

## **Crown Pastoral Land Tenure Review**

**Lease name : REDCLIFFE**

**Lease number : PC 141**

### **Conservation Resources Report**

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

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

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

**June 05**

## **Conservation resources of Redcliffe Pastoral Lease, Canterbury**

*Department of Conservation report on Tenure Review of Redcliffe under Part 2 Crown Pastoral Land Act*

9 February, 1999

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### **PART 1**

#### **1.1 INTRODUCTION**

Redcliffe pastoral lease covers 9,192 hectares of land on the southern banks of the Rakaia River between the junction with the Wilberforce River and the Rakaia Gorge. A central piece of the property of around 4940 hectares of the Mount Hutt Range has been retired and is to be surrendered once cadastral survey is complete. The area left over, once surrender is complete, is the only area that was assessed for tenure review, on the understanding that the retired area would in the future be administered by the Department of Conservation.

Land adjoining to the east is Mount Hutt Forest (administered by DoC) and freehold (Cleardale), to the west Glenrock and Winterslow pastoral leases, to the north Redcliffe freehold (approx. 625 ha) and Crown river bed (Rakaia River). In the south-west is Unoccupied Crown land, formerly Winterslow POL and to the south of Waterfall Creek, Unoccupied Crown land, formerly Glenrock pastoral lease from an earlier retirement plan.

The property lies within the Mt Hutt Ecological District, which was surveyed as part of the PNA Programme in 1989 (Arand and Glenny 1990). One whole and one part RAPs were identified on the property - Mt Hutt RAP 7 (Hutt Stream Fan), Mt Hutt 21 (Steepface Hill),

Other pastoral leases in the vicinity that are undergoing tenure review include Double Hill, Glenarriffe and Glenrock to the west, Peak Hill to the north immediately across the Rakaia River and Mt Alford to the south.

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

#### **2.1 Landscape**

##### **2.1.1 Context - the Hutt District**

The Mt Hutt Ecological District in which Redcliffe lies, is a large compact area of dissected greywacke mountain ranges on the eastern edge of the mid-Canterbury high country. This area has been identified as regionally significant natural landscape in the only comprehensive landscape study of the Canterbury region (BMP and LA 1993).

The area has a highly natural landscape character. Obvious human modification is largely limited to the lower slopes, fans, terraces and river flats around the perimeter of the district.

Whilst the interior of the district is considered to be of limited significance to the wider mid-Canterbury area (because it is largely hidden from view and having no recognised public access or recreation areas), the perimeter ranges are considered to be highly significant. The ranges on the eastern side form a dramatic, highly visible mountain backdrop to the Canterbury plains, one of the most characteristic features of Canterbury. The northern edge forms the spectacular glaciated setting for the braided Rakaia river. Only the Rakaia River and its wide gravel bed are an outstanding natural landscape in the 1993 BMP and LA Canterbury Regional Landscape Study.

## **2.1.2 Landscape Description**

### **2.1.2.1 Introduction**

Redcliffe pastoral lease is virtually all within one landscape type - the Front Range Landscape Type according to Boffa Miskell and Lucas Associates classification of Canterbury landscapes. The property however, also includes a narrow 3 km long strip of the Rakaia riverbed at the foot of Steepface Hill. This is part of the “Intermontane Ranges and Basins Landscape Type” (BMP and LA 1993).

### **2.1.2.2 Front Range Landscape Type**

This landscape type is characterised by very steep and dissected Torlesse greywacke/argillite mountain ranges rising to over 2000m asl with extensive scree and rock outcrop. Most of this landscape type has been shaped by minor cirque glaciation, fluvial and slope processes. Glaciation has not been a major landshaping influence on the property except the northern perimeter/Rakaia valley side slopes which have been extensively glaciated. The predominant vegetative cover is snow tussock, induced short tussock/hieracium grasslands and native shrubland communities. Small remnants of beech and mixed hardwood forest remain in deep valleys and around rock bluffs and scree.

The landscape is highly natural in character. Obvious human modifications are largely limited to the lowest slopes and flatter land on the periphery of the district, associated with homestead areas.

The strong contrast between the steep rugged mountainous ranges often topped in snow and the highly modified plains immediately adjacent, with the absence of a transition landscape, is highly characteristic of this landscape type.

Within this broad landscape type, 7 separate landscape units can be identified on Redcliffe pastoral lease. These are shown on Map Two and are described in the following sections.

## **Landscape Units of Front Range Landscape Type**

### *1. Rakaia Faces*

This unit comprises the formerly glaciated mountain slopes of the north end of the Mt Hutt range, facing the Rakaia river. It includes Jack Stream valley, Terrible Gully, Hutt Stream valley and Little River Valley. Large alluvial fans spill out from these deep valleys, which have been cut by the streams that form them. They typically have truncated edges due to the eroding action of the Rakaia river, resulting in high gravel cliffs. Many of these fans are cultivated including the fan at Hutt Stream on Redcliffe pastoral lease.

Between these valleys are long, very steep mountain slopes, often with extensive bedrock exposure and scree, and long, narrow steep-sided gullies and scree chutes incised into the slope's surface.

Generally open snow tussock and induced short tussock grasslands are the predominant vegetation cover, with native shrublands in gullies and around rock outcrops. Exotic pasture species, bracken and sweet briar are common.

The Rakaia faces appear natural in landscape character, except some of the lower slopes which have been divided off by visible fencelines

### *2. Redcliffe Basin*

Rat Hill and the northwest corner of Steepface Hill on Redcliffe lease enclose Redcliffe basin on its east side. The Redcliffe basin is a small, linear 7km long by 1-1.5km wide, downfaulted intermontane basin with a floor altitude of 800-1000m asl. The basin floor itself is on a neighbouring property, Glenrock.

