consist of moderately steep, dissected V-shaped valleys, over-sown and top-dressed and supporting a shrubland/pasture/short tussock/bracken mix. There are significant areas of shrubland especially on shady faces and along watercourses. Isolated wilding pines occur on ridges. In general, more shrubland occurs on the northeast faces. The sunny faces are subject to drying northwest winds and greater grazing pressure and are more modified and open. Pig rooting was observed in the small valley west of Tomahawk Saddle.

Visual Values
Visual values across the unit are assessed as average. The majority of the unit is not visible from Awatere Valley Road. The shrublands which are visible close to the road in LU1 contribute to the natural character and continuity of this unit. Parts of the unit are visible as foreground to the range tops and peaks beyond. The view up the side valleys from Awatere Valley Road to the ranges is a feature.

Landscape Vulnerability
Below approximately 1000m has been over-sown and top-dressed and appears as hill country farmland. Removal of remnant shrubland through more intensive land use is assessed as the most significant threat. Threats include:

- wilding tree spread
- burning
- feral animal damage
- unsympathetic earthworks

Evaluation

| Criteria | Value | Comment |
|---|---|---|
| naturalness | low to medium | Generally reasonably modified. |
| legibility | medium | |
| aesthetic factors | medium | Not striking or visually distinctive but typical of hill country in the Awatere valley. Existing shrubland contributes to amenity and aesthetic values. |
| visibility | medium | Parts are visible from the Awatere Valley Road and as foreground to the ranges and peaks beyond. |

## Jordan Hills (LU3)

This unit encompasses the Jordan River catchment and comprises north and northeast-facing tributaries of the Jordan River which form a sequence of short valleys, including Lookout Stream and Happy Valley. The landform is moderately steep with dissected valleys. Vegetation patterns include significant patches of shrubland within a pasture/short tussock mix. Riparian vegetation along the Jordan River below the vehicle track is a feature. Riparian shrubland is also present along the margins of other watercourses. Wilding pines have spread from the homestead area along the Jordan River with scattered seedlings elsewhere.

Lookout Stream is flanked on its west side by a steep rocky face with a fairly distinctive triangular shaped, sharp-pointed peak forming a local landmark. Small flats and fans occur along Jordan River and at the confluence of the side streams. Patchy shrubland interspersed with pasture is the predominant vegetation pattern.

Southeast towards Tomlinsons Saddle the gullies tend to be steeper and more entrenched with a greater distribution of shrubland, mountain ribbonwood, whararikі, kanuka, tauhinu, tussock and bracken. Rocky bluffs and tors are also a feature. As on most of the western part of the property a few scattered wilding conifers occur.

Overall, the Jordan catchment is quite modified. The majority has been over-sown and top-dressed and has the appearance of hill country farmland. However there are also significant areas of remnant shrubland and scrub which contribute to the character of the unit. Riparian vegetation along the Jordan River, below the vehicle track, is a feature.

Visual Values
The unit is typical of hill country in the foothills of the Inland Kaikoura Range. It is not notably distinctive or impressive but is attractive farmland, especially the mix of indigenous vegetation and open grassland, bluffs and tors. It is not visible from any public place.

Landscape Vulnerability

The most likely threat is from farm development or more intensive land use which would affect remnant shrublands. Threats include:

- wilding tree spread
- burning
- feral animal damage
- unsympathetic earthworks

Evaluation

| Criteria | Value | Comment |
|---|---|---|
| naturalness | low to medium | Modified but with significant shrubland areas within pasture. |
| legibility | low to medium | Formative processes are expressed in the appearance of the landscape but are not dominant. |
| aesthetic factors | medium | Not striking or visually impressive but forms a coherent reasonably attractive landscape. |
| visibility | low | Not visible from public places. |

## Medway (LU4)

This unit comprises the headwaters of the Medway River, which flows north to join the Awatere River. It is tucked within surrounding foothills and mountains of the Inland Kaikoura Range. The unit is highly diverse with a wide altitudinal range (less than 650m on the northern end to 1480m at Black Mount) and variable topography and vegetative cover.

It contains a varied mix of rugged hill and mountain slopes and deeply incised water courses. Part of the area is quite modified with extensive low-producing pasture on steep hill slopes but also with a high distribution of indigenous shrubs and forest. The lower (northern) portion of the Medway catchment is the most modified with predominantly developed pasture and scattered scrub. Hawkweed*[1] is a significant component especially in areas that have not been over-sown or top-dressed.

In contrast, other areas of the upper Medway River are either deeply incised gorgy areas with very rugged rocky spurs, or steep faces and bluffs, such as below Black Mount. On low- and mid-altitude slopes, these areas support associated native tree and shrub cover including beech forest and kanuka shrubland. The forest and shrub cover appears to have been buffered from burning and grazing due to steep terrain. The appearance of the land is a mix of significant areas of native forest and shrubland and developed farmland. High altitude areas are dominated by weathered rock ridges and bluffs, shattered rock pavements and extensive scree.

Flynns Hut is located beside the Medway River. It is accessed via a steep vehicle track that drops down from Tomlinsons Saddle through tussock and pasture on steep slopes with distinctive craggy rock bluffs near the saddle. The track then passes through pockets of beech forest. Two Lombardy poplar* trees mark the site of the hut. An older disused hut (referred to as Flynns Whare) is located further downstream. The vehicle track terminates approximately a kilometre or so beyond the hut.

Visual Values

Visual values of the Medway Unit are associated with the steep rugged and varied topography, i.e. deeply incised watercourses, steep rugged and rocky slopes and bluffs together with quite extensive forest and shrubland communities and the impressive mountain tops that surround and contain them.

[1] Naturalized (introduced) species are indicated with an asterisk*.

Landscape Vulnerability
This unit is vulnerable to land use changes that would threaten remaining indigenous cover, in particular fire. Threats include:

- wilding tree spread
- burning
- feral animal damage
- inappropriate and unsympathetic earthworks

Evaluation

| Criteria | Value | Comment |
|---|---|---|
| naturalness | medium | Low on hill slopes and lower slopes. High on steep rocky slopes, bluffs and gorge areas. |
| legibility | medium | Incised watercourses are very legible. |
| aesthetic factors | medium | Overall medium. Forest and shrub areas associated with watercourses and steep rocky slopes are visually striking and impressive. |
| visibility | low | Not visible from public places. |

## Mead/Swale (LU5)

This distinctive part of the property comprises predominantly steep southeast-facing mountain slopes with extensive rock bluffs and screes at all altitudes. It also includes a wide altitudinal range extending from approximately 600m to 1480m at Black Mount.

Vegetative patterns include extensive alpine herbfield and fellfield above the bushline, broken by scree and rock bluffs. Below the alpine herbfield and fellfield is an extensive area of forest and shrubland (mountain beech, mountain totara and regenerating kanuka). In the lower valleys diverse and regenerating mixed shrubland is present with some open grass areas, scattered short tussock and hawkweed*. The most intact forest is in the upper Swale catchment.

The area engenders a feeling of remoteness and wildness.

Visual Values
The Mead/Swale mountain slopes have high visual and scenic values due to the rugged mountain slopes, highly impressive and diverse vegetation types and scree slopes. The high degree of naturalness contributes to high visual and scenic values. It is visually distinctive and striking with a high level of coherence.

Landscape Vulnerability
The steep nature of this unit has no doubt protected it from burning and grazing. It is however inherently fragile and vulnerable to any human disturbance or grazing by wild animals.

Evaluation

| Criteria | Value | Comment |
|---|---|---|
| naturalness | high | All natural patterns and processes are intact. |
| legibility | high | Formative processes highly legible. |
| aesthetic factors | high | Visually distinctive and coherent. No discordant elements. |
| visibility | low | Remote from public places. Visible from air (commercial flight path). |

## Chalk Range (LU6)

The southeast corner of the property extends onto part of the Chalk Range. This area represents a unique landscape which includes highly distinctive landforms, limestone pavements and bluffs. The limestone imparts a characteristic white appearance to the underlying bedrock in some areas (reflected in the name Chalk Range) with grey rock faces and bluffs in other areas, including high perpendicular cliffs such as on Razorback Ridge and Sleepy Peak.

Vegetation is variable and includes a mix of regenerating riparian shrubland confined to mainly steeper slopes and gorges. Swale Stream is notable for the extent of regenerating shrubland. Elsewhere is a mix of low scrub, scattered short tussock and grassland. Unlike the Mead and Swale mountain slopes the Chalk Range is quite modified, apart from the significant shrublands referred to above. The mix of shrubland and open grassland however forms a visually satisfying landscape with a high degree of coherence.

Visual Values

The Chalk Range limestone belt has striking and distinctive landforms which are highly memorable and are a well known feature of the Clarence River side of the Inland Kaikoura Range. The chalky appearance and unusual and strange landforms such as Razorback Ridge, Sleepy Peak and others contrast with surrounding landforms and have to be regarded as an outstanding landscape feature.

Substantial shrubland hugging gorges and clinging to precipitous slopes adds to the visual and scenic values. Elsewhere the mix of shrubland and pasture, back dropped by Razorback Ridge and the Chalk Range, is visually very impressive and distinctive.

Landscape Vulnerability

The Chalk Range landscape values are derived first and foremost from the outstanding landforms and geology of the area combined with regenerating shrubland. Threats include:

- more intensive grazing or farm development
- burning
- wilding tree spread
- feral animal damage
- unsympathetic earthworks or structures

Evaluation

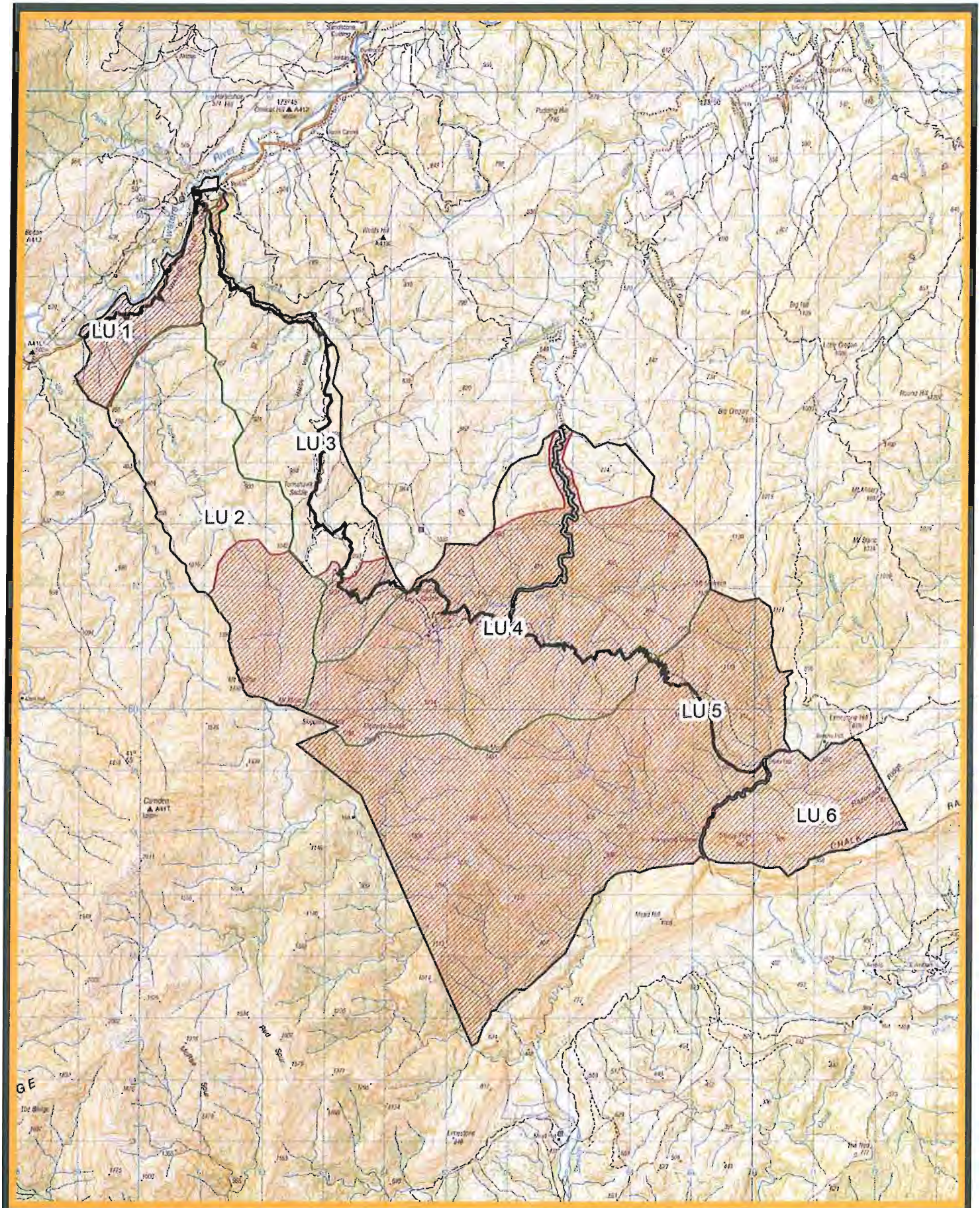
| Criteria | Value | Comment |
|---|---|---|
| naturalness | medium | Variable. Large areas of shrubland on steeper slopes and riparian areas but also mixed with low scrub, scattered short tussock and exotic grass on easier slopes. |
| legibility | high | Landforms are highly expressive of formative processes. |
| aesthetic factors | high | Visually striking and distinctive. |
| visibility | low | Not visible from frequently used public places. |

## Significance of Landscape Values

The high altitude summit range (above 1100m) from Mt McRae to Mt Malvern and the adjacent Mead and Swale mountain slopes have high inherent landscape values. All natural processes, characteristics and features are present. The mountain range is integral to the Inland Kaikoura Range mountain landscape. The distinct limestone landscape of the Chalk Range and Razorback Ridge are outstanding and well know landscape features.

The rugged hill slopes and indigenous forest and shrubland of the Medway catchment are significant to the natural character of the property and have inherent landscape values. Riparian shrubland along the lower Medway and Jordan rivers riparian margin are important landscape features. Shrubland on the Awatere valley faces and river corridor contributes to the appreciation and experience of the Awatere valley.

# Landscape Values Map




# Landscape Values - Awapiri Station Pastoral Lease
# Conservation Resources Report 2010

Department of Conservation
*Te Papa Atawbai*

New Zealand Government

N
W E
S

3
Kilometres

**Legend**

- Awapiri Station Pastoral Lease
- Awapiri Station Landscape Units
- Awapiri Station Landscape Values

Base map - LINZ topographic series
Cadastre - LINZ February 2010

G:\GIS\Tenure_Review\Pastoral_Lease\Awapiri\Awapiri CRR Landscape Values.mxd Canterbury Conservancy - Tenure Review 8 October 2010

## 2.2 GEOLOGY, LANDFORMS AND SOILS

### 2.2.1 Geology

Awapiri Station Pastoral Lease is extensively underlain by early Cretaceous rocks, comprising well-bedded sandstones and mudstones and poorly-bedded sandstones of the Pahau Terrane. These are collectively referred to as greywacke. Within this geology occur volcanic dikes originating from the "Tapuaenuku" igneous complex, of probable Mid-Late Cretaceous age. Igneous dikes appear to be responsible for the distinctively dark rock near the summit of Black Mount. At its southernmost end, the property extends onto Tertiary sedimentary rocks: Eocene Amuri Limestone, Oligocene Motunau Group limestone and Miocene Waima Formation of calcareous mudstone with conglomerate lenses. The limestones underlie the Chalk Range, Sleepy Peak, some narrow spurs southwest of Mead Hill and the limestone country east of Swale Hut. Conglomerate of the Waima Formation forms the prominent Razorback Ridge. Waima Formation underlies the small valley northwest of and parallel to Razorback Ridge and a band of country in the upper branches of Mead Stream, west and southwest of Mead Hill (Rattenbury *et al*, 1998).

Overlying these geologies is a scattering of Pleistocene alluvial fan and terrace deposits and till, mainly confined to valley floors and lower slopes.

The main structural features within and near to the property are the active Awatere and Clarence faults. These are two of the four major dextral strike-slip faults (the others being the Wairau and Hope faults) that strongly influence geology and geomorphology in the South Marlborough-North Canterbury region. These major faults are involved in stress release from the oblique continent-continent convergence between the Pacific and Indo-Australian Plates which has resulted in the elevation of the Southern Alps and the separation of Nelson from Otago.

The Awatere Fault lies about two kilometres northwest of the property, along the northwest slopes of the Awatere valley. The Clarence Fault passes through the property near its southeast edge, separating the greywacke from the Tertiary sediments near the property boundary. It lies along or adjacent to the mid reaches of Swale Stream, from Kangaroo Corner to a few hundred metres downstream of Swale Hut.

Older faults are discernible in different parts of the property. In the southeast corner, alternating bands of limestones and Waima Formation appear to have been brought into their current juxtaposition by past faulting, considered now to be inactive.

### 2.2.2 Landforms

The property lies at the northeast end of the Inland Kaikoura Range. Active uplift of this range has formed the steep mountain ridges, incised valleys and mostly narrow alluvial flats which typify the property. The deeply incised Jordan and Medway rivers within the wider characteristic of the steep mountain and hill-slopes are prime examples of this process, and are characteristic of the northeastern end of the pastoral lease. Immediately northwest of the property this physiography gives way to broad valleys with preserved river terraces typical of the central and lower Awatere valley, suggesting lesser rates of uplift. Immediately south and east of the property faster uplift rates have led to the significantly higher altitudes of the main peaks of the Inland Kaikoura Range. The property therefore lies in an area of intermediate uplift in which its southern section is less influenced by the rain shadow effect of the Inland Kaikoura Range than the adjacent Mead Conservation Area to the southeast.

Along the southeast edge of the property the physiography changes markedly at the Clarence Fault. The fault marks the edge of the steep northwest limb of the Ben More Anticline, where the Tertiary

sediments dip northwest at angles of 50º or more. Within these sediments, the limestone and conglomerate are relatively resistant to erosion compared with some interbedded sediments and the underlying Cretaceous rocks to the southeast. The limestone of the Chalk Range, rising steeply to the southeast, has been undercut by erosion of the Cretaceous rocks on its southeast side, leading to collapse and escarpment formation. The result is a striking, asymmetrical homoclinal ridge with a steep bedding plane dip slope on one side and steeper escarpment and talus slope on the other. Razorback Ridge and Sleepy Peak are also homoclinal ridges. So steep are the dip slopes along these three ridges that in places they approach the symmetry of hogback ridges.

On the dip slope side of the Chalk Range, streams have formed across the strike of the limestone bedding planes in some places. The streams erode down dip, rather than vertically, forming escarpments against overlying beds of limestone or conglomerate. The tributary of Swale Stream running across the strike of the Chalk Range in the southeast corner of the property has formed the parallel conglomerate escarpment of Razorback Ridge. Here, both stream and escarpment are slowly retreating down the dip of the underlying limestone. This process of streams forming along the strike of resistant sediments, leading to parallel down-dip retreat of both streams and the escarpments they form, appears to have been repeated several times at lesser scales northwest from Razorback Ridge, although faulting may have played a part here also.

The streams formed behind the Chalk Range and associated ridges cut through them toward the Clarence valley in deep gorges such as that between Sleepy Peak and Mead Hill. The positions and courses of the gorges are assumed to have been superimposed on or antecedent to the homoclinal ridges from a pre-existing drainage.

### 2.2.3 Soils

Higher altitude parts of the property on the mountain ranges have poorly-developed shallow soils along the summits and steepland soils on the upper slopes. Mid-altitude slopes mostly have shallow hill country soils. Recent alluvium along rivers and streams has sandy loams.

**Significance of Geology, Landforms and Soils**

The geology of Awapiri Station Pastoral Lease is complex and interesting. The property spans a diverse range of geologies and landforms. High rates of uplift, extensive faulting and prominent landforms, contribute to the significance of the landforms. Notable features are the prominent summits of Mt Monro, Black Mount and Mt Malvern, the deeply incised Jordan and Medway rivers, the spectacular summits and scarps of Razorback Ridge and the Chalk Range, and gorges of Swale and Mead streams.

## 2.3 CLIMATE

Awapiri Station Pastoral Lease lies partly within the rain-shadow of the Inland Kaikoura Range. It has a relatively dry inland climate, with relatively high sunshine hours. The area experiences a wide temperature range between summer and winter. Snow may lie at higher altitudes for several weeks during winter. Winds are predominantly from the northwest, with occasional south or southwest winds. Average annual precipitation is probably between 600 and 1200 mm (Tomlinson, 1976).

## 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 land environments by Leathwick *et al.* (2003), aim to "identify areas of land having similar environmental conditions regardless of where they occur in New Zealand." Therefore "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.

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 1) has become the recognised benchmark for the promotion of threatened LENZ conservation.

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

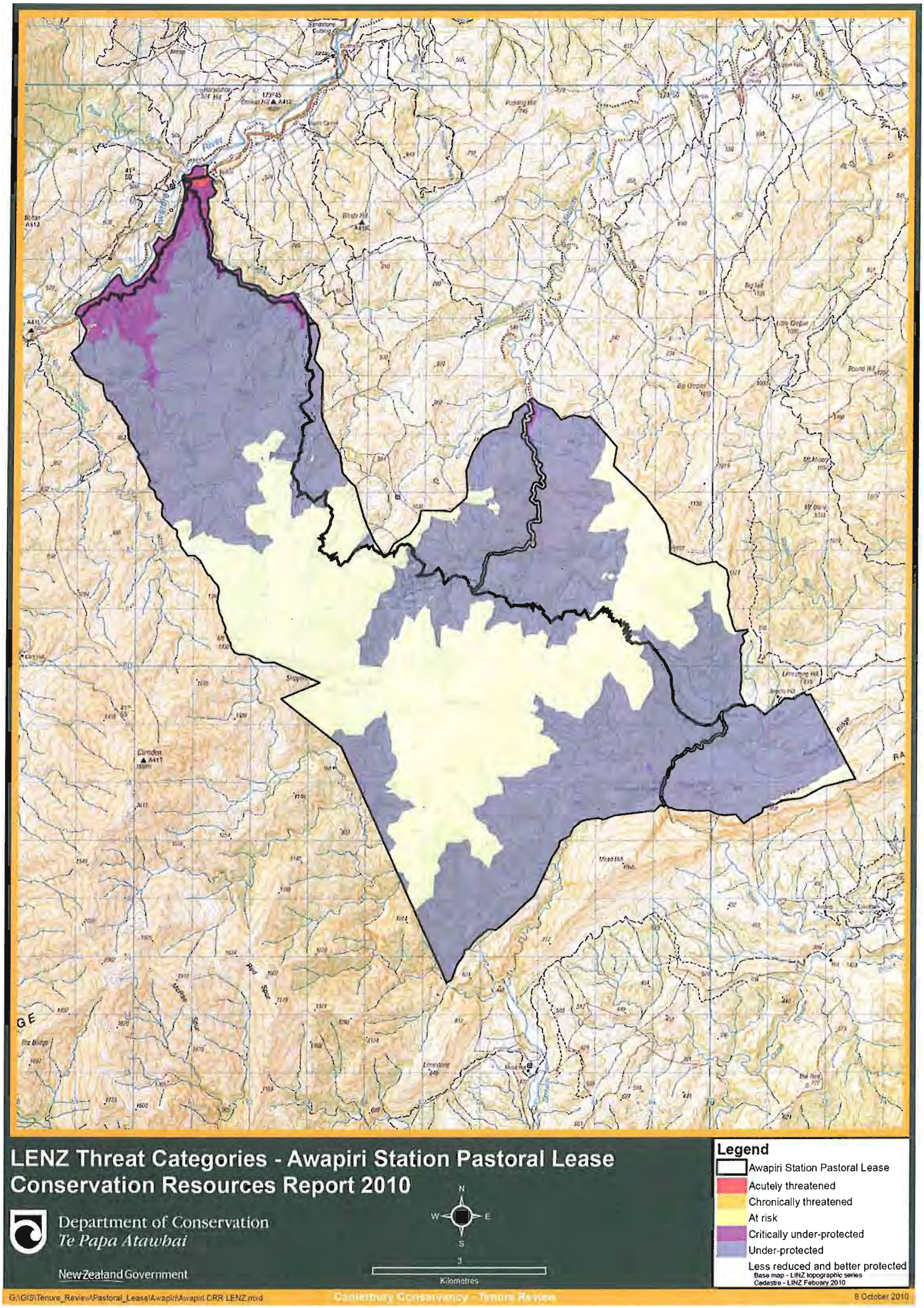
| Category | Criterion |
|---|---|
| Acutely threatened | <10% indigenous cover remaining |
| Chronically threatened | 10-20% indigenous cover remaining |
| At risk | 20-30% indigenous cover remaining |
| Critically under-protected | >30% indigenous cover remaining<br><10% legally protected |
| Under-protected | >30% indigenous cover remaining<br>10-20% legally protected |
| Less reduced and better protected | >30% indigenous cover remaining<br>>20% legally protected |

On Awapiri Station Pastoral Lease, one small area of river terrace at the northern corner of the property in the Awatere valley lies within an "acutely threatened" land environment; however, the vegetation communities of this area have all been highly modified. Other low-altitude areas in the Medway, McRae, Jordan and Awatere valleys lie in a "critically under-protected" land environment; these also have generally highly modified vegetation communities with the exception of some terrace risers which retain their shrublands. Mid-altitude parts of the property (up to approximately 1000m altitude) lie within "under-protected" land environments. All other high altitude parts of the property lie within "less reduced and better protected" land environments.

### Significance of Land Environments

Small lower-altitude parts of the property on recent alluvium lie within an acutely-threatened land environment; this area has been highly modified. Remaining parts of the property lie within critically under-protected, under-protected or less reduced/better protected land environments.

LENZ Threat Map



# 2.5 VEGETATION

## 2.5.1 Ecological Context

Ecological Districts

Awapiri Station Pastoral Lease spans two ecological regions (Inland Marlborough and Clarence), and four ecological districts (George, Medway, Tapuaenuku and Waihopai). However the definition of these boundaries has only ever been defined at 1:500,000 (McEwen, 1987). There has been no formal definition at the scale required for this type of survey work (i.e. 1:50,000). This has necessitated an examination of where the logical boundaries may lie. A suggested definition is that the limestone belt in the southeast of the property lies in George ED, the McRae River catchment in the northwest of the property lies in Tapuaenuku ED and the remainder of the property lies in Medway ED.

There are no published reports available which describe the property under the Protected Natural Areas Programme (PNAP) or any other survey. There is an unpublished draft report which was a collation exercise for the PNAP for Inland Marlborough ER (Clare, 1990) but the scope of this report was limited. There are also some unpublished plant lists compiled, and Allan Herbarium (CHR) specimen collected by a number of botanists across different parts of South Marlborough, some of which occur on or adjacent to this pastoral lease.

Existing Vegetation

The part of the property which lies in George ED contains the limestone belt in the east of the property, under the ecological district boundary definitions proposed above. The vegetation on the limestone is characterised by short tussockland, rank pasture grassland, loamfield, rockland and herbfield, with occasional shrubland, scrub or forest. There is typically a significant exotic component, particularly on the gentler gradients which have been subject to the removal of native woody cover and over-sown.

The parts of the property in Medway ED consist of: mountain beech forest remnants in the upper headwaters of Medway River; secondary montane mixed broadleaved forest (sometimes with mountain beech) on lower hill slopes and riparian zones; mixed shrubland-tussockland and pasture grassland on mid-slopes and gentle gradients; scree, bluff, rockland and loamfield communities on steeplands; subalpine shrubland, tussockland, herbfield and rockland on and around the higher altitude peaks.

McRae River catchment lies in Tapuaenuku ED and is characterised by: secondary and induced mixed shrubland, scrub and forest communities on south-facing slopes and riparian zones; short tussockland and rank pasture grassland below 1000m; mixed tussockland and shrubland-tussockland above 1000m; bracken fernland on north-facing slopes; rock bluff communities and riparian cliff communities.

Within the matrices of the vegetation patterns described above there are small vestiges of rare and unusual communities. Introduced hawkweed species of mouse-ear hawkweed*, *Hieracium caespitosum** and *H. lepidulum** are widespread over the property.

Historic Vegetation Patterns

Pre-human vegetation below tree line is likely to have been a mosaic of beech forest and mountain totara-kapuka forest in the dry Clarence ER (Courtney and Arand, 1994). The valley floors may have contained a high component of matai in the Awatere catchment (McGlone and Basher, 1995), doubtless along with lower elevation mixed broadleaved species, many of which remain. At higher elevations, mountain inaka would have been a key component of subalpine shrublands. However, fire caused widespread vegetation change, as described by McGlone and Basher (1995):

*'…Widespread fire broke out in the early Polynesian era and between 750 and 600 years B.P. the Awatere catchment lost most of its forest cover, which was replaced by bracken, grass and scrub. There was a slight recovery of forest and scrub after 600 years B.P. when burning frequency lessened. Increased burning, grazing and introduction of exotic weeds accompanied the penetration of the region by European pastoralists in the 1860's. The post-1960 era is clearly indicated by the upsurge of Echium vulgare and Pinus spp.'*

## 2.5.2 Vegetation and Flora

The property is divided into six main areas for this description of the vegetation.

### McRae Valley

The patterns of vegetation here, which are reflected through the rest of the property, show that there is a trend towards increasing naturalness and intactness of the vegetation communities from valley floor to ridge top and also from the lower ends of the valley to the higher altitude headwaters. There is also a clear pattern relating to aspect in that woody indigenous vegetation occurs on steep south-facing slopes, gullies and riparian zones.

This area includes the entire catchment of the McRae River and extends right down to the Awatere River.

The main vegetation communities are:

- Mountain inaka shrubland on upper spur side slopes and ridges
- Midribbed snow-tussockland on spur ridges and side slopes
- Bedrock outcrop communities
- Herbfield, gravelfield and loamfield
- Bracken fernland on spur side slopes
- *Carex secta* sedgeland in seeps on valley floors
- Matagouri shrubland on spur side slopes
- Mountain ribbonwood treeland in gullies
- Kanuka-manuka shrubland, scrub and low forest in gullies, spur side slopes and riparian zones
- Kanuka-mixed broadleaved forest, scrub and shrubland on spur side slopes
- Mixed shrubland, scrub and low forest in gullies, spur side slopes and riparian zones
- Mixed exotic-hard tussock grassland on spur side slopes, ridges, valley floors and terraces

The west-facing spur slopes at the headwaters of McRae River support a relatively diverse community dominated by mid-ribbed snow-tussock, whatariki and carpet grass. Other species include *Carmichaelia corrugata, Celmisia monroi,* mountain inaka, *Acrothamnus colensoi* and patotara. Despite an abundance of bare loam these communities are relatively intact. North and east-facing slopes are more depauperate, with the key species being midribbed snow-tussock, whatariki, golden speargrass, mountain tauhinu and *Helichrysum intermedium*. One gully system supports a small stand of mountain ribbonwood.

Just beyond tree line (approximately 1200m altitude) mountain inaka dominates subalpine shrubland communities. Associate species include mountain tauhinu and golden speargrass.

Mixed shrublands below 1000m are relatively common throughout the McRae River valley system. They are induced communities resulting from burning and consist of matagouri, mountain tauhinu, *Coprosma propinqua,* whatariki, porcupine shrub, hard tussock and a host of exotic species. Minor associate species include *Olearia cymbifolia, O. odorata, Carmichaelia australis* and pink broom.

Scree communities are relatively uncommon, being confined to colluvium below bluffs and a few high-altitude steeplands. The most common scree species below 1000m are *Anisotome filifolia, Epilobium melanocaulon, Clematis* sp., viper's bugloss* and *Hieracium lepidulum**

Bluff vegetation below 1000m typically includes Marlborough rock daisy, *Brachyglottis monroi, Epilobium brevipes* (naturally uncommon), *E. crassum?, Heliohebe hulkeana* subsp. *hulkeana, Gingidia montana,* prostrate kowhai, pink broom, matagouri, *Hebe traversii, Polystichum oculatum, Cheilanthes sieberi* subsp. *sieberi* and scrub pohuehue.

Bracken fernland occurs primarily on dry, sunny, north and east-facing slopes below 1000m. Common associate species include *Coprosma propinqua,* sweet brier*, lawyer and *Carmichaelia australis.*

The composition and intactness of kanuka-manuka shrubland, scrub and low forest is dependent on age, drainage, burning/over-sowing history and abundance of stock and wild animals. Older stands tend to have a broadleaved component and are often in a transitional stage to broadleaved forest communities. The common associates are kapuka, akiraho, five-finger (below 700m), lancewood and mountain ribbonwood. Where the understorey is relatively intact the most common species include mountain wineberry, *Coprosma crassifolia, C. rhamnoides, Polystichum richardii, Uncinia leptostachya, Corokia cotoneaster* (margins), *Hebe traversii* and wall lettuce*.

Riparian shrublands in the splash zone immediately adjacent to the main stem of McRae River contain a mosaic of vegetation types. Toetoe, tutu, cabbage tree, manuka, *Hieracium lepidulum**, *Anaphaloides bellidioides,* white clover*, prickly shield fern, *Carex secta* (localised) and bidibid are prominent species.

*Carex secta* occurs in small modified seeps and depressions with manuka, swamp kiokio, *Epilobium nerteroides,* and toetoe but the intertussock spaces are dominated by introduced grasses and herbs grazed and trampled by stock.

Over-sowing in combination with burning has meant that exotic pasture species dominate the flats and gentler slopes below approximately 1000m altitude and are particularly dominant in the front country between 400 and 700m altitude; although remnant kanuka-manuka shrubland still occurs, particularly on terrace risers above the Awatere River with some regeneration out on to the river flats.

Notable Flora

A threatened native daphne, *Pimelea aridula* 'South Marlborough', was collected from a rock bluff on the east facing slopes in the mid part of the valley. This species is classified as 'nationally critical', the highest possible threat ranking. An 'at-risk; naturally uncommon' species, *Epilobium brevipes,* occurs on rock outcrops. Pink broom, a South Marlborough endemic, is present on bluff communities in the McRae River riparian zones. This species does not feature on the national threat rankings but is a South Marlborough endemic with a distribution generally restricted to south of the Awatere Fault. Other South Marlborough endemics present include Marlborough rock daisy, *Brachyglottis monroi* var. *monroi* and *Heliohebe* sp. *Dracophyllum filifolium* was only seen once during the survey in riparian forest beside the main stem of McRae River. This species is uncommon in southeast Marlborough.

An *Epilobium* specimen collected from a rock outcrop has been tentatively identified as *E. crassum* which is thought to be at or close to its northeast limit (Cathy Jones, *pers. comm.*).

Plant and Animal Pests

Sheep* are present throughout the valley system though tend to be more concentrated at the bottom end of the valley. Pigs*, goats* and hares* are present with localised browsing evident particularly on palatable species such as *Gingidia montana.* A few scattered pine trees* were observed in the

catchment but there was no evidence that these are causing wilding spread. Mouse-ear hawkweed*, *Hieracium caespitosum** and *H. lepidulum** are all common in the valley. No major woody weed problems were observed.

## Jordan Valley

This area includes all of the Jordan River catchment on Awapiri Station Pastoral Lease.

The main vegetation communities present are:

- Kanuka-mixed broadleaved forest in riparian zones
- Bluff and rock communities
- Matagouri-tauhinu-shrubland-pasture grassland on hill slopes and riparian zones
- Kanuka and kanuka-kohuhu low forest and scrub on south-facing hill slopes, lower hill slopes and riparian zones
- *Carex secta* sedgeland at seeps
- Bracken fernland on hill slopes
- Hard tussockland on upper-valley slopes
- Mixed exotic grassland on lower-valley hill slopes
- Flaxland-shrubland on damper upper-valley slopes
- Rushland-sedgeland in upper-valley seepages

In the lower Jordan valley, remnants of forest consisting of kanuka, cabbage tree, and kohuhu persist on the steeper riparian banks, but on many gentler slopes this forest gives way to a mixture of bracken fernland, mixed exotic grassland, hard tussock and a matagouri-sweet brier*-tauhinu scrubland. *Rubus* sp. and *Coprosma propinqua* are common within this scrub with *Melicytus* sp. and *Clematis afoliata* also present. Marlborough rock daisy and, locally, whahariki, are common on the riparian bluffs.

The main valley sides support grassland with scattered hard tussock and patches of shrubland and trees. Woody species present are kanuka, kohuhu, *Coprosma propinqua*, tauhinu, kapuka, *Brachyglottis monroi*, porcupine shrub, mountain wineberry, *Carmichaelia australis*, *Olearia cymbifolia* and *Hebe* sp.

Grassland communities at lower altitudes, near the stream, are dominated by blue tussock, hard tussock, pasture grasses*, *Leucopogon suaveolens* and hawkweed*. Other species present are golden speargrass, *Blechnum penna-marina*, *Pimelea* aff. *oreophila* and scattered *Coprosma propinqua* and tauhinu.

Denser cover is present alongside the main stream. This is dominated by toetoe, tauhinu and *Coprosma propinqua*. Other species present are tutu, whahariki, manuka, mountain ribbonwood, matagouri, *Aciphylla glaucescens*, *Coriaria kingiana*, *Coprosma tayloriae*, bracken, prickly shield fern, scrub pohuehue and hard tussock. Rocky areas alongside the stream support Marlborough rock daisy, *Helichrysum parvifolium*, *Brachyglottis monroi*, *Brachyglottis lagopus*, kohuhu, tauhinu, *Gingidia montana*, *Carmichaelia australis* and *Polystichum richardii*.

An upper tributary of Jordan River, just northwest of Tomlinsons Saddle, supports indigenous vegetation with inherent values. This is above the area that receives oversowing and top-dressing, which is demarcated by the ridge fenceline midway between Tomahawk and Tomlinson saddles.

Within Happy Valley, the kanuka-kohuhu forest remnant contains occasional cabbage tree, akiraho, *Helichrysum lanceolatum* and *Polystichum richardii,* though the understorey has been heavily modified and comprises largely bare ground. Weeping broom (nationally endangered) has previously been recorded from this general vicinity by Tony Druce (Allan Herbarium (CHR) specimen); though none were found during the survey.

The remainder and overwhelming majority of the Happy Valley catchment contains either rank pasture grass or shrubland-grassland. Prominent native species include matagouri, tauhinu, silver tussock and hard tussock.

Seepages supporting wetland vegetation are relatively common on lower slopes and terraces. Dominant species are *Carex secta*, *Juncus edgariae* and bog rush. Other species commonly present are *Aciphylla glaucescens*, toetoe, jointed rush*, red woodrush, Yorkshire fog*, *Blechnum penna-marina*, white clover*, *Hydrocotyle heteromeria*, native violet, *Ranunculus acris**, *Ranunculus glabrifolius* and *Azola filiculoides*.

A depauperate *Carex secta* sedgeland in Happy Valley contains remnant plants up to 1.5m tall. There are few native wetland species remaining between these plants.

A flaxland/shrubland community is present on rubble on lower slopes. This community is dominated by whaririki and *Coprosma propinqua*. Also present are tauhinu, *Carmichaelia australis*, *Brachyglottis monroi* and manuka, with emergent young kohuhu, mountain ribbonwood and kapuka. Other species are bracken, scrub pohuehue, golden speargrass, necklace fern, *Hieracium lepidulum**, mouse-ear hawkweed*, *Blechnum penna-marina*, *Acaena caesiiglauca*, viper's bugloss*, silver tussock, hard tussock, *Anisotome filifolia*, *Clematis* sp., patotara, *Coprosma propinqua* x *robusta*, creeping pohuehue and white fuzzweed.

Notable Flora

No threatened plant species were observed in this area. There is a historic record of weeping broom (nationally endangered), from the general area, though none were observed during the survey. The South Marlborough endemics *Brachyglottis monroi* and Marlborough rock daisy are common on riparian bluffs. Pink broom, another South Marlborough endemic, was observed on the true right side of the Jordan River and it is possible that some may occur in this zone on the property.

Plant and Animal Pests

The native remnants that remain in this catchment are induced, fragmented and occupy a small proportion of the catchment as a whole. They are heavily grazed and modified. Also, crack willow* is scattered along the river bed; and wilding pines* occur on the side slopes and bluffs on both sides of the river, though some areas of wilding spread have been controlled.

The remainder and overwhelming majority of the Happy Valley catchment contains either rank pasture grass* or shrubland-grassland. Prominent native species include matagouri, tauhinu, silver tussock and hard tussock.

## Medway Valley

This area includes all of the Medway River catchment on Awapiri Station Pastoral Lease and also includes the current Flynns Hut and dilapidated Flynns Whare.