The enclosing mountain slopes of Rat Hill are typical of the Hutt district. They are steep, planar slopes dissected by numerous side streams. Alluvial fans spread out over the basin floor at their foot, some with matagouri. Open snow tussock, with dracophyllum shrubs on shady faces intermixed with extensive scree and bare rock increasingly dominate mid to upper slopes. On the crest, however dense snow tussock and cotton daisy is marked. The lowest slopes and valley floor are covered in short tussock and cotton daisy, matagouri and cassinia, with prostrate woody native shrubs. Remnant snow tussock and flax occur dotted through it. Overall tussock cover is noticeably depleted with extensive hieracium in places.

The floor of Redcliffe basin at its northern end is deeply dissected by Cascade Glen and Redcliffe Stream. Regenerating mixed shrublands and remnant beech and mixed hardwood species forest are extensive on the true left of the stream but much of the Redcliffe side has been cleared for grazing except for larger areas of shrublands and kowhai groves downstream of the Jack Stream confluence.

Overall the valley appears highly natural. The only obvious cultural modifications are two 4WD tracks passing through the valley (on Glenrock) and the Glenrock-Redcliffe

boundary fence. Pasture improvement is obvious on the hill face southwest of Jack Stream and on the basin floor.

3. *Steepface Hill (south side)*

This unit largely comprises the west and south-facing slopes of Steepface Hill, forming the headwaters of the Swift River. Most of this unit is on adjacent retired land. It is distinguished by three long narrow cirque basin/rock glacier features and by the extensive, relatively dense snow tussock cover on long planar slopes. Rock outcrop, scree and shrublands are markedly absent from mid to lower slopes resulting in a smooth simple appearance not existing to this degree elsewhere on the property.

The prominent saddle between Rat Hill and Steepface Hill is part of this unit. Its snow tussock cover is visually continuous with that up on Steepface Hill.

This is a landscape of highly natural character. There are no obvious cultural modifications.

The higher altitude slopes of this unit are retired although not fenced off and are to be surrendered.

4. *Upper Swift and Snowy Stream Catchment*

This unit comprises steep, deeply dissected mountainous country characterised by extensive scree and rock outcrop, forming a visual mosaic of surface cover over all the slopes. Vegetation is typical of the district, ranging from snow tussock to induced and generally degraded short tussock/hieracium on the lower slopes with a lot of cotton daisy. Varied subalpine shrub species are dispersed throughout, with ribbonwoods and flax in gullies at lower levels.

The Swift River gorge, situated between Rat Hill and Mt Hecla, is a subunit within this unit. It is a small deep winding gorge cut into bed rock. The gorge sides are very steep and rugged with a rich variety of subalpine shrub species, totara trees, and prominent rock strata exposures. The river bed is narrow with alternating rapids and deep pools. A natural rock arch exists over the river in one place.

There no apparent human modification of this area, with the exception of a small hut in the Swift river bed, and it has a highly natural appearance.

Most of this unit above 1300m is already retired, and is to be surrendered, although it is not fenced off.

5. *Swift River Valley*

This is a 4.5 km long straight open river valley enclosed by Mt Hecla on the east side and the southern end of Shingle Hill range on the west side.

The west-facing side of Mt Hecla is basically a large triangular planar face dissected by several smaller and one large gully. Its altitude ranges from around 700-1800m asl.

Surface cover is typical of the district although the upslope extent of induced and degraded short tussock/hieracium cover appears to be greater here than other parts of the property. "Grey" scrub (matagouri/coprosma/olearia) with associated ribbonwood groves is common in gullies and on alluvial fans where it can form dense thickets.

The Swift river occupies a moderately wide, aggrading gravel/boulder bed.

There is no apparent human modification of this area and it has a highly natural appearance.

#### 6. *Lower Swift-Ashburton River (North Branch) Valley and Gorge*

This unit comprises the lower more hilly country forming the true left of the Swift and Ashburton River, between Cookies Hut and Waterfall Creek, a distance of about 6km.

The rivers have cut down through bedrock to form a reasonably large gorge. The Swift River part of the gorge is fairly open, merging with open gravel riverbed at the confluence with the Ashburton. Downstream however the gorge narrows markedly, and the river is hemmed in by high rock walls. Diverse native shrub and forest species including manuka, ribbonwoods, totara, broadleaf, beech and lancewood cover parts of the steep, rugged rocky valley side walls. There is some sweet briar and gorse in the riverbed.

Above the riparian/gorge zone, short tussock/hieracium and native shrublands (matagouri, coprosma, manuka) are the predominant cover. Rock outcrops and scree are also widespread.

Cultural modifications are absent and the area retains a highly natural appearance.

#### 7. *Waterfall Creek*

This is a well-defined catchment at the south end of the lease, running southwest off Mt Bruce at the juncture of Pudding Hill and the Mt Hutt Range. Altitude ranges from just over 1800m down to about 600m asl. It is a rugged, steep, well-dissected catchment with a rich mosaic of surface cover including extensive scree, rock bluffs, vegetable sheep colonies, snow tussock, short tussock, "grey" and mixed shrublands, and remnant beech and mixed hardwood species forest.

The upper true right and the left (southeast) side of the catchment is already retired although stock can still access the area.

Waterfall Creek has no obvious human modification and appears highly natural. Clear natural vegetation patterns related to aspect and altitude remain despite past modification through grazing and burning.

### **2.1.2. Major River Land type - the Rakaia Riverbed**

This is a flat, largely stable older floodplain and includes a number of low angle alluvial fans well-clothed in dense matagouri shrubland, gorse, broom and sweet briar interspersed with short tussock/browntop grassland. Yellow lupins and verbascum are widespread. Kowhai and cabbage trees are also common. The Double Hill Run Road traverses this area.

### **2.1.3 Visual values**

Much of Redcliffe pastoral lease is hidden from public view by its elevation, the Mt Hutt Range and Steepface Hill. The Rakaia faces however are highly visible from a number of public viewpoints and are of high visual significance. The very steep, planar nature and huge scale of the landforms with a predominantly low grassland cover means they are also highly sensitive to visual change.

There are spectacular, full, detailed views of all of the Rakaia faces from the Coleridge, Homestead, Algidus and Intake roads. They form a large part of a grand mountain panorama in this area, and the setting for the outstanding Rakaia river. These views are enhanced by the elevated location of these roads immediately across the Rakaia river from the faces. This view gradually changes on progression further inland, revealing the three broadly distinct mountain "blocks" of the Mt Hutt Range, Black Hill and the Palmer Range that form the south side of the Rakaia valley.

The visual contrast between the highly developed fans, terraces and river flats and the mountain slopes immediately above is similarly striking to the contrast further east on the Plains (although on a smaller scale).

The huge scale and steepness of the landforms, the degree of definition of their glaciated form, the extent of eroding bedrock, visible rock strata and scree, and the virtual absence of visually fragmenting modifications (such as fencelines) are considered the most significant visual attributes of the Rakaia faces.

Similar views are likely to exist from the Rakaia riverbed, a popular recreation area.

The mountain slopes southeast of Steepface Hill (ie, the northeastern face of the Mt Hutt Range) are in direct and increasingly closer view from the Hororata-Windwhistle Road and from SH72 as it approaches the Rakaia Gorge from the east. They form the dramatic mountain backdrop to the plains, striking for its extreme visual and physical contrast and for its apparently continuous natural character over the visible length of the range. Similar views are likely to exist from SH72 west of Glenroy.

At the Rakaia Gorge on SH72, Steepface Hill frames the view up the Rakaia valley to Peak Hill/Mt Oakden Ranges and the distant Southern Alps.

Steepface Hill is the focus of views travelling southwest on the Lyndon Road, forming a dramatic skyline backdrop. The Rakaia faces tower over the Blackford-Double Hill Road, imparting a sense of great height, steepness and ruggedness. There are close views of the spectacular areas of bedrock erosion. Jack Stream valley is a natural

visual focus of a view southeast from the road as it rounds Black Hill. Its shallow sweeping lower basin with sharply truncated edges is visually distinctive.

## 2.2 Landforms and Geology

The underlying rock on Redcliffe is greywacke and argillite with minor associations of conglomerate and metavolcanics. Pleistocene outwash gravels infill the basins and mantle mountain slopes.

The major landform groups on the property are:

- planar, very steep, glacially scoured mountain slopes up to 1200 m in altitude, at the northern end of the Mt Hutt Range
- moderately steep mountain slopes of the remainder of the Mt Hutt Range, with extensive areas of sheet scree above 1500m, scattered rock outcrops and occasional cirque basins containing rockfall scree and occasional, moraines and rock glaciers
- The lower catchment of Jacks Stream, part a 800m wide, gently sloping basin floor of fluvio-glacial gravels capped by loess and large alluvial fans (“Redcliffe basin”).
- Recent floodplain terraces of the Rakaia River

## 2.3 Climate

According to Catchment Board records the rainfall at the homestead is around 750mm, and at Cookies Point around 1400mm. The prevailing wind is west to north-west. These funnel down the Rakaia Valley, particularly in spring and autumn and sometimes bring rain. Rain is more reliable from the south, however. Snowfalls are frequent from May to August. On the higher mountain slopes and basins snow lies for about four months. On the flats and low hills, heavy snowfalls may lie for some weeks but generally snow melts on sunny aspects in a few days.

## 2.4 Vegetation

### 2.4.1 Vegetation types

#### Lowland Environment (< 500m)

The river flats, fans, terraces and lower colluvial hillslopes on the Rakaia River faces are the only part of Redcliffe Station which occupies a lowland environment. Communities in this zone include weedy riverbed and shrubland vegetation, a prostrate kowhai shrubland, and exotic grasslands.

#### *“Weedy” riverbed and shrubland vegetation*

A community dominated by exotic species occupies disturbed riverbeds, fans and terrace risers. Species include sweet briar (*Rosa rubiginosa*), broom (*Cystisus scoparius*), gorse (*Ulex europea*), lupins, exotic grasses and herbs. Shrublands of



matagouri (*Discaria toumatou*), kowhai (*Sophora microphylla*), and mingimingi (*Coprosma propinqua*) are also common, on lower altitude slopes with bracken (*Pteridium esculentum*) forming an understorey. Associated with the shrublands are patches of open grassland which have a high exotic component. This community is especially prevalent between Terrible and Hutt streams.

#### *Prostrate kowhai shrubland*

On the terrace face of the old alluvial fan at the mouth of Hutt Stream is a prostrate kowhai shrubland. *Sophora prostrata* occurs in association with matagouri, mingimingi, porcupine shrub (*Melicytus alpinus*), kowhai (*Sophora microphylla*), briar, exotic sweet vernal (*Anthoxanthum odoratum*), mouse-eared hawkweed (*Hieracium pilosella*), thistle and woolly mullein (*Verbascum thapsus*). This area was identified as an RAP in the Mt Hutt PNA Survey.

### **Montane Environment (500 - 1000m)**

#### *Forest remnants*

Forest remnants on Redcliffe Station are most common south of Cookies Point, in the Swift and left branch of Ashburton Rivers, and Waterfall Creek. Other remnants occur in Hutt Stream; Redcliffe Stream; Snowy Stream; McLennan Stream, as well as many of the minor tributary gullies feeding into the Rakaia, Swift and Left Branch of Ashburton Rivers.