The main vegetation communities present are:

- Mixed shrubland and scrub on alluvial terraces and side slopes
- Bluff and rock communities
- Kanuka-mixed broadleaved forest in gullies, side slopes and riparian zones
- Mountain beech forest on side slopes and riparian zones
- Mountain ribbonwood-kapuka-kohuhu treeland in gullies and riparian zones
- Mixed tussockland-exotic grassland on side slopes, ridges, valley floors and terraces
- Bracken fernland on spur slopes

The Medway River has carved a steep-sided gorge through the landscape which is long, convoluted and contains many deep pools, cascades and waterfalls. It was only sampled in places, with the remainder of the survey from air or from ridges and slopes above the gorge. The riparian areas of the

gorge support a range of scrub, treeland and forest communities. Much of the forest is dominated by kanuka or manuka, but there are also significant areas of mixed broadleaved forest including species such as akiraho, kapuka, kohuhu, kowhai, matagouri, scrub pohuehue, pohuehue, whararikí, *Clematis afoliata, C. forsterii* and *Rubus* sp. In the lower parts of the river, cabbage trees are present. In the upper sections weeping mapou, *Olearia coriacea,* lancewood, five-finger, koromiko, marbleleaf, *Coprosma linariifolia* and *Dracophyllum filifolium* are also present. Pink broom is common within this forest, particularly in inaccessible sites and on bluffs.

Pockets of black beech forest or in places black beech-red beech forest occur in the upper parts of the gorge below Flynns Hut and also in the gullies of streams draining Mt Malvern. Near Flynns Hut, *Traversia baccharoides* (declining) and *Clematis petriei* (naturally uncommon) are present. In the forest there is a mixture of lower stature shrubs including *Coprosma rigida, C. rhamnoides, C. tayloriae, Hebe traversii,* prickly mingimingi and *Helichrysum lanceolatum.* In the middle sections of the gorge, pockets of mountain ribbonwood are present. The vegetation is most intact where it is inaccessible. On gentler slopes the forest is more modified or has been replaced by scrub and rough pasture.

Mountain beech forest is present in gullies and on south-facing slopes in the headwaters of the Medway, between Medway Saddle and Flynns Whare. Secondary mountain beech-kanuka forest and scrub is present at lower altitudes. The beech forest canopy is relatively open where a combination of steep gully slopes and snow/wind damage are evident. This has led to the presence of light-demanding species in the forest interior, such as *Olearia cymbifolia* and mountain inaka. Beech pole stands (dense growth of evenly aged beech trees) are also common in light gaps. There are few woody subcanopy associate species in the area that was surveyed. Common associates include *Ranunculus reflexus, Hieracium lepidulum*,* wall lettuce* and *Blechnum penna-marina*.

Large patches of mixed beech forest are present on lower slopes and in gullies in the upper valley. The forest canopy near Flynns Hut is dominated by mountain beech. Other canopy or sub-canopy species present are kapuka, lancewood, *Coprosma linariifolia* and three-finger. Understorey species present are prickly mingimingi, pohuehue, scrub pohuehue, *Coprosma linariifolia, C. rhamnoides, C. propinqua, C. microcarpa, Helichrysum lanceolatum* and lancewood. Species present on the forest floor are *Hieracium lepidulum**,* wall lettuce*, and seedlings of kapuka and kohuhu.

Additional species present at rocky sites are *Polystichum richardii*, *Asplenium richardii*, necklace fern, *Asplenium appendiculatum*, Marlborough rock daisy, *Brachyglottis monroi*, *Heliohebe pentasepala, Helichrysum parvifolium, Gingidia montana, Cystopteris tasmanica* and snowberry. Additional species present alongside the stream from Flynns Hut are koromiko, cabbage tree, mountain ribbonwood, weeping mapou, *Blechnum penna-marina, Blechnum chambersii,* prickly shield fern, toetoe and *Carex* sp. Occassional Lombardy poplar and crack willow are also along the Medway River, particularly at hut and campsite locations; and gooseberry has a scattered distribution around the lower Medway valley.

Species commonly present in forest openings or on the forest margin are *Coprosma propinqua*, kohuhu, *Helichrysum lanceolatum*, tauhinu, mountain inaka, matagouri, tutu, *Clematis forsteri, Olearia coriacea* (naturally uncommon), *Olearia cymbifolia*, mountain wineberry, *Carmichaelia australis, Hebe traversii*, lawyer, whararikí and bidibid.

Mid-slope flaxland-shrubland in the upper valley is dominated by whararikí, tauhinu and *Coprosma propinqua*. Other canopy species are mountain wineberry, matagouri, *Coprosma rigida, C. tayloriae, Olearia cymbifolia, Clematis forsteri*, koromiko and, at damper sites, *Traversia baccharoides* (declining), with emergent *Coprosma linariifolia*, mountain wineberry and kapuka.

Lower-stature vegetation is dominated by hard tussock, cotton daisy, mountain clubmoss, mouse-ear hawkweed* and moss. Other species present are *Hieracium lepidulum*,* golden speargrass, *Pimelea* aff. *oreophila*, prickly shield fern, tutu, blue tussock, sweet vernal*, *Anisotome filifolia*, *Raoulia*

*subsericea*, red woodrush, *Ranunculus insignis*, wire moss, *Leucopogon suaveolens* and *Gaultheria crassa*. Additional species present at rocky sites are patotara, *Gingidia montana*, necklace fern, *Asplenium appendiculatum*, *Helichrysum parvifolium*, *Brachyglottis monroi*, creeping pohuehue and *Heliohebe pentasepala*.

Areas of taller vegetation on lower slopes are dominated by wharariki and *Coprosma propinqua* with emergent mountain ribbonwood, kapuka and kohuhu. Other important species present are tauhinu, *Coprosma tayloriae*, *C. linariifolia*, *Traversia baccharoides* (declining), tutu, *Hebe traversii*, *Clematis forsteri*, prickly shield fern and *Blechnum penna-marina*. This community grades down slope to patches of kapuka and then beech forest (described above).

Riparian bluffs host a variety of species including Marlborough rock daisy, *Heliohebe hulkeana* subsp. *hulkeana*, *Gingidia montana*, *Brachyglottis monroi*, wharariki, bristle tussock, *Asplenium richardii*, *Colobanthus acicularis*, *Pellaea callidirupium*, *Cystopteris tasmanica*, tutu, dog daisy* and mouse-ear hawkweed*. *Exocarpus bidwillii* occurs on bluffs near the Flynns Whare.

Matagouri shrubland occurs on river terraces in the wider sections of the river and stream beds such as near the confluence of the Medway and the stream draining from Mt Malvern. These shrublands have occasional emergent kanuka and pink broom.

Above this riparian zone and in gentler areas this riparian forest grades to either kanuka and/or manuka forest on side slopes or a shrubland of matagouri, *Coprosma propinqua*, *C. crassifolia*, *Parsonsia capsularis*, tauhinu, *Clematis* sp. and scattered bracken. Occasionally this canopy of shrubs is interrupted by an emergent kanuka, kohuhu or lancewood. The kanuka-manuka forest on side slopes typically has an understorey of *Coprosma* species including *C. propinqua*, *C. crassifolia*, *C. rhamnoides* and *C. rigida*, *Helichrysum lanceolatum*, *Corokia cotoneaster* and weeping mapou. Also commonly present are *Carex breviculmus*, *Hydrocotyle novae-zeelandiae*, bidibid, *Urtica incisa*, *Hieracium lepidulum**, wall lettuce* and dog daisy*.

Interspersed with this shrubland and on the higher side slopes is a mixed tussockland-exotic grassland within which mouse-ear hawkweed* and other hawkweed species* are common. Silver tussock is more prominent on lower slopes, hard tussock is present on the higher slopes and exotic pasture grasses are common. *Wahlenbergia albomarginata*, *Thelymitra* sp., patotara, *Geranium microphyllum*, *Pseudognaphalium luteoalbum*, dog daisy* and sheep's sorrel* are also present. Occasionally shrubs such as *Pimelea* "inland" hybrids also occur.

Shrubs such as porcupine shrub, *Helichrysum parvifolium* and prostrate kowhai occur on many of the rockier sites within this grassland-herbfield. Cotton daisy, golden speargrass, *Ranunculus insignis*, *Geranium sessiliflorum*, *Colobanthus acicularis*, *Anisotome filifolia*, *Helichrysum filicaule*, *Myosotis australis* "white", white fuzzweed, hawkweed*, sheep's sorrel*, woolly mullein*, viper's bugloss* and occasional *Raoulia australis* are also commonly found. *Raoulia monroi* (declining) was found on one outcrop overlooking Medway River near highpoint 983. Much of the ridge top leading to this high point was degraded with a greater density of exotic species.

Pockets of mountain ribbonwood, kapuka, and kohuhu commonly occur in headwater gullies above the Medway.

The lower parts of the Medway catchment, i.e. the last two tributaries on the property, are particularly bare of woody vegetation and support a mosaic of pasture and bracken.

These communities combine to form an altitudinal sequence of indigenous vegetation from the tops of Mt Malvern, Mt Monro and Black Mount down to the forests of the Medway Gorge and surrounding slopes. The tussocklands show the largest degree of modification particularly on the lower to mid-altitude slopes, where there is a mosaic of exotic dominated and native dominated grasslands, interspersed with rockland and treeland communities.

Notable Flora

The beech forest around and downstream of Flynns Hut supports the following 'at-risk' species: *Traversia baccharoides* (declining), *Olearia coriacea* and *Clematis petriei* (both naturally uncommon). South Marlborough endemic species present are *Olearia coriacea*, Marlborough rock daisy, *Brachyglottis monroi*, *Heliohebe hulkeana* subsp. *hulkeana, H. pentasepala* and pink broom. *Raoulia monroi*, classified as 'at-risk' (declining) is present near Point 983 above the Medway River. *Dracophyllum filifolium* and red beech forest is reasonably uncommon in this part of Marlborough.

Plant and Animal Pests

Crack willow* and Lombardy poplar* are scattered down the Medway River, in particular near huts and camp sites. Gooseberry* is also present at scattered locations down the valley. Occasional large wilding pines* occur on the slopes through out the catchment.

## Swale Valley

This area includes most of the Swale Stream catchment on Awapiri Station Pastoral Lease, but excludes the Chalk Range, Razorback Ridge and the small hill south of Beechs Hut (on the neighbouring property).

Plant communities present here are:

- Herbfield-gravelfield on high-altitude ridges and summits
- Tussockland-shrubland on upper slopes
- Mountain totara forest on upper slopes
- Mountain beech forest on montane slopes
- Low-stature kanuka forest in lower valleys
- Kanuka-beech forest in valleys
- Mixed red beech-mountain beech forest in mid-valleys

A mosaic of herbfield and gravelfield/stonefield is present at higher altitudes. This community was sampled on the summit and upper ridge of Mt Malvern. Herbfield communities are dominated by cotton daisy and bristle tussock. Other important species present are woolly moss, mouse-ear hawkweed*, red woodrush, patotara, snowberry, *Raoulia subsericea*, *Helichrysum parvifolium* and hard tussock. Also present are *Leucopogon suaveolens*, *Geranium sessiliflorum*, *Aciphylla monroi*, mountain clubmoss, *Anisotome flexuosa* and scattered low shrubs of tauhinu.

Steeper upper slopes are dominated by rock outcrops and steep scree slopes. Stable sites support large patches of snow totara and elsewhere a sparse community with the following plant species: sheep's sorrel*, cotton daisy, patotara, bristle tussock, *Helichrysum parvifolium*, snowberry, red woodrush, golden speargrass, *Colobanthus acicularis*, *Blechnum penna-marina*, *Leonohebe cheesemanii*, *Ranunculus insignis*, *Helichrysum corallioides*, *Aciphylla monroi*, porcupine shrub, *Heliohebe pentasepala*, *Gentiana* sp., *Anisotome flexuosa*, catsear*, harebell, *Raoulia* sp., *Olearia cymbifolia* and mountain inaka.

Gentler high-altitude slopes, especially on the Swale Stream side of Mt Malvern, support a depleted tussockland dominated by cotton daisy, bristle tussock and slim snow-tussock. Other species present on these slopes are *Helichrysum parvifolium*, *Helichrysum corallioides*, *Ranunculus insignis*, *Aciphylla monroi*, patotara, harebell, blue tussock, snowberry, mountain inaka, *Pimelea traversii*, *Asplenium appendiculatum*, *Craspedia* sp., *Hebe decumbens*, *Hebe pinguifolia*, *Leonohebe cheesemanii* and *Heliohebe pentasepala*.

High-altitude slopes on this part of the property are variously dominated by beech forest, mountain totara forest, scrub or tussock, depending on disturbance history. These communities were observed and sampled from the pack track south of Mt Malvern.

Scrub communities are dominated by mountain inaka, tauhinu, *Olearia cymbifolia*, whaririki and slim snow-tussock. Other species present are cotton daisy, *Ranunculus insignis*, tutu, bristle tussock, snowberry, prickly shield fern, bracken, golden speargrass, *Helichrysum parvifolium*, *Pimelea* aff. *oreophila*, red woodrush, mountain clubmoss, *Lycopodium australianum* and mouse-ear hawkweed*. Emergent through this scrub are mountain ribbonwood, mountain totara and/or kanuka.

Higher altitude valley floors are dominated by silver tussock, hard tussock, cotton daisy, white clover* and pasture grasses*. Other species present, especially at stony sites, are creeping pohuehue, blue tussock, bristle tussock, sheep's sorrel*, catsear*, *Coriaria kingiana*, *Geranium sessiliflorum*, *Helichrysum bellidioides*, *Hebe pinguifolia*, *Epilobium microphyllum*, and *Myosotis* "australis white". Adjacent rocky sites support Marlborough rock daisy, *Helichrysum parvifolium* and *Heliohebe pentasepala*.

Mountain beech forest dominates higher slopes in Swale valley. This forest has a uniform canopy of old mountain beech trees. Other species occasionally present in the canopy or sub-canopy are kapuka, mountain totara, *Coprosma linariifolia* and lancewood. Two clumps of the threatened beech mistletoe, *Peraxilla tetrapetala* (declining), were observed in the mountain beech forest on the south-east spur of Mt Malvern. The forest understorey is relatively open. Species present are *Coprosma rhamnoides*, bush lawyer and occasionally *Coprosma microcarpa*, *Helichrysum lanceolatum* and prickly mingimingi. Forest floor species are prickly shield fern, wall lettuce*, *Oxalis* sp., *Blechnum penna-marina*, *Asplenium richardii*, nettle, *Corybas* sp., seedlings of mountain beech and kapuka, and occasionally mountain kiokio, *Brachyscome radicata*, *Carex* sp., wire moss and thousand-leaved fern.

Additional species present at the upper forest margin are *Olearia cymbifolia*, tauhinu and *Coprosma propinqua*. Species commonly present on the mid-altitude forest margin on the property boundary are kanuka, *Coprosma propinqua*, tutu, cotton daisy, prickly mingimingi, matagouri, *Coprosma rhamnoides*, *C. tayloriae*, *Coprosma linariifolia*, *Helichrysum lanceolatum* and mountain totara. Forest regeneration here is dominated by both mountain beech and mountain totara.

Lower valley beech forest was sampled in the vicinity of Swale Hut. It is contiguous with the upper-slope forest described above. Disturbed sites support tall kanuka; otherwise the forest canopy is dominated by mountain beech with occasional lancewood, kapuka, *Coprosma linariifolia* and mountain totara. Understorey species are *Coprosma rhamnoides*, *C. propinqua*, *C. linariifolia*, lancewood, *Helichrysum lanceolatum*, *Pittosporum divaricatum*, prickly mingimingi, *Clematis forsteri*, bush lawyer and mountain beech saplings. Forest floor species are *Hieracium lepidulum**, wall lettuce*, mountain kiokio, *Carex* sp., scrub pohuehue, *Blechnum penna-marina*, prickly shield fern, *Asplenium richardii*, necklace fern, hanging spleenwort, *Pterostylis* sp., *Oxalis* sp. and seedlings of mountain beech and lancewood.

Species commonly present along the stream are kowhai, kapuka, marbleleaf, three-finger, tree fuchsia, toetoe, *Coriaria kingiana*, manuka, *Hebe stenophylla*, koromiko, korokio, tauhinu, *Brachyglottis monroi*, akiraho, whaririki, *Cystopteris tasmanica*, *Blechnum fluviatile*, *B. chambersii*, *B. minus* and *Polystichum richardii*.

Low-stature kanuka forest is present on lower slopes of Swale valley. This community was sampled along the stock-droving route and pack track east of Swale Hut. It is dominated by kanuka approximately 6 to 8 metres tall. The forest understorey is dominated by *Coprosma rhamnoides* and prickly mingimingi. Other understorey species are *Coprosma rigida*, *C. linariifolia*, *Helichrysum lanceolatum*, lancewood and *Cyathodes fasciculata*. Ground-cover species are *Hieracium lepidulum**, moss and hookgrass. Species present in forest openings or on the forest margin are matagouri, tauhinu, *Coprosma tayloriae*, patotara, mouse-ear hawkweed*, *Coriaria kingiana*, bracken, scrub pohuehue, seedlings of red beech and, at rocky sites, *Helichrysum parvifolium* and *Asplenium appendiculatum.*

Mid-valley red beech forest covers a relatively small area on apparently damper slopes mid-way up the Swale Stream tributary traversed by the pack track. Red beech was not observed elsewhere in the Swale valley. The forest canopy is variously dominated by red beech, mountain beech or kapuka and occasionally mountain totara. Understorey species are *Coprosma rhamnoides*, bush lawyer, lancewood, *Helichrysum lanceolatum*, prickly mingimingi, *Cyathodes fasciculata*, *Coprosma linariifolia*, mountain totara, prickly shield fern, thousand-leaved fern and *Clematis forsteri*. Additional species alongside streams are tree fuchsia, marbleleaf, kiokio and *Blechnum penna-marina*. This forest grades up-valley to mountain beech and/or mountain totara forest.

The riparian zone of the main stem of Swale River is of variable intactness. Steeper and/or shadier banks generally contain a higher proportion of indigenous vegetation but burning, over-sowing and grazing has meant that pasture grasses and introduced herbs are common elsewhere. Where forested, the most common native species include black beech, kanuka, kapuka, mountain totara, kowhai, marbleleaf, whararikí, lancewood and *Helichrysum lanceolatum*. The riparian cliffs and bluffs contain whararikí, matagouri, *Brachyglottis monroi*, and Marlborough rock daisy. Pink broom is present locally.

Notable Flora

Two clumps of the ‘at risk’ threatened beech mistletoe, *Peraxilla tetrapetala* (declining), were observed in mountain beech forest in upper Swale Stream. The South Marlborough endemic species include *Helichrysum corallioides, Heliohebe pentasepala, Brachyglottis monroi* and Marlborough rock daisy were found on rocky sites and bluffs. The South Marlborough endemics, pink broom is present in the Swale River riparian zone. Red beech forest is a relatively uncommon plant community in this part of Marlborough.

Plant and Animal Pests

The area described appears to be relatively intact, with the condition of indigenous vegetation declining closer to the valley floors. Where the native woody vegetation has been displaced, pasture grasses* and other weeds (e.g. hawkweed* and viper’s bugloss*) appear. The area is also influenced by the animal pests of mainly deer* and goats*; although some pigs* and hares* are present. Despite this there is natural or semi–natural vegetation cover over the vast majority of the area described.

## Mead Valley

The Mead catchment supports indigenous vegetation communities that are representative of those occurring in the southern corner of the property, comprising predominantly greywacke over a range of landforms and altitude with a small limestone ridge on the southwest spur of highpoint 807.

This area includes all of the Mead Stream catchment on Awapiri Station Pastoral Lease.

The main vegetation communities are:

- Mountain beech forest on mountain slopes
- Kanuka scrub on mountain slopes
- Mixed scrub on riparian slopes, cliffs, bluffs and riverbanks
- Mixed shrubland-herbfield on colluvial mountain slopes and talus slopes
- Bedrock outcrop communities on ridges and slopes
- Mixed exotic grassland in valley floors, ridges and hill slopes
- Mixed herbfield-grassland in riverbeds

Upper slopes, concave slopes, riparian zones and south-facing slopes which have escaped burning contain the majority of the remaining beech forest. Mountain beech dominates with mountain totara above 800m, while black beech becomes the dominant beech species below 600m. The canopy in mixed age stands is typically broken, meaning that the understorey is often comprised of species more typical of open subalpine communities (e.g. *Olearia cymbifolia*, mountain inaka, cotton daisy).

Other species occurring infrequently are kapuka, *Helichrysum lanceolatum*, kanuka, prickly mingimingi, *Olearia coriacea* (declining), and *Hieracium lepidulum**.

Kanuka scrub grades into kanuka-mountain totara-mixed broadleaved forest in the more intact and diverse south-facing gullies below 800m. Associate species include kapuka, black beech, kohuhu and akiraho. On drier, more modified parts of the catchment kanuka forms the canopy up to 2m tall. *Helichrysum lanceolatum,* prickly mingimingi and *Hieracium lepidulum** are typical associates where the canopy is tight. On the stony, limestone ridge where the kanuka canopy is relatively open, associate species include manuka, hard tussock, *Pseudognaphalium luteo-album* agg., *Linum monogynum,* white clover* and white fuzzweed*. Heliohebe hulkeana* subsp. *evestita* (declining) is also sporadically present. Taller kanuka communities (8–10m tall) on greywacke tend to have a better developed understorey. *Coprosma rhamnoides*, mountain ribbonwood, *Helichrysum lanceolatum, Polystichum richardii*, mountain totara and kapuka are the principle associate species.