They are commonly found in shaded rocky gullies, but also on colluvial mountain slopes which have exposed rock and screes. Their rocky location is likely to have protected them from the impacts of fire and grazing animals.

The main types of forest remnant present are:

- Mountain beech (*Nothofagus solandri* var. *cliffortioides*) forest pockets with a comparatively open canopy. Species commonly associated with the beech forest include kohuhu (*Pittosporum tenuifolium*), broadleaf (*Griselinia littoralis*), *Hebe traversii*, *Coprosma linariifolia*, *Corokia cotoneaster*, mountain wineberry (*Aristotelia fruticosa*), porcupine shrub, *Coprosma rigida*, and mingimingi. Halls totara (*Podocarpus hallii*) may or may not be present. This community is most common in the Ashburton and Waterfall catchments. Smaller remnants are found elsewhere (e.g. Rakaia face gullies).
- Mixed species of hardwood forest dominated by broadleaf, mountain ribbonwood (*Hoheria lyallii*), mountain five finger (*Pseudopanax colensoi*), lancewood (*P. crassifolius*), lemonwood (*Pittosporum tenuifolium*), and golden akeake (*Olearia paniculata*). It has a rich understorey of the above species together with flax (*Phormium cookianum*), prickly shield fern (*Polystichum vestitum*), *Corokia cotoneaster* and some tussock hawkweed (*Hieracium lepidulum*) present. This community occurs in the Ashburton and Waterfall catchments, as well as in the Snowy Stream catchment. In Redcliffe Stream and Hutt Stream, it forms patches between unvegetated eroding outwash gullies which have protected them from

fire. Here, kowhai and cabbage trees (*Cordyline australis*) are also present. The understorey of the former is more modified with briar and exotic grassland species present, and is found in association with matagouri/fescue tussock grassland which have been maintained through burning and grazing.

- Halls Totara-mixed broadleaved forest is found in rocky areas with colluvial material. This forest type is found in the Ashburton, Waterfall Creek and Snowy Stream catchments. It is associated with *Olearia avicenniifolia*, mingimingi, mountain wineberry, and grades into scrub with kanuka (*Kunzea ericoides*), mountain ribbonwood, *Hebe traversii*, *Olearia paniculata*, mountain five finger and matagouri. Mountain toatoa (*Phyllocladus alpinus*) is sometimes present (e.g. Snowy Stream catchment).

#### *Montane Shrublands*

On young soils of terraces and fans, matagouri, mingimingi, and mountain wineberry form a shrubland, with bracken and *Corokia cotoneaster* sometimes present. Other species present may include mountain ribbonwood (*Hoheria lyallii*), *Olearia paniculata*, mountain beech, kowhai, broadleaf, cabbage tree (*Cordyline australis*) and kanuka, with vines of *Clematis marata*, native jasmine (*Parsonsia capsularis* var. *tenuis*) and *Muehlenbeckia australis*. This shrubland is common in the Hutt Stream catchment, and in gullies on the Rakaia Faces, Rat Hill, Mt Hecla massif, Waterfall and Ashburton River catchments where it is often associated with forest remnants. It is derived from the mixed hardwood forest community.

Areas more recently disturbed have less species diversity, being dominated by matagouri, mingimingi, mountain wineberry, and presence of *Olearia bullata*. The ground cover is largely exotic grasses.

#### *Modified copper tussock grasslands*

Copper tussock grassland (*Chionochloa rubra* var. *cuprea*) occupies a gently sloping shoulder slope above Redcliffe Stream on either side of Jack Stream, and has been modified through AOSTD, stock grazing and trampling. Yorkshire fog, sweet vernal and jointed rush (*Juncus articulatus*) are the more important intertussock species.

#### *Developed short tussock grasslands*

Developed short tussock grasslands are most prevalent on the Rakaia faces, but also occur adjacent to Jacks Stream in the lower Redcliffe Stream. They occur on stable fan surfaces, terraces and sunny north facing hillslopes, to about 1000m. They are characterised by mainly exotic species which include sweet vernal, brown top, Yorkshire Fog, white clover, Kentucky blue grass (*Poa pratensis*), chewing fescue (*Festuca rubra*), cocksfoot (*Dactylic glomerata*), with scattered silver tussock, fescue tussock, cabbage trees and matagouri bushes. Mouse-eared hawkweed is most common in areas where sheep camp. Tussock cover increases with altitude. Matagouri, bracken and tutu (*Coriaria sarmentosa*) are most prevalent on the faces between Hutt Stream and Little River.

### *Induced short tussock grasslands*

Fescue tussock grasslands are widespread throughout the property on old forest soils, on steep colluvial mountain slopes between about 800m and 1100m. They have been induced by periodic fires and maintained by grazing. Fescue tussock is closely associated with mountain cotton daisy (*Celmisia spectabilis*). Typically, there is much bare ground or rock present. The open nature of the grassland encourages high diversity, especially of low growing herbaceous species such as *Leucopogon fraseri*, *L. colensoi*, *Pimelia pseudo-lyallii*, *P. prostrata*, *Raoulia subsericea*, *Celmisia gracilentia*, and the orchids *Microtis unifolia* and *Thelymitra longifolia*.

These grasslands are largely comprised of native species except where sheep camp (e.g. N facing slopes of McLennan creek). The most common exotic species present is hawkweed. Mouse-eared hawkweed cover varies considerably along the Swift catchment. On many north and west facing slopes and fans it's cover ranges from 6 to 65% cover, whilst it has a 1% cover on Mt Hecla. Hawkweed presence declines with altitude.

Individual tall tussocks (*Chionochloa flavescens*; *C. macra*; and *C. rubra* var. *cuprea* in moister sites) may be scattered through this grassland. Montane matagouri shrubland is also closely associated with this grassland.

### *Broad leaved snow tussock (Montane and subalpine environments)*

Broad leaved snow tussock (*Chionochloa flavescens* "robust") occurs on the steep rocky hill slopes. On the sunny faces, individual tussocks occur within the short tussock community. However, more dense stands (15 - 25% cover) do occur on broken mountain slopes in the Swift catchment (e.g. Mt Hecla, Rat Hill, Steep Face Hill) especially above 1200m. The community is dominated largely by native species, with associates of blue tussock (*Poa colensoi*), mountain cotton daisy, *Pimelia oreophila*, *Pentachondra pumila*, fescue tussock, and harebell (*Wahlenbergia albomarginata*). Mouse-eared and tussock hawkweeds may also be present.

In the Hutt Stream catchment, broad-leaved snow tussock extends from 800m to 1400m. At 850m, tussock cover is about 50%. Whilst the ground is still broken, litter forms a thick mat. Intertussock species diversity is surprisingly high considering the litter cover and includes mountain flax, the speargrass *Aciphylla colensoi*, golden spaniard (*Aciphylla aurea*), mountain cotton daisy, *Anisotome filifolia*, *Pterostylis australis* orchids, and short tussock species. Hawkweed presence is low on shady faces (1%), and variable on sunny faces (up to 30%), where matagouri shrubs are also more common. At it's upper limit, this community occurs on the more stable slopes (surrounded by active screes), and tends to have a more open canopy. Where moist flushes occur *Celmisia glandulosa* is present.

### *Montane Rocklands*

Many of the streams on Redcliffe Station are characterised by bluffs and gorges. Where moist, these bluffs are characterised by *Astelia nervosa*, *Hebe traversii*, flax,

*Gingidia montana*, *Helichrysum bellidioides*, *Celmisia bellidioides*, *Parahebe lyallii*, *Dolichoglottis scorzonerooides*, tutu, and *Hebe pinguifolia*. Elsewhere, *Helichrysum intermedium*, *Rytidosperma setifolia*, *Asplenium trichomanes*, *Hebe pinguifolia*, *H. traversii*, and flax are common.

#### *Montane Riverbeds*

Riverbed vegetation is variable. On gravelly semi-stable material, in the Swift and Snowy Stream catchments, mat forming vegetation such as *Raoulia tenuicaulis*, *Raoulia* "bronze", are found, together with native willowherbs (*Epilobium melanocaulon*, *E. brunnescens*, *E. pycnostachyam*), *Geranium sessiliflorum*, *Wahlenbergia albomarginata*, bidibids (*Aceana inermis*), *Parahebe Lyallii*, *Colobanthus strictus*, fuzz weed (*Vittadinia australis*), *Muehlenbeckia axillaris*, fescue tussock and *Helichrysum depressum*. The exotic component is variable, with sweet vernal, stonecrop (*Sedum acre*), white clover, sheeps sorrel (*Rumex acetosella*), and the occasional gorse or broom bush.

#### **Subalpine Environment (> 1000m)**

##### *Slim-leaved snow tussock*

In the Swift catchment slim-leaved snow tussock (*Chionochloa macra*) occurs naturally in the subalpine zone to about 1450m, but also extends down to 900m, where it is found as scattered individuals amongst the fescue tussock grasslands.

This grassland occurs on colluvial hill slopes, summits and basins. Tussock density and quality increase with altitude. Common species include mountain cotton daisy, *Raoulia subsericea*, and *Leucopogon fraseri*, with *Oreobolus pectinatus* and *Gentiana corymbifera* occurring in damp flat sites. At Waterfall Creek, *Celmisia walkerii*, the mat speargrass *Aciphylla monroi*, the buttercup *Ranunculus monroi*, *Anisotome imbricata* var. *prostrata*, bristle tussock (*Rytidosperma setifolia*), *Uncinia* sp, *Pimelia prostrata*, and *Kelleria dieffenbachii* are also present. More woody species occur on shady faces, including *Hebe lycopodioides* and *Dracophyllum uniflorum*.

This community was not observed in the Hutt Stream catchment.

##### *Subalpine Scrub*

*Dracophyllum* shrubland occurs on colluvial, often shady, hillslopes, in association with broad leaved snow tussock grasslands. Species include *Dracophyllum longifolium*, *D. longifolium x uniflorum* hybrid, *D. uniflorum*, *D. pronum*, *Cassinia leptophylla*, *Pimelia oreophila*, with broad leaved snow tussock, fescue tussock, mountain cotton daisy, and blue tussock.

##### *Screefields*

Screes extend from 1816m to about 700m. They occupy very steep mountain slopes, and have low vegetation cover (~1%). Species include penwiper (*Nothothlaspi*

*rosulatum*, native willowherb (*Epilobium pycnostachyum*), *Cardamine bilobata*, *Hebe epacridea*, *Poa buchananii*, *Agrostis magellanica* and *Haastia sinclairii*. In addition, the PNA survey recorded species such as *Leptinella dendyii*, *L. atrata*, *Stellaria roughii* and *Ranunculus haastii* in gravelfields of the Mt Hutt Ecological District.

### *Fellfields*

Fellfield communities occur on gentle, more stable summit ridges where rocky open areas exist. They are characterised by cushion or mat forming plants such as *Chionohebe pulvinaris*, *Dracophyllum pronum*, *Luzula pumila*, *Kelleria dieffenbachii*, *Myosotis pygmaea*, *Raoulia youngii*, *Epilobium atriplicifolium*, and *Hebe tetrasticha*.