On the margins of the property, in the southwestern corner, riparian zones of the Mead River tributaries are of variable intactness. The steep and/or shadier banks tend to contain a higher proportion of indigenous vegetation but pasture grasses and introduced herbs are common elsewhere. Within forested sections, the most common native species include black beech, kanuka, kapuka, mountain totara, kowhai, marbleleaf, whaririki, lancewood and *Helichrysum lanceolatum*. Riparian cliffs and bluffs contain whaririki, matagouri, *Brachyglottis monroi*, and Marlborough rock daisy.

Subalpine communities along the main ridge are diverse and, though there are signs of wild animal browsing, are unlikely to have changed significantly since pre-human times and consequently have high inherent values. The substrates include talus, colluvium, stonefield and loamfield. Vegetation density is generally sparse but some species are present throughout including mountain inaka, blue tussock, cotton daisy, *Celmisia monroi,* mountain tauhinu, *Epilobium brevipes* (declining), *Wahlenbergia albomarginata* subsp. *albomarginata, Geranium sessiliflorum,* patotara, sheep's sorrel* and catsear*.

Bedrock bluffs and outcrops typically contain mountain inaka, blue tussock, cotton daisy, *Helichrysum intermedium, H. corallioides, Aciphylla monroi* and *Ranunculus insignis*.

Pasture grasses dominate below 800m on gentle gradients, particularly on the fertile limestone. There are some indigenous species scattered through these grasslands such as matagouri, mountain tauhinu, silver tussock and hard tussock. Introduced species dominate and include white clover*, browntop*, woolly mullein*, mouse-ear hawkweed*, *Hieracium caespitosum** and viper's bugloss*.

The riverbeds tend to be weedy and dominated by exotic species such as browntop*, Yorkshire fog*, *Hieracium lepidulum** and viper's bugloss*. Creeping pohuehue, *Epilobium melanocaulon,* kanuka, manuka and matagouri are present.

Notable Flora

There are three 'at-risk' species present, all ranked as 'naturally uncommon': *Olearia coriacea* occurs in montane beech and kanuka communities where the canopy is sparse; *Heliohebe hulkeana* subsp. *evestita* is present on limestone; and *Epilobium brevipes* occurs on montane and subalpine rock outcrops. Other South Marlborough or South Marlborough-North Canterbury endemics present include Marlborough rock daisy, *Brachyglottis monroi* and *Helichrysum corallioides*.

Plant and Animal Pests

The area described is relatively intact above tree line though goats* and hares* were observed. The condition of indigenous vegetation declines with altitude and gradient, so that lowland valley floors and gentle hill slopes, particularly on high fertility limestone, tend to be very modified through historic burning, over-sowing, grazing and the impact of weeds (e.g. pasture grasses*, hawkweed*

and viper's bugloss*) and animal pests (deer*, pigs*, goats* and hares*). Despite this there is natural or semi–natural vegetation cover over the vast majority of the area described.

## Chalk Range

The main vegetation communities in this area are:

- Limestone bluff and rock communities
- Bluff and rock communities on calcareous conglomerate
- Mixed herbfield on calcareous talus
- Mixed scrub on calcareous conglomerate outcrops
- Sparse herbfield on limestone screes
- *Coprosma* shrubland on limestone boulderfield
- Mixed silver tussock-exotic grassland on ridge tops and side slopes
- Mixed scrub on limestone bluffs
- Mixed shrub-tussockland-grassland on side slopes
- Mixed shrubland, scrub and low forest in gullies and side slopes
- Kanuka-mixed broadleaved forest on riparian slopes and side slopes
- Kanuka forest on riparian slopes and side slopes
- Mixed mountain totara-beech forest on riparian slopes and side slopes
- Lancewood forest, scrub and treeland on riparian slopes and side slopes
- *Carex secta* wetlands on poorly drained colluvial side slopes and saddles
- *Polystichum* fernland

The landforms in this part of the property are very distinctive with a number of prominent parallel ridges which drop off sharply on the south side but have gentler slopes on the north side, reflecting the local fault movement. The most spectacular of these is the Chalk Range, but this pattern is also mirrored with the other progressively lower ridges to the north, including Razorback Ridge. A prominent set of bluffs outcrop to the north opposite the limestone high point 682. At the southwest end of Chalk Range much of the north facing slope is massive rock outcrops (on their bedding planes) with vegetation persisting only on the joints and fractures. Further to the east of the Chalk Range the soil cover is greater and this north-facing slope supports tussockland. A mixture of scrub and forest occurs on lower slopes and valley floors. The southern end of Chalk Range divides into two ridges with the northernmost, Sleepy Peak, occurring within the property.

The bluffs of the Chalk Range and Sleepy Peak support a variety of herbs and shrubs including *Brachyglottis monroi,* broad-leaved snow-tussock, *Carmichaelia australis, Helichrysum* "Chalk Range" (naturally uncommon), *Aciphylla glaucescens, Pimelea concinna,* Marlborough rock daisy, *Celmisia monroi, Gingidia montana, Anisotome aromatica, Heliohebe hulkeana* subsp. *evestita, Poa acicularifolia* subsp. *acicularifolia* (naturally uncommon), *Leptinella pyrethrifolia, Myosotis australis* "white", and whahariki. Scattered *Olearia odorata* and mountain ribbonwood are also present. In areas with more talus *Galium* "calcicole" and *Gentianella astonii* subsp. *arduana* (naturally uncommon) are also present, with the occasional *Carmichaelia astonii* (nationally vulnerable). Steep limestone boulderfield/scree descends to the Swale valley from the southwest side of Sleepy Peak. These screes were not visited during the survey, due to steepness and access; however, elsewhere on the Chalk Range they typically support a very sparse cover, composed of *Acaena anserinifolia,* silver tussock, *Craspedia* "Chalk" and *Anisotome filifolia* and there is no reason to believe that these screes would differ (Cathy Jones *pers. comm*.).

On the north side, ledges and fractures on the limestone outcrops commonly support silver tussock, broad-leaved snow-tussock, golden speargrass, *Galium* sp., *Wahlenbergia albomarginata, Scleranthus* sp., white clover*, vetch*, *Geranium* sp., *Lotus* sp.*, scrub pohuehue, *Viola cunninghamii,* with the occasional shrub of *Carmichaelia australis, C. astonii* (nationally vulnerable), *Pimelea concinna,* tauhinu and matagouri. A lone mountain totara was sighted in the middle of these outcrops but not visited. Where there is top soil on the northern slopes silver tussock is interspersed with exotic pasture grasses, lotus*, white clover*, vetch*, *Cardamine* sp., and the

occasional shrubs such as tauhinu, *Coprosma propinqua,* porcupine shrub and scrub pohuehue. The pasture grass component increases at gentler lower-altitude sites.

A *Carex secta* seep occupies a slumped area at the base of Sleepy Peak. The wetland is a mixture of gravel fan, small riparian channel and poorly drained area dominated by *Carex secta* pedestals. Manuka and *Coprosma propinqua* occur, as well as a variety of herbs including *Carex ovalis*, Hydrocotyle novae-zeelandiae, Epilobium minutiflorum, Lagenifera* sp., *Rorippa nasturtium-aquaticum*, Chaerophyllum colensoi* var. *delicatulum* (nationally critical). *Myosotis pygmaea* (declining) was found on one of the gravel fans associated with this slump.

Razorback Ridge consists of bluffs of calcareous conglomerate with gentler soil-covered colluvial slopes below. The ledges of the bluffs are predominately covered in a very diverse scrub of *Brachyglottis monroi,* matagouri, *Helichrysum intermedium, H. lanceolatum,* whaririki, broad-leaved snow-tussock, *Olearia coriacea* (naturally uncommon), *Coprosma propinqua, Carmichaelia australis,* golden speargrass, *Aciphylla glaucescens, Heliohebe hulkeana,* Marlborough rock daisy, *Hebe traversii,* porcupine shrub, *Clematis forsteri* with occasional mountain ribbonwood, *Fuchsia perscandens* kapuka, kanuka, pink broom and one browsed mountain totara. A diverse array of grasses and herbs occur amongst this scrub, including *Celmisia monroi, Ranunculus insignis,* bristle tussock, *Anisotome aromatica, Myosotis australis* "white", *Gingidia montana, Wahlenbergia albomarginata, Helichrysum filicaule, Cardamine corymbosa, Crassula colligata, Galium trilobum, Chaerophyllum colensoi* var. *colensoi, C. ramosa,* wall lettuce*, *Anthriscus caucalis*, Cystopteris tasmanica,* necklace fern, *Asplenium. lyallii, Epilobium nummulariifolium, Brachyglottis lagopus* and Chewings fescue*. On the ridge top, in addition to many of the species listed above, prostrate kowhai, akiraho and mountain totara are also present. Large mats of *Raoulia australis* occur on the open talus/rock areas between the scrub.

Below the bluffs and rock outcrops there is a mosaic of scrub, silver tussockland, exotic grassland and prickly shield fern fernland. The dominant shrub species is tauhinu with matagouri, kanuka, *Coprosma rhamnoides* and *C. propinqua* also present. Prickly shield fern is dense in places, but interspersed amongst it are silver tussockland and exotic grassland. Amongst this mix is a variety of herbs including *Geranium* aff. *microphyllum, Oxalis exilis, O. magellanica, Blechnum penna-marina, Ranunculus repens, Acaena dumicola,* necklace fern, *Anisotome aromatica* and sheep's sorrel*. Lower down on valley floors the shrubs diversify with cabbage tree, *Olearia odorata,* akiraho, *Hebe traversii, Fuchsia perscandens, Carmichaelia australis, Parsonsia capsularis,* pohuehue, *Rubus squarrosus* and the occasional kohuhu present.

This pattern appears to be repeated on lower conglomerate ridges north of Razorback, with a mosaic of shrubland, silver tussockland and exotic pasture grassland. Although not visited, this area was viewed with binoculars from Sleepy Peak and highpoint 682 (to the north). The lower, gentler slopes support a greater component of exotic pasture.

Limestone outcrops again at highpoint 682, east of Swale Hut. Being lower than the Chalk Range and Sleepy Peak, there is a greater woody component on this ridge but also a large number of exotic herbs and grasses. On the northern side shrubs such as matagouri, *Coprosma propinqua* and scrub pohuehue are common, with the occasional *Carmichaelia australis.* A pocket of prostrate kowhai occurs on top of the knob. Beneath silver tussock are exotic herbs such as dog daisy*, viper's bugloss*, woolly mullein*, horehound* and exotic pasture grasses*. On the steeper south side there are remnant forest and shrubland species, including kapuka, mountain totara, kohuhu, korokio, akiraho, *Coprosma propinqua, Brachyglottis monroi, Clematis forsterii,* whaririki and Marlborough rock daisy. A limestone boulderfield below the bluff supports a *Coprosma crassifolia* shrubland. *Clematis petriei,* korokio, pohuehue, *Parsonsia capsularis* and kapuka are also present.

A *Carex secta* sedgeland lies to the northeast of this peak in a flat, poorly-drained saddle. The inter-tussock vegetation has been extensively modified by over-sowing and grazing; however, the sedgeland canopy remains and is relatively extensive (approximately 1-2 ha). Drier margins contain

silver tussock. Other native associates include prickly shield fern, *Blechnum penna-marina* and *Acaena anserinifolia*.

The steep riparian slopes of the streams draining into the Swale from this limestone/calcareous country support a mosaic of kanuka, kanuka-kapuka, beech and mountain totara forests which grade into matagouri-tauhinu shrubland and grassland on the higher gentler terraces and slopes. The steeper slopes are the most diverse with kohuhu, akiraho and lancewood present amongst the kanuka.

The kanuka forest lacks understorey at its margins but on steeper slopes is more diverse with *Fuchsia perscandens, Coprosma tayloriae, Rubus squarrosus* and porcupine shrub present. Prickly shield fern is also common within and amongst these forests.

A lancewood-dominated pocket of secondary forest, scrub and treeland occurs on the side slopes and riparian slopes near highpoint 682. This community is distinctive with mixed-age lancewood, including some very large old individuals. Kanuka, kapuka, matagouri, *Coprosma propinqua*, mountain tauhinu and *Carmichaelia australis* are scattered within this community. An orchid *Pterostylis australis* was found under this canopy.

Notable Flora

The limestone areas support a range of limestone obligates including a number of species which are classified nationally as "threatened" or "at-risk" and a number of species endemic to South Marlborough.

The wetland herb *Chaerophyllum colensoi* var. *delicatulum* was found within the wetland on the poorly-drained slump area at the base of Sleepy Peak. This herb is classified as 'nationally critical', the highest possible threat ranking. Also present here is the small native forget-me-not, *Myosotis pygmaea* (declining).

The small limestone broom *Carmichaelia astoniii* was found on the limestone rocks and bluffs of both the Chalk Range and Sleepy Peak. It is a South Marlborough endemic classified as 'nationally vulnerable'.

*Helichrysum* "Chalk Range" is commonly present on the limestone bluffs of Sleepy Peak, *Gentianella astonii* subsp. *arduana* is present on the limestone talus and ledges of the Chalk Range, and *Olearia coriacea* occurs in the forest and shrub remnants, particularly below Razorback Ridge. These species are South Marlborough endemics which are classified as 'naturally uncommon'. *Craspedia* "Chalk" is similarly classified and an endemic and, although not sighted on this survey, has been found by the author and others on the Chalk Range on limestone talus and screes. These habitats were not visited on Sleepy Peak due to time and terrain constraints, but it is likely that this species will be present. Both Chalk Range and Sleepy Peak support *Poa acicularifolia* subsp. *acicularifolia* which is a calcicole grass classified as 'naturally uncommon'.

Other South Marlborough endemics present are *Heliohebe hulkeana* spp. *hulkeana*, *Heliohebe hulkeana* spp. *evestita* (naturally uncommon), pink broom, Marlborough rock daisy and *Brachyglottis monroi*.

Plant and Animal Pests

Goats were particularly obvious in the areas visited and could be heard throughout the time spent in these areas. Pigs*, deer* and hares* are also present. No major woody weeds were observed but the areas support a range of exotic herbaceous species such as dog daisy*, viper's bugloss*, woolly mullein* and horehound*.

## Notable Flora

Notable plant species recorded on the property are listed in Table 2 below. Threat categories are those proposed by de Lange *et al*. (2009).

**Table 2** **Notable plant species, Awapiri Station Pastoral Lease.**

| Threat Division | Threat Category | Species | Distribution on the Property |
|---|---|---|---|
| **threatened** | nationally critical | *Chaerophyllum colensoi var. delicatulum* | Wetland at base of Sleepy Peak |
| | | *Pimelea aridula* 'South Marlborough' | Observed at one location on a rock bluff in the McRae Stream catchment |
| | nationally vulnerable | **Carmichaelia astonii* | Limestone rocks and bluffs |
| **at risk** | declining | *Myosotis pygmaea* | Gravel patch at base of Sleepy Peak |
| | | *Peraxilla tetrapetala* | Mountain beech forest in upper Swale valley |
| | | *Raoulia monroi* | Highpoint 983 above the Medway (true left) |
| | | *Traversia baccharoides* | Medway Valley, shrublands and forest margins |
| | naturally uncommon | *Clematis petriei* | Medway Valley, shrublands and forest |
| | | *Epilobium brevipes* | Rock outcrops and bluffs |
| | | **Gentianella astonii* subsp. *arduana* | Limestone bluffs and talus |
| | | **Helichrysum* "Chalk Range" | Limestone rocks and bluffs |
| | | **Heliohebe hulkeana* spp. *evestita* | Widespread on limestone bluffs/rockland |
| | | **Olearia coriacea* | Open subalpine and montane shrublands and beech forest |
| | | *Poa acicularifolia* subsp. *acicularifolia* | Limestone rocks and bluffs |
| South Marlborough endemic | | *Brachyglottis monroi* | Widespread on bluffs/rockland |
| | | pink broom (*Carmichaelia glabrescens*) | Occasionally present in shrublands, particularly in riparian zone and on bluffs. |
| | | *Hebe decumbens* | High altitude slopes on the side of Mt Malvern |
| | | *Helichrysum corallioides* | Present on bluffs/rockland |
| | | *Heliohebe hulkeana* subsp. *hulkeana* | Widespread on bluffs/rockland |
| | | *Heliohebe pentasepala* | Rockland |
| | | Marlborough rock daisy (*Pachystegia insignis* s.s.) | Widespread on bluffs/rockland |
| distributional limit | | *Epilobium crassum*? | Bluffs in McRae Valley |
| regionally uncommon | | *Dracophyllum filifolium* | Riparian forest beside the McRae and Medway rivers |
| | | Red beech (*Nothofagus fusca*) | Medway River catchment |

* also a South Marlborough endemic

### Significance of Vegetation and Flora

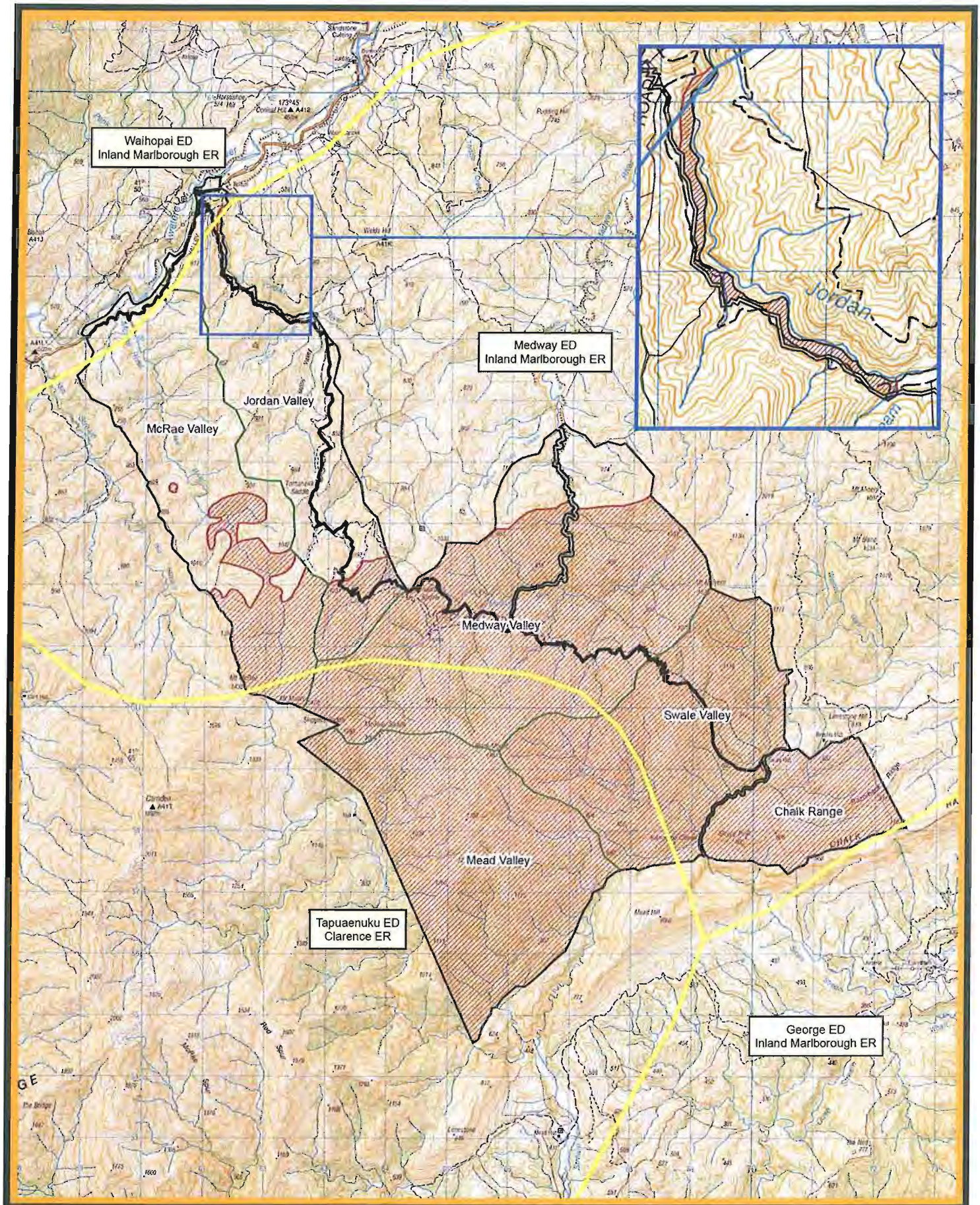
Awapiri Station Pastoral Lease supports relatively extensive areas of intact beech forest, totara forest, kanuka forest and shrubland in the Mead and Swale valleys. Limestone plant communities are present on the Chalk Range and Razorback Ridge at the eastern edge of the property. High-altitude plant communities at the centre of the property, along the Mt Monro-Black Mount-Mt Malvern ridge also have high inherent values. Areas of vegetation with significant inherent values are present in more scattered locations on the Medway, McRae and upper Jordan valleys, including large patches of forest and notable flora along stream sides and on rock bluffs. Populations of three 'threatened' species, *Chaerophyllum colensoi* var. *delicatulum* and *Pimelea aridula* 'South Marlborough' (both nationally critical) and *Carmichaelia astoniii* (nationally vulnerable), are present on the property. Populations of four 'at-risk, declining', seven 'at-risk, naturally uncommon', one distributional limit and a further seven South Marlborough endemic species are present. Inherent values on the property generally decline from southeast to northwest, though notable altitudinal and landform vegetation sequences are present.