### *Alpine Rocklands*

Where rocky outcrops are present on ridges and edges of screes, a range of alpine species occur. Vegetable sheep (*Raoulia eximia*) form prominent cushions on the rocks, whilst *Aciphylla montana* var *gracilis*, *A. monroi*, *Koeleria novae zelandiae*, *Poa cockayneana*, *Epilobium crassum*, *Myosotis australis*, *Leptinella pectinata* subsp. *willcoxii*, *Schizeilema hydrocotyloides*, *Helichrysum intermedium*, *Colobanthus acicularis*, and *Ranunculus "monroi"* occur in rock crevices.

## **Assessment of Significance**

### *Rakaia Faces*

Much of the lower hillslopes of the Rakaia Faces have been modified through historic burning, oversowing, topdressing, and grazing, whilst the lowland river flats and fans have a high exotic component. These areas therefore have little botanical value.

Stock grazing and trampling of the copper tussock grassland near Jacks Stream has reduced its conservation value.

The beech forest remnants, and regenerating mixed broadleaved forest patches that occupy many of the gullies including Redcliffe Stream (adjacent to RAP 15 on the true left of the Stream), Terrible Gully, and those between Little River and Hutt Stream are of interest for nature conservation, as there are few examples of the original forest cover at this end of the Rakaia valley.

Also of significance is the small area of prostrate kowhai shrubland (RAP 7) found on the steep terrace riser adjacent to Hutt Stream. The area contains two species of interest - prostrate kowhai (*Sophora prostrata*) and a small creeping plant *Einadea allanii* growing under the kowhai, neither of which have been recorded elsewhere in the Heron Ecological Region (Arand and Glenny 1990). Both species are uncommon in inland Canterbury. Sweet briar, exotic grasses and clover are also present within this shrubland.

The vegetation at higher altitudes on the Rakaia Faces are a mosaic of snow tussock grasslands, scree and rockland vegetation. They have a high native species component, and are natural.

*Rat Hill and Upper Swift River/Snowy Stream catchment*

Rat Hill has a diverse range of communities relating to both altitudinal and aspect gradients. Communities include subalpine scree, fellfield, rockland, slim and broad leaved snow tussock and shrubland; and montane broad and slim-leaved tussock grasslands, fescue tussock-mountain cotton daisy tussock grasslands, shrubland and remnant forest.

The area includes a range of habitats and physical features including steep colluvial mountain slopes, screes, gentle summit slopes, gorges and mountain streams, Many of the communities show a high degree of naturalness with few exotic species present.

The slim leaved snow tussock communities found in this area, especially on the Rat Hill summit slopes, at Rat Saddle, and below Steep Face Hill (part of an RAP), are the best observed on the property, being in excellent condition in terms of dense canopy, and native intertussock species presence.

The montane short tussock grassland and slim-leaved snow tussock communities at their lower altitudinal limit, show the highest level of modification of all the communities present here. This area has not been oversown, so species composition is largely native. Three hawkweed species however are present, with mouse-eared hawkweed cover locally reaching 65% (average 25%). This community is likely to succeed to a montane shrubland community if grazing pressure is reduced, as there is a ready seed source present.

There are some good examples of mixed broadleaved forest remnants and associated shrublands in the gorged section of Snowy Stream/Swift River with a diverse range of species present.

*Mt Hecla massif*

This area ranges from 700m to 1734m, and contains a moderately wide range of communities and ecosystems similar to those found on Rat Hill. Whilst the unit lacks the variety in aspect, with the majority of country facing north or northwest, other aspects are represented on the adjoining retired country.

Natural diversity is good, with a range of natural and semi natural communities occurring in a montane to almost alpine environment. The condition of scree and rockland communities is excellent, with good species diversity. The broad leaved snow tussock grassland, however, tend to be rather open, with moderate to poor intertussock species diversity.

These hillslopes have not been oversown for pastoral development so few exotic species are present, except where sheep camp at lower altitudes. Hawkweed cover is

very low (1 %), even in the short tussock grassland communities. Elsewhere on the property, hawkweed is usually common in this community

Shrublands derived from broadleaved forest occupy many of the gullies, especially between Cookies Point and McLennan Stream. Whilst exotic grasses may contribute to the ground cover, exotic shrubs e.g. briar, gorse, and broom, are a minor component.

#### *McLennan Stream to Waterfall Creek (Ashburton River)*

This area contains a wide range of vegetation communities which is a reflection of its diverse topography. The unit rises from 620m to 1390m, and comprises gullies, gorges, steep colluvial mountain slopes, screes, gentle subalpine basins and ridgetops, and mountain streams.

Whilst the plant communities include subalpine screes, rockland, slim snow tussock, shrublands; montane short tussock grasslands, broad leaved snow tussock grasslands, copper tussock, and shrublands, the high presence of forest remnants makes this unit stand out from the rest. There are both mountain beech forest, mixed broadleaved forest, and totara forest remnants which occupy the deeply dissected gully and gorge topography associated with the Waterfall Creek, Ashburton River and its tributaries. Several of the remnants were identified as an RAP in the PNA survey. The dissected and rocky nature of this country, together with the river gorges have protected the vegetation communities from fire and grazing animals and have contributed to the high diversity of plant species and the presence of forest within this unit.

The subalpine communities show a high degree of naturalness with a very low incidence of exotic species.

The montane short tussock grasslands are largely native, with hawkweed being the predominant exotic species present. Hawkweed cover decreases with increasing altitude. However, closely associated with this community are the montane shrublands and forest remnants, which provide a seed source to facilitate succession towards a more stable woody community.

Further diversity is provided by the bluffs and gorges in the Ashburton River, below Cookies Point. The rock faces support a range of largely native species.

#### *Hutt Stream Catchment*

Hutt Stream catchment has a high diversity of habitats and communities, and exhibits an altitudinal sequence from 1876m (Steep Face Hill peak) to 600m. It is the only sub catchment of the Rakaia valley on the property to have both strong altitudinal and aspect gradients reflected in the vegetation.