## 2.5.3 Problem Plants

Hawkweeds, particularly mouse-ear hawkweed*, *Hieracium caespitosum** and *H. lepidulum* are widespread throughout the property, as they are through much of the upland parts of South Marlborough. These species are still spreading and along with introduced pasture species they represent the biggest exotic component in the landscape.

The main woody weeds on the property are pines, willow and Lombardy poplar. The pines are scattered through the Medway catchment and common in the lower Jordan catchment, although there has been some recent control work in the Jordan catchment. Willows occur through riparian areas of both the Jordan and Medway, while Lombardy poplars also occur in the Medway catchment. The willows in particular have potential to spread through riparian areas. Gooseberry is scattered through the Medway, originating from early occupation sites and probably spread by birds.

Vegetation Values Map




# Botanical Values - Awapiri Station Pastoral Lease
# Conservation Resources Report 2010

Department of Conservation
*Te Papa Atawhai*

New Zealand Government

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**Legend**

- Awapiri Station Pastoral Lease
- Awapiri Station Botanical Units
- Awapiri Station Botanical Values
- Ecological Regions and Districts

Base map - LINZ topographic series
Cadastre - LINZ Febuary 2010

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Canterbury Conservancy - Tenure Review

8 October 2010

# 2.6 FAUNA

## 2.6.1 Birds and Lizards

The Medway and Tapuaenuku districts have not been surveyed under the Protected Natural Areas Programme so there is limited ecological fauna information for the area. Notable bird species recorded from adjacent Camden Pastoral Lease and Glenlee Pastoral Occupation Licence (POL) include eastern falcon (nationally vulnerable), New Zealand pipit (declining) and South Island rifleman (declining) (Elkington, 2006; DOC, 2002). Kea (naturally uncommon) has been recorded from nearby Mt Gladstone POL (Sedgeley, 2005).

The Inland and Seaward Kaikoura ranges support a diverse assemblage of threatened lizard species, including scree skink (gradual decline), spotted skink "South Marlborough" (gradual decline), black-eyed gecko (sparse), long-toed skink (sparse), rough gecko (gradual decline) and Kaikouras gecko (range restricted). In addition, South Marlborough is notable for supporting up to five members of the "common gecko" species complex (Hitchmough, 1997; Herpetofauna Database). The members of this complex have yet to be formally described, but are recognized as being distinct species for conservation purposes (Hitchmough *et al*. 2007).

Despite the high species richness documented for the Kaikoura area, lizard abundance and species richness reported from nearby pastoral leases are generally low. For example, just three individuals of two species (common skink and Marlborough mini gecko) were found on Glenlee Pastoral Lease (Elkington, 2006). Southern Alps gecko appears to reach its northern limit on Mt Gladstone POL (Sedgeley, 2005). Scree skink and black-eyed gecko have been recorded from the Chalk Range and from the Hodder River catchment, respectively (Herpetofauna Database). Finally, there is a 1965 record of forest gecko from the Dumgree in the Awatere Valley, which is unusual because there are very few records of this species in Marlborough and Canterbury (Herpetofauna Database).

Bird and lizard species observed on Awapiri Station Pastoral Lease are described for three geographic areas of the property.

### McRae and Jordan Catchments

This northern part of the property contains the McRae River catchment and part of the Jordan River catchment. It is bounded to the north by the Awatere and Jordan rivers, to the east and west by the property boundary, and to the south by the prominent ridge connecting Mt Monro and Tomlinsons Saddle. It is the most modified part of the property; exotic pasture is dominant, with mixed shrubland present in gullies. Rock outcrops are present throughout.

Native bird species recorded from this area were bellbird, brown creeper, eastern falcon (one sighting of a lone bird), grey warbler, New Zealand pipit (one sighting of a lone bird), paradise shelduck, silvereye, South Island fantail, South Island rifleman (one sighting of two birds) and swamp harrier.

Introduced bird species observed were Australian magpie, blackbird, California quail, chaffinch, dunnock, goldfinch, greenfinch, mallard, redpoll, skylark, song thrush and yellowhammer.

Common skink (4 individuals) and an unidentified gecko species (2 individuals) were recorded from several sites in this area. Geckos were restricted to rock outcrops.

### Medway Catchment

This area comprises the middle part of the property. It is bounded to the southeast by the prominent ridge extending from Black Mount, to the north and southwest by the property boundary, and to the

west by the ridge connecting Mt Monro and Tomlinsons Saddle. It includes the upper Medway River catchment and part of the upper Mead Stream catchment. Gullies contain beech forest, shrubland and outcropping rock, giving way to degraded short tussockland, exotic pasture and rockland at higher altitudes.

Native bird species recorded from this area were bellbird, brown creeper, eastern falcon (one sighting of a lone bird), grey warbler, kereru, kea (one sighting of a lone bird), New Zealand pipit (three sightings of lone birds), shining cuckoo, silvereye, South Island robin, southern black-backed gull, swamp harrier, South Island tomtit and welcome swallow.

Introduced bird species observed were blackbird, California quail, chaffinch, dunnock, greenfinch, redpoll, skylark, song thrush, starling and yellowhammer.

Common skink (14 individuals), Kaikouras gecko (three individuals from two sites) and an unidentified gecko (two individuals) were recorded from various sites in this area. Geckos were recorded from rock outcrops and talus, whereas skinks were observed in a greater variety of habitats (rockland, shrubland and grassland).

## Chalk Range, Swale and Mead Catchments

This area contains part of the Chalk Range and the upper catchments of Mead and Swale streams. It is bounded to the north and west by a prominent ridge that extends from Black Mount and to the south and east by the property boundary. The Chalk Range is the most striking landscape feature, and contains exposed limestone bedrock, degraded short tussockland and exotic pasture. Beech forest and shrubland dominate at low- to-mid altitudes below Black Mount, giving way to rockland at higher altitudes.

Native bird species recorded from this area were bellbird, brown creeper, eastern falcon (five sightings: one observation of a pair of birds and four sightings of lone birds; one sighting was off but adjacent to the lease boundary), grey warbler, kingfisher, New Zealand pipit (five sightings of lone birds; one sighting was off but adjacent to the lease boundary), paradise shelduck, South Island fantail, South Island robin, South Island rifleman (two sightings of several birds each), silvereye, swamp harrier and South Island tomtit.

Introduced bird species observed were Australian magpie, blackbird, California quail, chaffinch, dunnock, goldfinch, greenfinch, redpoll, skylark, song thrush and yellowhammer.

Common skink (19 individuals) and Marlborough mini gecko (8 individuals) were observed in grassland and rockland on and in the vicinity of the Chalk Range, with geckos restricted to rockland (limestone pavement and boulder field). In addition, an unidentified gecko species was seen in the upper Mead Stream catchment.

## Bird Species Recorded

Thirty-one bird species were recorded from Awapiri Station Pastoral Lease, consisting of 18 native species (Table 3) and 13 introduced species. Introduced bird species recorded were Australian magpie, blackbird, California quail, chaffinch, dunnock, goldfinch, greenfinch, mallard, redpoll, skylark, song thrush, starling and yellowhammer.

**Table 3** **Native bird species recorded from Awapiri Station Pastoral Lease, November 2009.**

| Species | Threat status | Distribution on/near property |
|---|---|---|
| *Threatened and At Risk species* | | |
| eastern falcon | nationally vulnerable | Throughout |
| kea | naturally uncommon | Ridge top in Medway River catchment |
| New Zealand pipit | declining | Open habitats throughout |
| South Island rifleman | declining | Indigenous woody vegetation throughout |
| *Non-threatened species* | | |
| bellbird | | Indigenous woody vegetation throughout |
| brown creeper | | Indigenous woody vegetation throughout |
| grey warbler | | Indigenous woody vegetation throughout |
| kereru | | Medway River catchment |
| kingfisher | | Mead Stream |
| paradise shelduck | | Streams and pasture throughout |
| shining cuckoo | | Indigenous woody vegetation in Medway River catchment |
| silvereye | | Indigenous woody vegetation throughout |
| southern black-backed gull | | Medway River catchment |
| South Island fantail | | Pine forest near homestead and indigenous woody vegetation throughout |
| South Island robin | | Indigenous woody vegetation in Swale, Mead and Medway River catchments |
| South Island tomtit | | Indigenous woody vegetation throughout |
| swamp harrier | | Throughout |
| welcome swallow | | Medway River catchment |

## Lizard Species Recorded

Fifty-three lizards representing three known species (Table 4) were recorded from 44 sites on the property. This total represents 37 common skinks, eight Marlborough mini geckos, three Kaikouras geckos (range restricted) and five unidentified geckos (most likely to be Marlborough mini gecko or Kaikouras gecko). Geckos were restricted to rockland habitats (talus, rock outcrop, limestone pavement and boulder field), whereas skinks were found in a greater range of habitats (grassland, shrubland and rockland).

**Table 4** **Lizard species recorded from Awapiri Station Pastoral Lease, November 2009.**

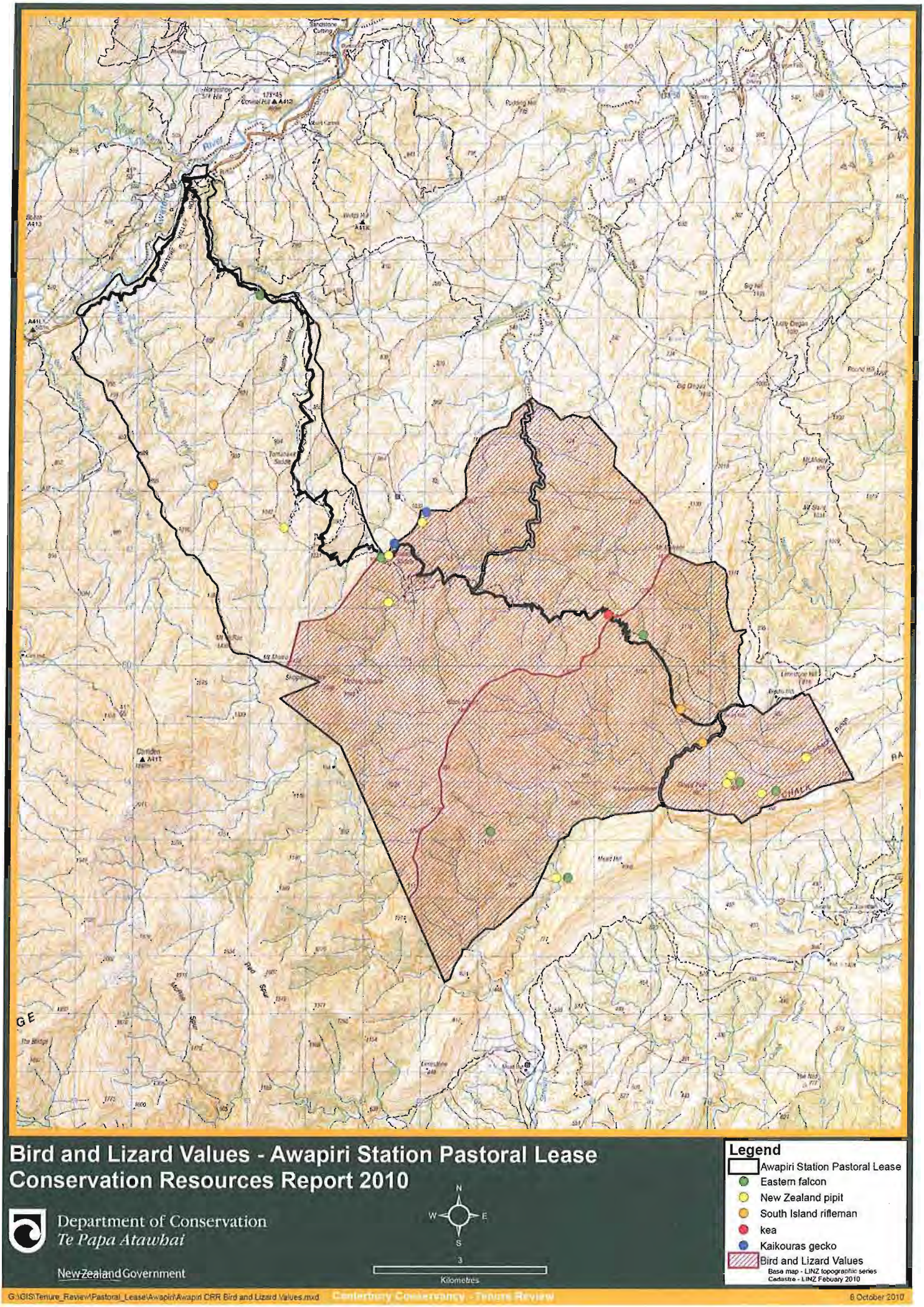
| Species | Threat status | Distribution on property |
|---|---|---|
| common skink | not threatened | Grassland, shrubland and rockland throughout |
| Marlborough mini gecko | not threatened | Limestone areas on the Chalk Range |
| Kaikouras gecko | range restricted | Rockland in the Medway River catchment |

## Significance of the Bird and Lizard Fauna

Awapiri Station Pastoral Lease provides feeding and breeding habitats for one threatened bird species: eastern falcon (nationally vulnerable); three ‘at-risk’ bird species: kea (naturally uncommon), New Zealand pipit (declining) and South Island rifleman (declining); and one ‘at-risk’ lizard species: Kaikouras gecko (range restricted). The property also provides feeding and breeding habitats for 14 non-threatened native bird species and two non-threatened lizard species (common skink and Marlborough mini gecko).

Suitable habitat is also present for five threatened lizard species that were not recorded during this survey, but have previously been observed in the Kaikoura area: black-eyed gecko (sparse), long-toed skink (sparse), scree skink (gradual decline), spotted skink (gradual decline) and rough gecko (gradual decline). Potential habitats for these species are bluffs (black-eyed gecko) and other rockland habitats (scree, talus and eroded river terraces) (long-toed skink, scree skink and spotted skink), and indigenous woody vegetation (mature shrubland and forest) (rough gecko).

Bird and Lizard Values Map



## 2.6.2 Freshwater Fauna (fish and invertebrates)

Awapiri Station Pastoral Lease is drained by the Awatere and Clarence rivers. Awatere River tributaries on the property are the McRae, Jordan and Medway rivers. Clarence River tributaries are Mead and Swale streams. The Awatere and Clarence rivers are both free of the large barriers present in some other South Island rivers. This has two important effects on the fish communities: they are more likely to include diadromous species (species with a sea phase in their lifecycle) and fish species are able to migrate between streams.

The Clarence River, including all tributaries on the property, is recognised as a 'Type I' Waters of National Importance (Chadderton *et al*, 2004), meaning that the waterways in this catchment contain special features of national significance.

The New Zealand Freshwater Fish Database (NZFFD) has 149 records from the Clarence River catchment and 119 records from the Awatere River catchment as at 15th of April 2010. There are seven species recorded from near the boundary of the property in the Awatere River catchment: shortfin eel, longfin eel, torrentfish, koaro, northern flathead galaxias, upland bully and brown trout. There are no records from close to the property in the Clarence River catchment. Two of these species are listed as 'at-risk' (Hitchmough *et al.* 2007): longfin eel (gradual decline) and northern flathead galaxias (range restricted).

The property comprises five main catchments of freshwater habitat. These habitats and the fish and macro-invertebrate species recorded are described below.

### McRae River Catchment

This area of approximately 1200 hectares comprises the northwest part of the property. The main waterbodies are the McRae River and its tributaries. These flow through grassland, shrubland, and occasional scree and rock-bluff plant communities. The grasslands vary in naturalness, with more native vegetation such as snow-tussock on upper slopes and more exotic pasture grasses at lower altitudes. All waterbodies are accessible to stock and wild animals.

McRae River ranges in approximate width from two metres in its middle reaches to three metres in its lower reaches. Tributary streams are less than one metre wide. The river varies in approximate depth from 200 mm in the middle reaches to 300 mm in the lower reaches, with pools up to one metre deep. Tributary streams are approximately 100 mm deep. The lower reaches of McRae River have a gravel-cobble substrate. The upper reaches and tributary streams have cobble-boulder and bedrock substrates.

Two sites were surveyed in this catchment. Northern flathead galaxias were found in the upper and lower valley, and longfin eel was found in the upper valley. The NZFFD records northern flathead galaxias from this catchment and records northern flathead galaxias, longfin eel and an unidentified eel species from an adjacent stream catchment.

Macro-invertebrate fauna assemblages indicate that the larger streams in this area have very good water quality. Species recorded were: mayflies (*Coloburiscus humeralis*, *Deleatidium lillii*-group, *Deleatidium myzobranchia*-group, *Nesameletus* sp. and *Rallidens mcfarlanei*); caddisflies (*Aoteapsyche* sp., *Helicopsyche* sp., *Hydrobiosis* sp., *Olinga feredayi* and *Pycnocentria* sp.); two-winged flies (*Austrosimulium* spp. and *Chironominae* sp.); flatworm (*Cura* sp.); and worm (*Oligochaete* sp.).

## Jordan River Catchment

This area of approximately 980 hectares comprises the northeast part of the property. The main waterbodies are the tributaries of Jordan River, including Lookout Stream, Happy Valley and the un-named headwater tributaries between Tomahawk and Tomlinsons saddles. Small 'palustrine seepage' and 'riverine shallow-water' wetlands are present in the catchment headwaters. The streams flow through grassland, shrubland and rock-bluff plant communities. Willow trees are present along Jordan River and some tributary streams. Wetlands support rushland, sedgeland and herbfield (turf) plant communities. All waterbodies are accessible to stock and wild animals, and some are forded by vehicle tracks.

Jordan River ranges in approximate width from one metre in the upper reaches to two metres in the middle reaches and three metres in the lower reaches. Larger tributaries are approximately one metre wide; other tributaries are less than a metre wide. The river and its tributaries are between 100 and 200 mm deep, with pools up to half a metre deep. River and stream substrates are mainly boulders and cobbles, with areas of bedrock in the gorge and finer gravels in gentler areas.

The wetlands vary in size from 20 $m^2$ to more than 40 $m^2$. Seepage wetlands generally have little or no surface water present and have silty substrates; shallow-water wetlands are often contiguous with adjacent waterways and have gravel substrates.

Five sites were surveyed in this catchment. Northern flathead galaxias were found at four sites. Redfin bully, an unidentified small bully and brown trout were found in the lower reaches beside the Awatere Valley Road bridge.

Macro-invertebrate fauna assemblages indicate that the streams in this area have very good water quality. Species recorded were: mayflies (*Coloburiscus humeralis*, *Deleatidium lillii*-group, *Deleatidium myzobranchia*-group and *Nesameletus* sp.); stoneflies (*Stenoperla prasina* and *Zelandobius* sp.); caddisflies (*Aoteapsyche* sp., *Helicopsyche* sp., *Hydrobiosis* sp., *Olinga feredayi*, *Pycnocentria* sp. and *Pycnocentrodes aeris*); dobsonfly (*Archichauliodes diversus*); two-winged flies (*Austrosimulium* spp. and *Chironominae* sp.); flatworm (*Cura* sp.); and worm (*Oligochaete* sp.).

## Medway River Catchment

This area of approximately 1900 hectares comprises the upper reaches of Medway River, in the mid-east part of the property. The main waterbodies are the tributaries of Medway River. Small 'palustrine-seepage' wetlands are present in the catchment headwaters. The streams flow through grassland, shrubland, forest and rock-bluff plant communities. Wetlands support rushland and sedgeland plant communities. All waterbodies are accessible to stock and wild animals, and some are forded by vehicle tracks.

Medway River ranges in approximate width from two metres in its upper reaches to four and a half metres in its lower reaches. Larger tributary streams are up to one metre in width. The river has an average depth of approximately 200 mm with pools of up to one metre deep. Tributary streams are up to 100 mm deep. River and stream substrates are mainly boulders and cobbles, with bedrock in gorgy sections. The wetlands are up to 20 $m^2$, generally have little or no surface water and have silty substrates.

Two sites were surveyed in this catchment. Northern flathead galaxias were found at both sites. Longfin eel and upland bully were found at the lower site.

Macro-invertebrate fauna assemblages indicate that the streams in this area have very good water quality. Species recorded were: mayflies (*Coloburiscus humeralis*, *Deleatidium lillii*-group,

*Deleatidium myzobranchia*-group, *Nesameletus* sp. and *Rallidens mcfarlanei*); stonefly (*Stenoperla prasina*); caddisflies (*Aoteapsyche* sp., *Helicopsyche* sp., *Hydrobiosis* sp. and *Olinga feredayi*); two-winged flies (*Austrosimulium* spp. and *Chironominae* sp.); flatworm (*Cura* sp.); and worm (*Oligochaete* sp.).

## Mead Stream Catchment

This area of approximately 1220 hectares comprises the catchment of Mead Stream in the southwest part of the property. The main waterbodies are Mead Stream and its tributary streams. These streams flow through high-altitude herbfield, tussockland, scree and rock, and mid-altitude forest, shrubland and grassland. This area is largely inaccessible to stock, though accessible to wild animals. There are no vehicle tracks in this area.

Streams are up to one metre wide and approximately 100 mm deep, with pools up to 400 mm deep. Stream substrates are boulder, cobble and coarse gravel, with areas of bedrock.

No sites were able to be surveyed in this catchment due to logistic issues.

## Swale Stream Catchment

This area of approximately 1560 hectares comprises the catchment of Swale Stream in the southeast part of the property. The main waterbodies are the tributaries of Swale Stream. These streams flow through high-altitude herbfield, tussockland, scree and rock, and mid-altitude forest, shrubland and grassland. The lower grasslands are accessible to stock; however, the forest areas are generally not. The entire area is accessible to wild animals. A vehicle track fords Swale Stream.

The Swale Stream tributaries are between one and two metres wide and between 100 and 200 mm deep, with pools over 600 mm deep. Stream substrates are boulder, cobble and coarse gravel, with areas of bedrock.

No sites were able to be surveyed in this catchment due to logistic issues.

## Species Recorded

Five fish species were recorded during the freshwater fauna survey of Awapiri Station Pastoral Lease (Table 5). The macro-invertebrate fauna communities appear uniform across the property.

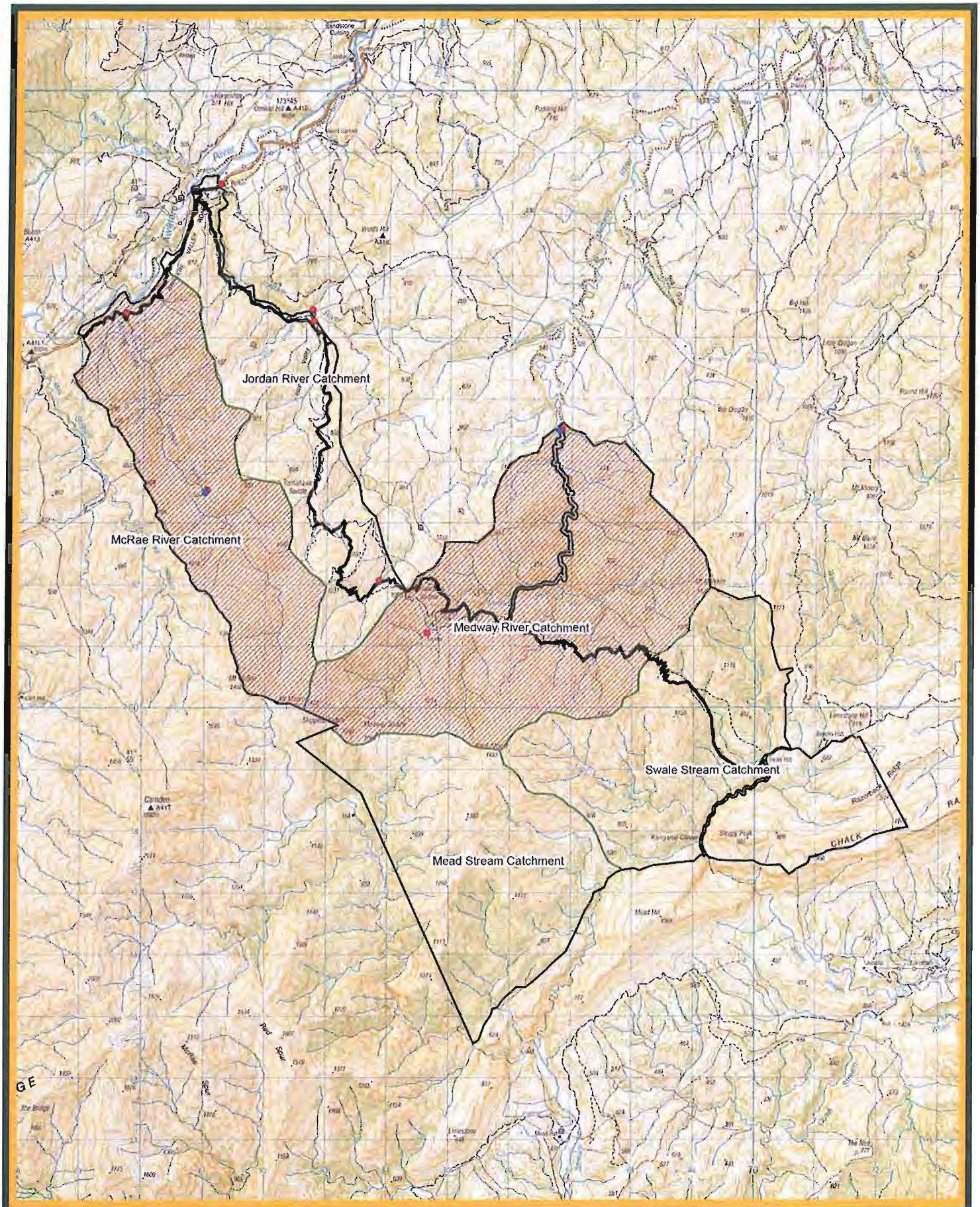
**Table 5** **Fish species recorded from Awapiri Station Pastoral Lease, November 2009.**

| Fish Species | Threat Status | Known Distribution on Property |
|---|---|---|
| brown trout | introduced | Lower Jordan River |
| longfin eel | gradual decline | McRae River and Medway River |
| northern flathead galaxias | range restricted | Throughout |
| redfin Bully | not threatened | Lower Jordan River |
| upland bully | not threatened | Lower Medway River |

## Significance of Freshwater Fauna

Awapiri Station Pastoral Lease provides good-quality habitat for fish and macro-invertebrates. Two notable fish species were recorded from the property: longfin eel (gradual decline) which is directly related to their greatly reduced distribution from historic records; and northern flathead galaxias (range restricted) which is a genetically different variant of the more ubiquitous Canterbury galaxias. Tributaries of the Clarence River on the property have national significance as part of a ‘Type I’ Waters of National Importance.

Aquatic Values Map




# Freshwater Fauna Values - Awapiri Station Pastoral Lease
# Conservation Resources Report 2010

Department of Conservation
*Te Papa Atawbai*

New Zealand Government

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**Legend**

- Awapiri Station Pastoral Lease
- Longfin eel
- Northern flathead galaxias
- Awapiri Station Freshwater Fauna Units
- Awapiri Aquatic Values

Base map - LINZ topographic series
Cadastre - LINZ Febuary 2010

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## 2.6.3 Terrestrial Invertebrates

Awapiri Station Pastoral Lease has received limited attention from invertebrate zoologists. A few visits were made into the Awatere Valley by a handful of early New Zealand collectors. Some DSIR Entomology Division staff made forays into this area in the 1960s. Much of the information gathered lies on label data in invertebrate collections, which remains effectively inaccessible at present. Some species distributions and information can be inferred from information gathered from adjoining areas or properties.

The survey area lies within a broad range of dry, eastern South Island habitats, from Marlborough south of the lower Wairau River to eastern and Central Otago. There appear to be some extensive faunal affiliations within certain groups across this range, while other groups show species changes at intermediate or even quite local scales.

Several threatened moth species, including a number of species associated with small-leaved *Olearia*, occur or once occurred throughout this range. A few are also known from the east coast of the North Island. The threatened *Gingidia*-feeding moth, *Gingidiobora nebulosa*, has its type locality at Coverham, southeast of the Chalk Range and less than three kilometres from the property boundary. This species is also known from Otago, but there are few records from Canterbury. Other species appear more confined to South Marlborough and North Canterbury, such as the bluff weta, which is known from a number of sites south and west of the property. The Marlborough giant weta, is thought to have formerly been widespread through South Marlborough and North Canterbury, a range still occupied by the speargrass weevil, *Lyperobius huttoni*. Some beetle groups, such as the carabid genera *Cicindela* (tiger beetles), *Megadromus* and the large darkling beetle genus *Mimopeus*, have a majority of their species distributed through these eastern areas. Some of these groups have species with quite confined distributions within South Marlborough and/or North Canterbury. A small group of *Mimopeus* species, each with very limited distribution, is centred on the Awatere valley, one having its type locality at The Jordan.

The expected picture of invertebrate faunal affiliations is therefore of a range of South Island or New Zealand-wide species; a substantial number of species with greater or lesser distribution through the eastern South Island (some also reaching the North Island east coast); possibly a similar number confined to within the South Marlborough/North Canterbury area; and some species specific to a limited part of South Marlborough.

A key feature determining the presence/absence of particular invertebrate species and/or their distributions is the nature and composition of vegetation through the area. Areas of primary forest are quite rare in this dry country and act as reservoirs of forest species which once occurred more widely. Grey scrub communities with good plant species diversity are a rich habitat for native herbivorous invertebrates, including a number of rare species. In most habitats, wetlands and their associated flora add considerable diversity to invertebrate communities. Even habitats with more limited vegetation, such as screes and bluffs, have their own distinctive invertebrate communities.

Invertebrate values on Awapiri Station Pastoral Lease are described for five geographic areas of the property.

### McRae River valley

The main habitats surveyed in this area were:

- regenerating forest of mixed species, including stands of kapuka forest on small flats
- shrubland, ranging from grey scrub to kanuka
- some scarp and scree habitats of variable quality, including bedrock outcrops and scarps on surrounding ridges and spurs

McRae River valley is predominantly in pasture, with extensive areas of browntop* which is a virtual desert for most native grass-feeders. Most of the habitats of interest are riparian or lie on the lower valley slopes, often in shady, south-facing locations. In one particularly exceptional area there is a mosaic of small, graded screes falling from mid-slope scarps 50-100m above the valley floor, flanked by mixed hardwood scrub and with kapuka forest in the valley bottom. The bluffs and scree have a good range of hardwood and herb species.

A shell of the threatened land snail *Wainuia* 'nasuta' (gradual decline) was found in mixed pasture/shrubland in the valley. The diversity of remnant and regrowth vegetation suggests that a number of these sites will hold similarly diverse invertebrate communities.

## Jordan Valley/Happy Valley

The main habitats surveyed in this area were:

- regenerating shrubland and grey scrub along streams and on steeplands, largely surrounded by pasture
- bedrock outcrops forming bluffs and escarpments, mostly at smaller scales

Shrubland is scattered through this area. Those shrublands investigated in detail had mainly low to moderate plant species diversity, with most dominated by matagouri and *Coprosma propinqua*. Taller shrubregeneration at some sites, such as one investigated in lower Happy Valley, had limited diversity, with a predominance of kanuka. Plant diversity increased at some sites, especially below the track on steep slopes dropping to the Jordan River. There was a significant increase in diversity in the head of the Jordan River where the track crosses before ascending to Tomlinsons Saddle. Here the shrubland contain a subalpine component, including flax and speargrass.

A shell of the threatened land snail *Wainuia* 'nasuta' was collected from the head of the Jordan River. The continued presence of the land snail *Wainuia* 'nasuta' indicates that an original faunal element is still present in some parts of this site, despite extensive modification. The upper parts of this catchment have good invertebrate habitats of native vegetation in reasonable condition.

## Upper Medway Valley

The main habitats surveyed in this area were:

- stands of residual beech forest near to and upstream of Flynns Hut
- shrubland, grey scrub and riparian forest with high connectivity and a good mix of species, especially along the steep lower slopes of the valley
- contiguous or isolated patches of grey scrub, shrubland and beech forest at higher altitudes
- small wetlands, generally isolated within pasture
- rocky bluffs and cliffs along the valley with a broad mix of Marlborough bluff plants

Substantial plant species diversity in this area range from bluff-inhabiting species through grey scrub and regenerating forest to beech forest. This high diversity is likely to support a parallel diversity of invertebrate species. While these habitats generally follow the Medway River they are not all confined to the riparian zone or associated gorges and often reach higher altitudes.

A specimen of the rare ground beetle, *Megadromus compressus* (sparse), was found near Tomlinsons Saddle. This species is a Marlborough endemic. The mosaic of mature and regenerating forest, scrubland and rockface habitats mainly with high connectedness in this site will ensure that original invertebrate communities will be largely intact. Some of the more isolated small bush remnants will hold depleted invertebrate assemblages with lesser values.

## Swale Stream and Mead Stream catchments

The main habitats surveyed in this area were:

- extensive stands of mature and regenerating beech forest and mountain totara forest
- extensive regenerating shrubland contiguous with forest
- bluffs, rockfaces, screes and boulder tumbles scattered throughout
- subalpine and alpine habitats on and around the higher peaks

This area has extensive stands of primary beech forest contiguous with a mosaic of regenerating and second-growth forest, kanuka shrubland and mountain totara forest. At higher altitudes it has extensive subalpine and alpine habitats. Bluffs and scree are scattered throughout at a range of scales and altitudes. This area has the most extensive high-quality invertebrate habitats on the property, with high connectivity.

This area supports the vulnerable land snail *Wainuia* "nasuta" (gradual decline), the rare ground beetle *Megadromus compressus* (sparse) and also has a new (hitherto unrecorded) distinctive species of oecophorid moth in the genus *Chersadaula* which is likely to be a Marlborough endemic. The extensive mature forest with high connectivity means that this site will hold an invertebrate community that would have once been more widespread through similar forests in the Clarence Catchment.

## Chalk Range/Razorback Ridge

The main habitats surveyed in this area were:

- bluff habitats with extensive and varied woody vegetation on the escarpments of Razorback Ridge and Sleepy Peak
- steep boulder tumbles and talus on or below the escarpments
- good mixed grey shrubland on consolidated talus below Razorback Ridge
- shrubland and regenerating forest nearer the main stem of Swale Stream, ranging from low to very high diversity
- bedrock streams with abundant aquatic fauna
- one wetland, of limited extent, within pasture and scattered scrub

This area has mixed habitat values, with very high values present on the escarpments of Razorback Ridge and Sleepy Peak. Both sites hold a diverse mix of shrubby hardwoods, small trees and rockface species, providing a broad and varied invertebrate habitat. Conversely, the steep dip slopes of the Chalk Range and Sleepy Peak have comparatively limited invertebrate habitat values, as there is little remaining original vegetation. This vegetation has been replaced by extensive swards of browntop*, which is unpalatable to most native grass-feeding insects. Associated areas of scree and exposed bedrock are now highly exposed to the sun and lack vegetative shade which would once have made them more suitable as habitat. Nonetheless, the continued presence of lizards in these locations suggests that some invertebrate populations are present, even in these conditions.

The presence of *Olearia odorata* in shrubland indicates that one or more of the rare moth species associated with this plant in Marlborough may be present, although in the sites visited, this plant was sparsely distributed. The extensive presence of *Gingidia montana* on the rockfaces beyond the reach of browsing, such as the south face of Razorback Ridge, make it very likely that the rare moth *Gingidiobora nebulosa* (gradual decline) is present. Feeding sign on plants consistent with that caused by the caterpillars of this species was noted, but no caterpillars were found in the available time. The type locality for *G. nebulosa* is Coverham, just three kilometres from Razorback Ridge across the Chalk Range.

This area has extensive shrublands with a broad species mix as well as outstanding rockface and bluff vegetation with species that are excluded elsewhere by browse pressure. There are also rock

tumbles and screes, adding habitat diversity. Together these features provide excellent habitat for a wide range of invertebrate species.

## Species Recorded

**Table 6** **Notable invertebrate species recorded from Awapiri Station Pastoral Lease**

| Species | Threat Status | Distribution/comments |
|---|---|---|
| *Wainuia* "nasuta" | gradual decline | McRae, Jordan, Swale and Mead catchments. |
| *Megadromus compressus* | sparse | Upper Medway and Mead catchments and certain to occur widely in Swale Stream catchment also. |
| *Chersadaula* sp. | A distinctive un-described species | Swale Stream. This is likely to be a Marlborough endemic, possibly with a quite limited range. |

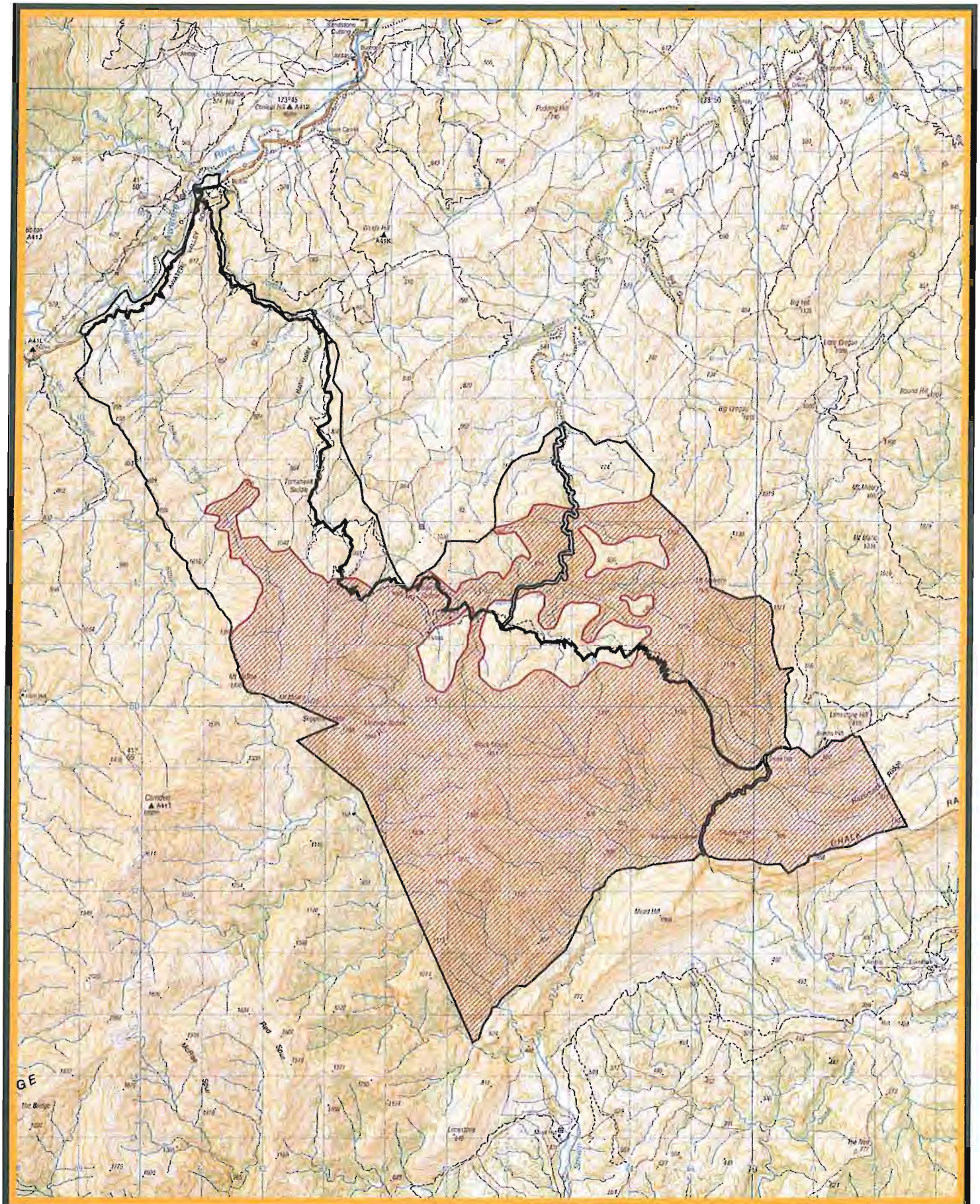
Species not found during this survey but likely to be present on the property include *Gingidia* looper moth, *Gingidiobora nebulosa* (gradual decline), scree weta (in the alpine zones; no threat category) and possibly the bluff weta (largely in subalpine rockfaces; sparse).