Communities include remnant broad leaved forest, montane shrublands, broad leaved snow tussock grassland, scree, rockland, fellfield, and riverbed. The range of landforms present include steep colluvial mountain slopes, very steep gullies, gentle shoulder slopes, rocky bluffs, screes, gullies and gravelly riverbeds.

The forest is around 3-4 ha in extent and is on the lower valley sides extending upslope from the creek for approximately 100m and principally on the true left bank. The canopy is predominantly lemonwood (*Pittosporum tenuifolium*), kowhai and broadleaf while the understorey is mainly korokia (*Corokia cotoneaster*), and small leaved Coprosmas. Stock have been through the forest but the interior is only moderately tracked.

The broad leaved snow tussock grasslands found in this catchment are of note, being of excellent condition, density and stature. Intertussock species diversity is surprisingly high considering the amount of litter which has formed around the tussocks and includes mountain flax (*Phormium cookianum*), spaniard (*Aciphylla Scott-thomsonii*), cotton daisy and a number of other small herbs.

The subalpine communities are largely natural, whilst the grasslands associated with montane shrublands and forest remnants at lower altitudes tend to have an exotic component of sweet vernal, Yorkshire fog and white clover. The cabbage trees present at 770m may be at the highest altitude recorded in the Ecological District.

## **2.4 Fauna**

No specific faunal survey was carried out for tenure review but birds recorded during the vegetation field work include the threatened falcon, Australasian harrier, pipit and kea around mountain tops and Redcliffe Saddle. Paradise shelducks were around the tarn near Redcliffe saddle and in the Ashburton River bed along with South Island pied oyster catchers. Black-backed gulls were nesting near the confluence of the Swift and Ashburton Rivers. In the forest remnants and surrounding shrublands there were grey warbler, bellbirds and silver-eye. Self-introduced or naturalised birds included spur winged plover, yellow hammer, skylark, chaffinch, blackbirds and magpies.

### **2.4.2 Fisheries**

No fisheries data is available from recent survey work. However, the native fish community is likely to resemble that of the adjacent pastoral leases Glenarriffe and Double Hill. Upland bully, common river galaxias and alpine galaxias are therefore likely to be present. In the small streams to the northern end of the lease (i.e. Donald Stream, Packers Stream and Redcliffe Stream) which enter the Rakaia River there may be some limited penetration by salmonids for spawning but this is not likely to be significant.

## **2.6 Historic values**

Up until the late 1980's Redcliffe was part of Glenrock. Glenrock has now been subdivided into two separate units - Redcliffe and Glenrock. For a period prior to 1938 Glenrock was part of Double Hill. About 1940 Double Hill was split into three units - Glenrock, Glenarriffe and a smaller Double Hill. In 1953 19,000 ha was added to the original Glenrock run from "SteePhill", part of the Blackford Run. Since then



1150 ha was included into Mt Alford. There are no known areas of historic interest on the property.

## **2.7 Public recreation**

### **2.7.1 Access**

Section 24, marginal strips were surveyed out either side of Redcliffe Stream and the Swift River at the time of the subdivision of Glenrock in 1988 providing access to the head of the Redcliffe Stream. The two strips are not connected, however, and do not join onto any other formed access. A legal road runs from the Double Hill Road near the Redcliffe homestead to the Swift River, but does not follow any formed access. At the time of lease renewal the Commissioner of Crown Lands recommended that pedestrian access be negotiated to the Swift River along the formed 4 w.d. track. At the time of surrender negotiations in 1991 this was not, however, agreed to. Instead access was negotiated from Redcliffe Stream to the retirement area on Redcliffe via a ridge between Rat Hill Stream and Jacks Stream, and on Glenrock from the Double Hill Road to Black Hill following a fenceline then ridgeline. The completion of legalising this access and surrender is still awaiting cadastral survey.

### **2.8.2 Recreation activities**

Very little is known about the recreation use of Redcliffe. The main current use is angler access to the Rakaia River - across freehold, and a small area of flats on pastoral lease just north of Hutt Stream. There are possibilities for tramping trips in the Mt Hutt Range from Hutt Stream, and for access down the Swift to the Ashburton River. From the junction of the Swift and Ashburton Rivers there are two main alternatives - to carry on down the Ashburton to Mt Alford if the river is very low or to travel back up the North Branch Ashburton River to Glenarriffe. The Mt Hutt Range is sometimes used for heliskiing and has some potential for climbing and ski-touring.

Mountain biking and horse trekking are possibilities along the Swift catchment from Rakaia.

## **PART 3 - CONSULTATION AND OTHER PLANS**

### **3.1 Consultation**

On 11 December 1997 a meeting was held with representatives from Forest and Bird, Four-Wheel Drive Club, Federated Mountain Clubs, N Z Landscape Architects Institute to discuss tenure review on Redcliffe amongst other properties.

Areas of interest include protection of snow tussocklands, the Ashburton Gorge, and provision of public access to the Swift River across Redcliffe Saddle, as the route down the Ashburton River is noted as a recognised tramping trip. There was a concern that topdressing of the slopes above the tarn near Redcliffe Saddle could affect water quality. Four-wheel drive access was requested through the property.

### **3.2 District Plan provisions**

Redcliffe lies within the Ashburton District. Their proposed District Plan was notified in March 1995.

Under this Plan Redcliffe is zoned Rural C (High Country). The plan identifies two areas on the property that are sites of significant natural conservation value - Area 9 Hutt Stream Fan (Mt Hutt RAP 7) and Area 10 Steepface Hill (Mt Hutt RAP 21).