## Significance of the Invertebrate Fauna

In the Swale and Mead catchments the property has fine altitudinal sequences of indigenous vegetation, including large areas of mature forest, regenerating forest and tall shrubland, which will be reflected in the associated invertebrate fauna. This would be amongst the larger stands of remnant forest habitat in this part of the Clarence catchment and therefore representative of an invertebrate community which is now fragmented and lost from large areas.

In the upper Medway catchment the property has diverse woody vegetation including remnant stands of primary beech forest on the slopes and riparian forest along the stream, with healthy, diverse grey scrub and bluff/rockface communities, which are also reflected in invertebrate species diversity. In McRae River valley a number of the shrublands and residual forest have significant value for invertebrates, with evidence for the persistence of rarer species in even quite modified habitats. The property supports at least two invertebrate species which are threatened, *Wainuia* "nasuta" (gradual decline) and *Megadromus compressus* (sparse); and more would almost certainly be found given more survey time. At least one species was found which is new to science, *Chersadaula* sp.

Invert values map



# Invertebrate Values - Awapiri Station Pastoral Lease
# Conservation Resources Report 2010

Department of Conservation
*Te Papa Atawhai*

New Zealand Government

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**Legend**

- Awapiri Station Pastoral Lease
- Invertebrate Values

Base map - LINZ topographic series
Cadastre - LINZ Febuary 2010

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### 2.6.4 Problem Animals

Goats* were observed at several locations on the property, notably on the Chalk Range. Pig* damage appears to be localised but severe where it was observed. There is either evidence or known populations of other pest animals which impact native vegetation communities: in particular hares*, possums* and deer*. With the possible exception of hares*, numbers do not appear to be high.

## 2.7 HISTORIC

### 2.7.1 European Heritage Values

Awapiri Station (Run 209/SGR 193) is a central Awatere valley pastoral lease of approximately 6880 hectares. Its history appears well documented and has been collated from a number of sources.

Following the lead of pioneer pastoralists Clifford and Weld who established Flaxbourne Station in1846 and the opening up of the Awatere to runholding by the New Zealand Company in 1848, almost all of the Awatere country was taken up by the end of 1851 (Kennington, 1978). Molesworth (Barefells Run) was the last in 1854.

The first lessee of the bulk of the land that forms Awapiri, William Sutherland McRae was a dominant figure in the early European exploration of the Awatere. The McRaes were Scots-Canadian farmers who had emigrated to Nelson in 1842 and by the 1870s were the largest landholders in the Awatere. William first took up Blairich on behalf of his father George McRae in 1848. He also selected runs in the Awatere for a number of other influential Nelson settlers. In 1850 he joined Lieutenant Impey, Jordan, Ewi and Eopi on an abortive exploration up the Awatere for a route south. Despite heavy snow McRae climbed to the top of the Seaward Kaikouras and saw the Clarence and what is now Lake McRae. William took up his own run Braes of Sutherland (Awapiri) in 1850 and employed a highlander named Roderick MacDonald as manager. Kennington states that MacDonald's cob dwelling which was a popular stopping place for travellers was built at the junction of the Jordan and the Awatere, just across the road from the present Awapiri homestead (Kennington, 1978). However this may not be correct as an 1862 survey map (LINZ Map SO 2935) of Braes of Sutherland by Frederick Huddleston shows the 'Old Station' as being situated on the McRae River near where the present road crosses it and shows the 'Braes of Sutherland Station' at the mouth of the Jordan Stream. On this basis the Jordan house appears to have been the second homestead and served as the Jordan Accommodation House until a purpose built establishment was opened 3 kilometres down river in 1886. The present Awapiri Homestead was built in 1905 by G E Parsons.

William McRae sold Braes of Sutherland to his brothers Philip and Nehemiah in 1855. This was the first of the various Awatere runs owned by these McRae brothers and by 1870 they were the largest sheepowners in Marlborough. In 1862 they acquired the neighbouring Hodder (Camden) Run and in 1867 Welds Hill. These runs and Braes of Sutherland were farmed from Welds Hill as a single entity. They also leased Mt Gladstone in 1862, Blairich in 1864 and Middlehurst in 1869 (Kennington, 1978). Nehemiah was drowned while crossing the Awatere in May 1872 and Philip, after buying out his interests, was left to shoulder the difficult conditions of the 1870s. Beset by increasing problems of scab, rabbits, low wool prices and large mortgages, Philip was forced to reduce his Awatere holdings but he still held all the country between the Medway and the Hodder Rivers into the early 1880s. However by 1887 increasing debt forced him to relinquish all his runs including Braes of Sutherland to the NZ Loan and Mercantile Company. This company transferred the property to the Bank of NZ in 1896 and it was taken over by the Assets Realization Board (Kennington, 1978). Unlike many other runs, none of Braes of Sutherland had been freeholded and it was resumed by the Crown following expiry of the lease in 1902. The lease was purchased at auction in 1903 by Robert E Bell who sold to G E Parsons in 1905. Parsons changed the name to Awapiri and as mentioned above, built the earliest part of the present homestead (Kennington,

1978). In 1912 Parsons sold to J. Dalziel and then in quick succession the run changed hands to J Elder in 1913, A and T Tomlinson in 1914, L.L.T Bush in 1920 who made substantial additions to the house, H.L Tapley in 1928 and R.J and B.D Landon-Lane in 1934. R.J Landon-Lane assumed sole ownership in 1946 and sold to E.L and J.L Peter in 1955. In 1966 it was sold to the present lessees Graham and Bev Black (Kennington, 1978). The Blacks long association with the run has seen the establishment of a merino stud and upgrading of the buildings, tracks and structures to improve farming this long narrow property.

Preliminary research, which included searching old SO plans now held by LINZ and the available publications and documents, gave good indications of where past structures and tracks had been on Awapiri.

## Awatere Sites

This was the main area of occupation during the settlement of the valley as it was the route used to access the upper Awatere Valley. This area had two homesteads present, one listed here and the other in the next section as it also has ties with that part.

'Old Station' site at the mouth of McRae Stream.

The building marked 'Old Station' on LINZ Map SO 2935 (1862) was somewhere in the vicinity of this location. LINZ Map SO 2935 (1862) also shows yards or a fenced enclosure lower down on the terrace. It is presumed that this was William McRae's Braes of Sutherland homestead. The terrace and the true left of McRae River to about 200 metres upstream of the road were very carefully inspected but no evidence of the old house or yards was found, although old bricks have been found on the terrace in the past (Graham Black *pers. comm.*). There are several large mounds of stones on the terrace which may result from past cultivation. The terrace was under thick grass which made observation difficult. It is also possible that road construction has destroyed the house site.

Old Road and Bridge site.

Evidence was found about 100 metres above the present road at the mouth of the McRae River while searching for evidence of the 'Old Station'. A loop of the old road including the crossing of the McRae has been isolated by the present road line. Apart from the old road formation there are cast concrete bridge abutments (single lane) remaining either side of the stream. These probably date to the first half of the 20$^{th}$ century.

## Jordan River Sites

Since the late 1850s or early 1860s the mouth of the Jordan Stream has been the location the Braes of Sutherland/ Awapiri Station homestead complex. It also played an important role as accommodation for travellers on the Awatere road.

Braes of Sutherland Homestead and Jordan Accommodation House Site

LINZ map SO 2935 (1862) clearly identifies this site at the mouth of Jordan Stream as 'Sutherland Station' and shows two buildings there. As discussed previously, this is believed to have been the second homestead on the station. Although the McRae brothers ran their holdings from Welds Hill they established a base at the Jordan on Braes of Sutherland sometime between purchasing from William McRae in 1855 and 1863. This Jordan homestead site is on a series of small terraces tucked under a hill on the true left of the Jordan River at its confluence with the Awatere River. It covers approximately one and a half hectares over the two upper terraces and is dominated by several large gum trees, an old willow and several apple trees. These trees are all historically significant as part of the homestead site setting. There are now no buildings at this site.

John Alexander Moore who worked for the McRae brothers on their Awatere holdings in 1872 has left this description of the homestead:

"Jordan Wharry is built of mud and thatched with toi toi. Is divided into four rooms. The kitchen at end nearest yards has cook's bunk and fireplace. Adjoining is where N McRae and I sleep (2 bunks) and any others, generally 2, sleep on the floor. There is another door leading to the other rooms – first same as kitchen- used as store room and the other room for men. It is situated on the bank of the Jordan Stream, and at the back is the paddock surrounded by gorse fence and on one side river (Awatere, which runs past the old garden) and yards at corner with dip and post rails, enclose the place. At the back of the Wharry is a small hill which forms part of the paddock. In the garden are peach and apple trees, bluegums and tussocks. It is about 8 miles from and faces Welds Hill" (King, *no date*).

This building served as homestead for at least 40 years and as de facto accommodation house for over 20 years. A 1950s photo shows the site with a wattle and daub house with an iron roof. It is not clear whether this is the same house or not. The photo also shows what may be the remains of an old cob oven to the left of the house and above it another building on the upper terrace.

LINZ Map SO 694 (1903) shows three buildings on this site; a 'Cottage' and two 'Whares'. The placement of these buildings suggests that the cottage was on the upper terrace with the whare on the lower terrace closer to the stream.

There is no clear surface evidence of either of the buildings shown in the 1950s photo. Kennington (1978) noted of the homestead that 'its moulded down remains are marked by a patch of periwinkle. Old benched vehicle tracks connect the terraces.

Dip Site

A whare, dip and yards are shown on LINZ Map SO 2468 (*no date*, before 1905) in the area currently occupied by Awapiri homestead. A photo taken in the 1950s by the Landon Lane family and held by the Blacks show the dip and tank at the edge of Jordan River. This low, rocky, river terrace, now overgrown with trees, was inspected but apart from a concrete pad no other evidence was found. The site is believed to have been cleared during J Peter's tenure, with any evidence of the dip gone by the time the Blacks took over the run in 1966 (Graham Black *pers. comm*.).

Rabbit- proof fence, Tomlinson's Saddle

This is late 19th century rabbit-proof fence built with T-iron posts and strainers, and iron standard posts. The fence has three wires and is fully netted. This fence is marked on the NZMS260 map which shows it running up to Mt Monro and then along the Awapiri/Camden boundary on the ridge between the Isis Stream and McRae River. The section from Mt Monro is of the same materials and specifications (Dave Wilkins *pers. comm*.). It is presumably this fence that Kennington refers to when he says that the only improvement on Awapiri at the time it was bought by Robert E Bell in 1903 'was a half share in 3.5 miles of fence between it and Camden' (Kennington, 1978). Despite its age the fence is still in use and has been repaired where necessary.

## Upper Medway Sites

The key site in the Upper Medway is the mid-run and mid-pack track hut Flynns Whare. Flynns Whare was superceded by Flynns Hut in 1973. The section of old rabbit proof fence at Tomlinson's Saddle was also recorded. A very old Lombardy poplar on a grassed flat just below Flynns Hut might also mark an old camp site

Flynns Whare

This hut was an integral component of the Awapiri Pack Track and was the base for managing the middle sections of Awapiri Station. The hut is situated on a small south facing, grassed terrace on a tight bend in the Medway River. It is about half a kilometre downstream from the newer Flynns Hut. The hut faces southeast and has a base area of 5 metres by 4 metres in plan. It is constructed of corrugated iron over pole and split beech framing. The door is in the centre of the southeast wall and there are two windows, one each in the southeast and southwest walls. The rear of the hut sits at the toe of the hill and at the edge of a pocket of beech forest.

This earth floored hut has seven bunks framed from pole beech with sacking over wire netting bases and there is a rough table on the southeast wall. The stone fireplace has collapsed and the iron chimney has gone leaving an opening in the northeast wall. The corrugated iron is 'Titan Best Trademark'. There has been a hut on this site at least since 1917 (LINZ Map SO 2214). It is likely that this is the original hut, although the earliest graffiti dates from 1954. There are artefacts scattered around the floor of the hut including a mattock head, a "D Donald, Masterton NZ" wire-strainer and assorted glass jars including 'Agee' and 'K' brand. The glazing from one window is missing. The hut is no longer used or maintained. It is in fair condition.

The grassed flat with Flynns Whare is about 30 metres long and has a pile of rock, which may be the remains of a fireplace, 10 metres southwest of the hut. There are also the beginnings of a benched pack track (see below) which zig zag up the hill immediately behind the hut. There is also a gooseberry bush at the northeast end of the hut.

Flynns Whare was replaced by the present Flynns Hut in 1973.

Flynns Hut

This hut was built by the Blacks after the road had been completed in 1973. It is on a more open site than the old hut which is about 500 metres downstream. It is a comfortable hut with 7 bunks and a Shacklock Orion Stove. The hut is built of flat iron cladding over pine framing and the roof is corrugated iron. The floor is tongue and groove as are the doors and the interior partitions are hardboard. It has three louvre windows.

Poplar Camp site?

About 100 metres below Flynns Hut is a substantial grassed flat with a large poplar at the upstream end. This flat was walked to check for any sign of a camp (fireplace or cleared tent site) but nothing obvious was found. It has not been used as a camp during the Blacks tenure (Graham Black *pers. comm.*).

Trig, Mt Malvern

This was described and photographed by another member of the survey party. The Mt Malvern trig is a hammered-in section of approximately two inch iron gas pipe and has an iron standard driven inside it (Dave Wilkins *pers. comm.*). This was a standard method of marking trigs in the late 19th early 20th century.

Boundary Fence Mt Malvern

This was described and photographed by another member of the survey party. This fence is a six wire T-iron and standard fence (Dave Wilkins *pers. comm.*). It is likely to date from the late 19th century. The fence has remained largely intact, although repaired, and the old straining bolts can be seen on strainer posts.

## Upper Swale Valley sites

The Upper Swale Valley is in the Clarence watershed and thus across the Inland Kaikoura Range from the main part of Awapiri Station Pastoral Lease. Key historic elements are the formed pack track which provides access, and Swale Hut site which is generally the base from which this country has been worked. The original Swale Hut was replaced by the Blacks in 1977. The Awapiri Pack Track terminates at Swale Hut although it is probable that some horse travellers continued through the gorge between the Chalk Range and Mead Hill to Coverham and the horse routes in the Clarence Valley. The only other feature noted on early plans, and surveyed for, was yards ona small flat at the top of a tributary of Swale Stream. These were subsequently removed by J Peter prior to his sale to the Blacks in 1966 (Graham Black *pers. comm.*).

Awapiri Pack Track

This formed pack track is potentially a very old feature and originally ran from the homestead at the mouth of the Jordan River to Swale Hut. It followed the True Left of Jordan River before crossing its

first major branch and climbing to Tomahawk Saddle. It then skirted the head of the Jordan River to Tomlinson's Saddle before dropping into the head of the Medway River at Flynns Whare. From Flynns Whare it sidles up across the headwaters of the Medway River to a saddle on the Inland Kaikoura Range between Black Mount and Mt Malvern. This saddle is known to the Black family as 'Pack Track Saddle'. It then drops down a steep spur in a series of tight zig zags to a small flat in the valley floor in the upper reaches a tributary of Swale Stream. From this small flat, the pack track originally followed the ridge on the true right of the tributary to Swale Hut. This section has been replaced by a later horse track down the true left. The original track is now used as a stock track. The pack track was in existence prior to its survey in 1917 (it was being upgraded at that time) and its subsequent gazettal as Legal Road in 1918 (NZ Gazette 1918). Graham Black believes that the track was further upgraded in the about 1921 using unemployed labour. Ned West, the then lessee of Welds Hill, supervised this work Graham Black *pers. comm*.).

The section of track from the Jordan River to Flynns Hut has been superceded by a bulldozed 4WD track that was put in by the Blacks over three winters and completed in 1973. The road does not follow the line of the old pack track and trace of this is difficult to see now. This section was not surveyed for remnants of the pack track, but is commented on Section 1 below.

The pack track from a small flat about one kilometre past Flynns Hut to Swale Hut is still used by the Blacks. It is only used by horse or on foot and stock is not driven along it to conserve the formation.

The character of the track varies according to the country it negotiates. For the purposes of this report, it has been broken it into four sections.

Section 1: Flynns Whare to Tomlinson's Saddle.
This section has been isolated by the construction of the bulldozed road and Flynns Hut and is no longer used. It runs from immediately behind Flynns Whare, climbing the small spur before sidling into the small tributary of the Medway River. It sidles up the true right of this tributary then crosses to the true left before reaching the ridge crest at the head of the tributary. It then contours around the ridge to Tomlinson's Saddle. Parts of the track can be seen from the bulldozed track across the main Medway River from Flynns Whare.

Section 2: Flynns Hut to 'Pack Track Saddle'.
The pack track begins at the end of the bulldozed track about one kilometre beyond Flynns Hut. The track is a subtle but visible bench in the grass and takes a steady but generally easy rising line across the faces and through various gullies around the head of the Medway River to just below the saddle. It then zig zags up a grassed shoulder to a point on the ridge just west of the saddle where it traverses about 100 metres down the ridge to the saddle. Apart from the track formation, the only structures noted were several cairns marking corners. These were built by an employee of the Blacks several years ago (Graham Black *pers. comm*.).

Section 3: 'Pack Track Saddle' to the flat in Swale Stream tributary.
From the saddle the track descends a steep shoulder in a series of tight zig zags to the head of a tributary of Swale Stream and a small stony flat. The zig zag is well benched and trenched through use. In one eroding stretch a line of placed retaining rocks were noted. From the base of the zig zag the track follows an indistinct route down the stream bed and across the flat although several cairns were noted. LINZ Map SO 2214 (1917) has yards marked on this flat. No clear sign of these was found although 3 old fence standards were noted near the bottom of the flat which may be remnants of the yards or an old camp.

Section 4: Flat in Swale Stream tributary to Swale Hut.
The entrance to the track from the flat is marked by an old fence standard. The track from here to the hut runs through beech forest on the true left of the stream, is well benched and approximately one

metre wide. There are two small watercourses with horse crossings of placed stones. The line of the original track down the true right is visible but was not surveyed.

Swale Hut

Swale Hut is sited on a small grassed terrace on the true left of the Swale Stream.
This southern end of Awapiri is the most isolated part of the run and Swale Hut acts as an outstation from which it has been worked. A hut is shown here on the 1917 plan (LINZ Map SO 2214) and geologist J Allan Thomson records spending two days "at the Awapiri out-station in the upper valley of the Swale" during his survey of Clarence geology in 1919 (Thomson 1919). Immediately south of the hut there was a shed. There was also a shearing/crutching shelter at the edge of the bush directly above the hut (Thomson 1919). The original hut, shed and shearing shelter have gone.

The old hut, which had pole beech framing, was demolished and replaced by the present hut in 1977. The new hut was prefabricated by NZ Forest Service carpenter Tony Wallace (Graham Black *pers. comm.*). It is a comfortable six bunk hut measuring six metres by four metres, clad in corrugated iron over P. radiata framing. The iron cladding has been recycled from the original Swale Hut (Titan Best Trademark) and has been applied horizontally as it was on the original. It has a chipboard floor.

The hut sits on the site of the earlier one and there is an old concrete fireplace at the north end of the hut which probably belongs to the older hut. There is also a discarded Shacklock 'Orion' Stove next to it. To the south of the hut are various pieces of old iron (presumably from the original hut, and old tins and rubbish have been discarded over the edge of the terrace. It is likely that this site contains other less visible archaeological evidence relating to its use over the past100 years.

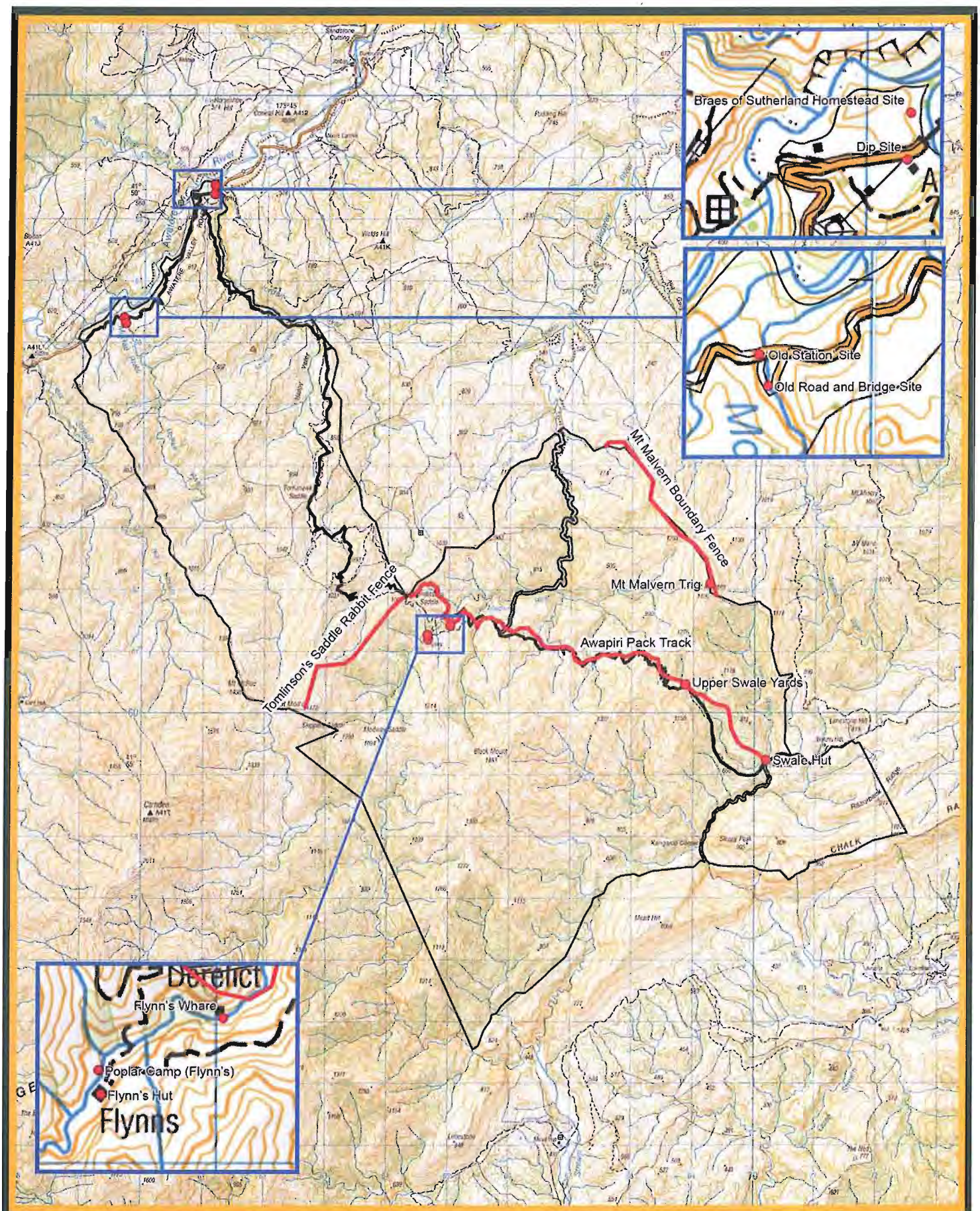
Swale Hut is the southern terminus of the Awapiri Pack Track

## Significance of Historic Resources

The historic sites of greatest significant inherent value on Awapiri Station Pastoral Lease are:
- Awapiri Pack Track between Tomlinsons's Saddle and Swale Hut;
- Swale Hut;
- Flynn's Whare;
- Braes of Sutherland Homestead Site;
- Old Station site.

Of moderate to low significant inherent value are:
- Flynns Hut;
- Upper Swale yards;
- Poplar Camp;
- Old fences with T iron strainers and standards including Tomlinson's saddle/ Mt Monro Rabbit and boundary fence, Mt Malvern boundary fence;
- Mt Malvern Trig;
- Dip Site;
- Old Road and bridge site.

Historic Values Map




# Historic Values - Awapiri Station Pastoral Lease
# Conservation Resources Report 2010

Department of Conservation
*Te Papa Atawhai*

New Zealand Government

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Kilometres

**Legend**

- Awapiri Station Pastoral Lease
- Awapiri Station Historic Sites
- Awapiri Station Historic Features

Base map - LINZ topographic series
Cadastre - LINZ February 2010

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Canterbury Conservancy - Tenure Review

8 October 2010

# 2.8 PUBLIC RECREATION

## 2.8.1 Physical Characteristics

Most of the property comprises moderately steep hill country with higher summits at the centre of the property, between the Awatere and Clarence valleys. The southeast part of the property is quite different in character, with the steep-sided Chalk Range and deeply incised streams. Most of the property can be easily traversed on foot. One main vehicle track traverses the property from the Awatere Valley Road to just beyond Flynns Hut in the Medway valley. A well-formed graded pack track continues from this road-end, across the saddle between Mt Malvern and Black Mount, to Swale Stream near the southeast property boundary. The property lies at the north end of the inland Kaikoura Range and is typical of the broken country of this part of South Marlborough.

## 2.8.2 Legal Access

### Roads

Access to the property is from Seddon via the Awatere Valley Road. Unformed legal access to the property is delineated along the Medway River and Swale Stream, though neither provides practical access. A legal road bisects the property, following the approximate alignment of the vehicle track and pack track between the Awatere River and Swale Stream via Tomlinsons Saddle and the saddle between Mt Malvern and Black Mount.

### Adjoining Public Conservation Land

The property adjoins Mead Block Conservation Area to the southwest, Camden Pastoral Lease to the west, and privately-owned (freehold) land on all other boundaries.

### Marginal Strips

Marginal strips are present within or adjacent to the property along the Awatere, Jordan and Medway rivers, and along Swale Stream. These are Section 58 strips (Land Act) that have been deemed appropriate under the Section 24 (3) of the Conservation Act.

## 2.8.3 Activities

Likely existing recreational activities may include hunting, horse-riding and tramping. Higher-altitude parts of the property provide good opportunities for tramping, hunting, nature study and scenery appreciation. Lower-altitude parts of the property, including the vehicle track provide good opportunities for horse-riding, mountain-biking, four-wheel-driving, picnicking and nature study. The pack-track is a special feature. It provides a well-graded and formed track through a particular scenic part of the property and provides excellent foot access between the Medway and Swale valleys.

### Significance of Recreation

Significant recreational features of Awapiri Station Pastoral Lease is the semi-natural recreation setting, especially in southeast and higher-altitude parts of the property, the intact indigenous vegetation (forest, shrubland and herbfield/rockland) in the Swale and Mead valleys and the attractive scenery of the southeast part of the property, including the Chalk Range. The pack track between the Medway and Swale valleys is a special feature.

# PART 3 OTHER RELEVANT MATTERS AND PLANS

## 3.1 CONSULTATION

A request for interested party (NGO) comment was sent on the 3/3/2010. Interested party comments were received from New Zealand Historic Places Trust. The comments are listed below.

- There is a registered historic place called the Jordan Accomodation House (Former) in the Awatere Valley (NZHPT Record number 2924). The exact location is unclear but there is the possibility it occurs on Awapiri Station Pastoral Lease. This is a heritage item listed in the Wairau/Awatere Resource Management Plan.

- There are no registered historic areas, wāhi tapu or wāhi tapu areas in the area.

- There are no archaeological sites recorded in the New Zealand Archaeological Association (NZAA) Site Recording Scheme in the immediate area of the lease. This should not be taken as evidence that no sites are present however, as a systematic survey has not been undertaken.

- Awapiri Station Pastoral Lease has a history dating back to the mid-nineteenth century; and there are a number of historic huts, cob whare, homesteads, pastoral farming structures and artefacts that are known to have been present at some time.

- Run 209 was formally Small Grazing Run 193.

## 3.2 DISTRICT PLANS

Awapiri Station Pastoral Lease lies within Marlborough District. The relevant district plan forms part of the Wairau Awatere Resource Management (RM) plan. The Wairau Awatere RM plan is a combined district, regional coastal and regional plan prepared by a unitary council. This plan applies to that part of the district located south of the Wairau River catchment, including the Awatere Valley where this property is located. The Wairau Awatere RM plan became operative on 8 February 2008.

The property is zoned Rural 4 under the Wairau Awatere Resource Management Plan. Under this zoning farming, commercial forestry and protection and conservation forestry are permitted activities. The zoning also allows for home occupations, homestays and one dwelling house per certificate of title as permitted activities. Subdivision is a controlled activity in the Rural 4 zone to a minimum lot size of 20 hectares net site area (excluding access).

The plan has an indigenous forest clearance rule which would require resource consent for clearance of an area of more than 0.1 ha of indigenous forest from any certificate of title, in any twelve month period. It also requires a resource consent for the removal of any indigenous vegetation from a natural wetland which as an area of larger than 200 m2. Other indigenous vegetation types are not subject to any plan rule which would prevent their destruction or removal.

The plan requires resource consent for:

- clearance of any woody vegetation;
- cultivation on all slopes greater than $20^{O}$;
- excavation and tracking, and filling of land within 8 metres of any permanently flowing river, or the margin of any wetland.

The permitted activity rules are subject to a number of specific conditions. Non-compliance with these conditions makes an activity a limited discretionary activity.

The plan includes a chapter on landscape values. This chapter has a focus on visual amenity, in particular on the identification of outstanding landscape values in accordance with 6 b of the RMA, "the protection of outstanding natural features and landscapes from inappropriate subdivision, use and development". This chapter identifies the property as being part of a landscape type classified as “high inland hills” which features river gorges and contains medium high and high visual qualities for the river gorges. The area is identified as having outstanding values with medium low landscape sensitivity generally and medium sensitivity within the river gorges. The identification of the area as having outstanding landscape value does not change the activity status of activities and structures. Council would be required to take this matter into consideration when assessing applications for discretionary and non-complying resource consents.

The Council has recently commissioned and received a landscape study that encompasses all of Marlborough including Awapiri Station Pastoral Lease. The study was circulated to various organisations for comment. The document (Marlborough Landscape Study 2009 Landscape characterisation First Draft Boffa Miskell May 2009) was prepared to assist in the review of the Marlborough Resource Management Plans. It has no legal or statutory weight.

A register of significant heritage resources is included in the plan as Appendix A. There do not appear to be any heritage trees or buildings identified within the property.

## 3.3 CONSERVATION MANAGEMENT STRATEGIES

Awapiri Station Pastoral Lease lies within the South Marlborough part of Nelson-Marlborough Conservancy. Relevant priority objectives for this unit listed in the CMS (Department of Conservation, 1996) are:

- Identify and protect traditional falcon nesting sites in Inland Marlborough.
- Control goats to protect endemic plants in Inland Marlborough.
- Ensure maintenance of historic buildings and provide appropriate interpretation.
- Survey for freshwater fish throughout.
- Investigate the effect of hares and control where required.
- Survey and provide interpretation in conjunction with facilities at historic sites.
- Negotiate access and provide for remote tussockland tramping in Inland Marlborough.
- Maintain facilities and seek opportunities to improve access for recreational hunting, particularly in the Branch and Leatham catchments but also elsewhere in South Marlborough.
- Seek controls on land clearance and prevent fire in Inland Marlborough.
- Protect freshwater fish habitat through statutory advocacy.

## 3.4 NEW ZEALAND BIODIVERSITY STRATEGY

The New Zealand Government is a signatory to the Convention on Biological Diversity. In February 2000, Government released the New Zealand Biodiversity Strategy. This strategy is a blueprint for managing the country’s diversity of species and habitats. It sets a number of goals to achieve this aim. Of particular relevance to tenure review is Goal 3, which states:

- *Maintain and restore a full range of remaining natural habitats and ecosystems to a healthy functioning state, enhance critically scarce habitats, and sustain the more modified systems in production and urban environments, and do what is necessary to:*

- *Maintain and restore viable populations of all indigenous species across their natural range and maintain their genetic diversity.*

# PART 4 ATTACHMENTS

## 4.1 ADDITIONAL INFORMATION

### 4.1.1 Scientific Names of Species

#### Plant Species

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

Common name ..... Scientific name
Naturalised species are indicated by an asterisk (*).

akiraho ..... *Olearia paniculata*
beech/tawhai ..... *Nothofagus* spp.
bidibid ..... *Acaena* sp.
black beech ..... *Nothofagus solandri*
blue tussock ..... *Poa colensoi*
bog rush ..... *Schoenus pauciflorus*
bracken ..... *Pteridium esculentum*
bristle tussock ..... *Rytidosperma setifolium*
broad-leaved snow-tussock ..... *Chionochloa flavescens*
browntop* ..... *Agrostis capillaris*
bush lawyer ..... *Rubus cissoides*
cabbage tree/ti rakau ..... *Cordyline australis*
carpet grass ..... *Chionochloa australis*
catsear* ..... *Hypochoeris radicata*
Chewings fescue* ..... *Festuca rubra*
cotton daisy/tikumu ..... *Celmisia spectabilis*
crack willow* ..... *Salix fragilis*
creeping pohuehue ..... *Muehlenbeckia axillaris*
dog daisy* ..... *Leucanthemum vulgare*
five-finger ..... *Pseudopanax arboreus*
flax/harakeke ..... *Phormium tenax*
golden speargrass/taramea ..... *Aciphylla aurea*
gooseberry* ..... *Ribes uva-crispa*
hanging spleenwort ..... *Asplenium flaccidum*
hard tussock ..... *Festuca* spp.
harebell ..... *Wahlenbergia albomarginata*
hawkweed* ..... *Hieracium* sp.
hookgrass ..... *Uncinia* sp.
horehound* ..... *Marrubium vulgare*
jointed rush* ..... *Juncus articulatus*
kanuka ..... *Kunzea ericoides*
kapuka/broadleaf ..... *Griselinia littoralis*

kiokio ..... *Blechnum novae-zelandiae*
kohuhu ..... *Pittosporum tenuifolium*
korokio ..... *Corokia cotoneaster*
koromiko ..... *Hebe salicifolia*
kowhai ..... *Sophora microphylla*
lancewood ..... *Pseudopanax crassifolius*
lawyer ..... *Rubus schmidelioides*
Lombardy poplar* ..... *Populus nigra*
lotus* ..... *Lotus pedunculatus*
manuka ..... *Leptospermum scoparium*
marbleleaf ..... *Carpodetus serratus*
Marlborough rock daisy ..... *Pachystegia insignis*
matagouri ..... *Discaria toumatou*
matai ..... *Prumnopitys taxifolia*
midribbed snow-tussock ..... *Chionochloa pallens*
mountain beech ..... *Nothofagus solandri* var. *cliffortioides*
mountain clubmoss ..... *Lycopodium fastigiatum*
mountain inaka ..... *Dracophyllum rosmarinifolium*
mountain kiokio ..... *Blechnum montanum*
mountain ribbonwood/houhi ..... *Hoheria lyallii*
mountain tauhinu ..... *Ozothamnus vauvilliersii*
mountain totara ..... *Podocarpus hallii*
mountain wineberry ..... *Aristotelia fruticosa*
mouse-ear hawkweed* ..... *Hieracium pilosella*
native violet ..... *Viola cunninghamii*
necklace fern ..... *Asplenium flabellifolium*
nettle ..... *Urtica* sp.
patotara ..... *Leucopogon fraseri*
pine* ..... *Pinus* spp.
pink broom ..... *Carmichaelia glabrescens*
pohuehue ..... *Muehlenbeckia australis*
poplar* ..... *Populus* sp.
porcupine shrub ..... *Melicytus alpinus*
prickly mingimingi ..... *Leptocophylla juniperina*
prickly shield fern ..... *Polystichum vestitum*
prostrate kowhai ..... *Sophora prostrata*
red beech ..... *Nothofagus fusca*
red woodrush ..... *Luzula rufa*
scrub pohuehue ..... *Muehlenbeckia complexa*
sheep's sorrel* ..... *Rumex acetosella*
silver tussock/wi ..... *Poa cita*
slim snow-tussock ..... *Chionochloa macra*
snowberry ..... *Gaultheria depressa*
snow totara ..... *Podocarpus nivalis*
speargrass/taramea ..... *Aciphylla* sp.
swamp kiokio ..... *Blechnum minus*
sweet brier* ..... *Rosa rubiginosa*
sweet vernal* ..... *Anthoxanthum odoratum*
tauhinu ..... *Ozothamnus leptophyllus*
thousand-leaved fern ..... *Hypolepis millefolium*
three-finger ..... *Pseudopanax colensoi*
toetoe ..... *Cortaderia richardii*
tree fuchsia/kotukutuku ..... *Fuchsia excorticata*
tutu ..... *Coriaria sarmentosa*
vetch* ..... *Vicia sativa*

viper's bugloss*.....*Echium vulgare*
wall lettuce*.....*Mycelis muralis*
weeping broom .....*Carmichaelia stevensonii*
weeping mapou .....*Myrsine divaricata*
whaririki/mountain flax.....*Phormium cookianum*
white clover* .....*Trifolium repens*
white fuzzweed.....*Vittadinia australis*
wilding pine*.....see pine*
willow .....*Salix* spp.
wire moss.....*Polytrichum juniperinum*
woolly moss.....*Racomitrium pruinosum*
woolly mullein*.....*Verbascum thapsus*
Yorkshire fog*.....*Holcus lanatus*

## Animal Species

Species names follow King (1990) for mammals, Miskelly *et al* 2008 for recent bird name changes and 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 the other bird names, Whitaker (1998) for lizards, McDowall (2000) for fish and Scott and Emberson (1999) for invertebrates. Maori names are included for taonga species listed in Schedule 97 of the Ngai Tahu Claims Settlement Act 1998. Naturalised species are indicated by an asterisk (*).

Common name ..... Scientific name

Australian magpie* .....*Gymnorhina tibicen*
bellbird/korimako.....*Anthornis melanura melanura*
blackbird*.....*Turdus merula*
black-eyed gecko.....*Hoplodactylus kahutarae*
bluff weta .....*Deinacrida elegans*
brown creeper.....*Mohoua novaeseelandiae*
brown trout* .....*Salmo trutta*
California quail*.....*Callipepla californica brunnescens*
Canterbury galaxias.....*Galaxias vulgaris*
chaffinch*.....*Fringilla coelebs*
common skink .....*Oligosoma nigriplantare polychroma*
deer*.....*Cervus elaphus scoticus*
dunnock* .....*Prunella modularis*
eastern falcon/karearea.....*Falco novaeseelandiae*
forest gecko .....*Hoplodactylus granulatus*
goat*.....*Capra hircus*
goldfinch* .....*Carduelis carduelis*
greenfinch*.....*Carduelis chloris*
grey warbler/rironiro.....*Gerygone igata*
hare*.....*Lepus europaeus occidentalis*
Kaikouras gecko.....*Hoplodactylus* aff. *maculatus* "Kaikouras"
kea .....*Nestor notabilis*
kereru/New Zealand pigeon .....*Hemiphaga novaeseelandiae novaeseelandiae*
kingfisher.....*Todiramphus sanctus vagans*
koaro.....*Galaxias brevipinnis*
longfin eel/tuna.....*Anguilla dieffenbachii*
long-toed skink.....*Oligosoma longipes*
mallard*.....*Anas platyrhynchos platyrhynchos*
Marlborough giant weta .....*Deinacrida parva*
Marlborough mini gecko.....*Hoplodactylus* aff. *maculatus* "Marlborough mini"

New Zealand pipit/pihoihoi.....*Anthus novaeseelandiae novaeseelandiae*
northern flathead galaxias .....*Galaxias* "Northern"
paradise shelduck/putakitaki .....*Tadorna variegata*
pig*.....*Sus scrofa*
possum*.....*Trichosurus vulpecula*
redfin bully.....*Gobiomorphus huttoni*
redpoll* .....*Carduelis flammea*
rough gecko.....*Heteropholis rudis*
scree skink.....*Oligosoma waimatense*
scree weta.....*Deinacrida connectens*
sheep*.....*Ovis aries*
shining cuckoo/pipiwharauroa .....*Chrysococcyx lucidus lucidus*
shortfin eel.....*Anguilla australis*
silvereye .....*Zosterops lateralis lateralis*
skylark*.....*Alauda arvensis*
song thrush* .....*Turdus philomelos*
Southern Alps gecko .....*Hoplodactylus* aff. *maculatus* "Southern Alps"
southern black-backed gull/karoro .....*Larus dominicanus dominicanus*
South Island fantail/piwakawaka.....*Rhipidura fuliginosa fuliginosa*
South Island rifleman/titipounamu.....*Acanthisitta chloris chloris*
South Island robin/kakaruai .....*Petroica australis australis*
South Island tomtit/miromiro.....*Petroica macrocephala macrocephala*
spotted skink.....*Oligosoma lineoocellatum*
starling*.....*Sturnus vulgaris*
swamp harrier/kahu.....*Circus approximans*
torrentfish/piripiripohatu .....*Cheimarrichthys fosteri*
upland bully.....*Gobiomorphus breviceps*
welcome swallow.....*Hirundo tahitica neoxena*
yellowhammer*.....*Emberiza cintrenella*

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