For areas of significant conservation value, riparian<sup>1</sup> and alpine environments (areas above 900m) the District Plan has a number of rules:

- No earthworks to exceed 20 metres<sup>3</sup> in volume and/or 50 metres<sup>2</sup> in area in any one hectare in any continuous period of five years or to be located on slopes greater than 20 degrees.
- No clearance of indigenous vegetation in the Rural C zone to exceed 100m<sup>2</sup> in area in any one hectare in any continuous period of five years, except for amenity plantings.
- No exotic tree planting, except amenity tree plantings (and in the case of riparian management areas - no exotic tree planting intended for commercial purposes)
- No buildings to be erected.

This means that the above activities require consent as a discretionary activity.

For general landscape values, except for what is provided in the rules above, all buildings, tree planting (other than of amenity trees), and earthworks (other than the repair and maintenance of operational tracks) in Rural C and located on slopes with an angle of greater than 20°, shall be Controlled Activities in respect on siting, design and methods of construction.

For general natural conservation values, except for what is provided in the rules above, there should be no clearance of indigenous vegetation, other than matagouri, which has an average maximum height of the canopy of greater than three metres, exceeding 1000 m<sup>2</sup> in any area in any continuous period of five years.

“RELEASED UNDER THE OFFICIAL INFORMATION ACT”

## **PART 4 FOR OFFICIAL USE ONLY RECOMMENDATIONS AND JUSTIFICATION**

### **4.1 RECOMMENDATIONS**

That the proposals described below be submitted to the CCL’s Agent, during the consultation process on the preliminary proposal for this tenure review, as representing the views developed under delegated authority from the Director-General of Conservation.

- 4.1.2** Note that statutory consents will be required before the CCL can include the following proposals in the preliminary proposal for this tenure review:

### **4.2 AREAS TO BE RESTORED TO OR RETAINED IN FULL CROWN OWNERSHIP AND CONTROL**

#### **4.2.1 Waterfall Creek/North Branch Ashburton River/Swift River catchment (“1” on attached map)**

*Authority:*

*Proposal:* It is recommended that an area of approximately 2500 ha in the middle and southern parts of the lease be retained by the Crown and administered by the Department of Conservation as a Conservation Area.

*Summary description:* This recommended area covers all that area of the lease on the true left of the North Branch Ashburton and Swift Rivers (including the Hecla massif), the headwater catchment of the Swift River and the west facing slopes of Rat Hill.

*Justification*

- This area has a high diversity of habitats and communities with altitudinal and aspect derived vegetation patterns.
- The forest patches and associated shrublands which are remnant in the rocky gullies and the Ashburton River gorge are in especially good condition. These are valuable representatives of the forests that were originally much more extensive in the district. These ones are the most inland of the mixed-species hardwood forest in the ecological district.
- The subalpine communities have a high degree of naturalness, requiring minimal active management to maintain their values.
- Of special note are the slim leaved snow tussock grasslands which are in excellent condition in this area.
- The other special features of this area are the dense broad leaved snow tussock grasslands on shady faces associated with *Dracophyllum* shrublands; the gorge

rockland vegetation and the totara-mixed broadleaf forest remnants with mountain toatoa.

- This area has a highly natural landscape character. Obvious cultural modifications are absent. Snow tussock communities on the crest and east facing aspects of Rat Hill are very dense in places, and are visually continuous with the extensive dense snow tussock on the retired south-facing slopes of Steepface Hill.
- The Ashburton Gorge is an area of dramatic, highly natural river gorge country. The Ashburton River and associated gorge provides a richly varied visual and recreational experience over several kilometers. Gorge experiences of this scale are not common in the Hutt district where most valleys have a more open character dominated by tussockland and grey scrub.
- The diverse shrubland in the Swift River gorge, are of smaller more intimate scale than the Ashburton Gorge but provide an equally rich visual and recreational experience with its very winding, narrow, enclosed rocky course, pools and rapids, a natural rock arch, and varied colours and textures of the native vegetation.
- The gorge is an important foot access route down the Ashburton River when the river is low, and is sometimes used for rafting.
- The long term viability of the area is good as adjoining land in other parts of the Waterfall Creek catchment, North Branch Ashburton River, Steep Face Hill and the Mt Hutt Range are already protected or are no longer grazed (as Conservation Area or retired Crown Land). The Ashburton River is very gorgy and steep, further facilitating the protection of the forest remnants from fire and animals.
- Inclusion of the lower true right of Waterfall Creek will mean protection of the whole Waterfall Creek catchment and inclusion of Rat Hill and the Swift River gorge would achieve protection of the whole upper Swift catchment. It would also be a logical addition to the existing protected areas of the much larger forested Pudding Hill Stream valley (Mt Hutt Forest), and the retired portions of the lease to the north (McLennan Creek and Snowy Stream valleys, and Swift River headwaters). Protection of a large compact area with a diverse range of native vegetation communities centred around the Mt Hutt range would result.

*Boundary and management issues:* Although the low to mid-altitude slopes of the Hecla massif and parts of Rat Hill is depleted tussockland with hieracium, it still retains a highly natural appearance and a diversity of native plant communities typical of the district (scree and rock plants, snow and short tussock, matagouri and "grey" shrublands, mixed shrublands, manuka, dracophyllum, ribbonwood groves, red tussock wetlands). The natural diversity of species is good, with a range of natural and semi-natural communities occurring with few exotic species. The condition of scree and rockland communities is excellent with good species diversity.

The main threats to ecological and natural landscape values are continued stock grazing and fire which slow down or prevent regeneration of native vegetation or

further its loss. Invasion of exotic weed species from upstream sources may also be a significant threat (gorse exists in the Swift and in the upper Ashburton valley). Any kind of human modification within the catchment such as fencing or tracking would be likely to detract from its natural landscape qualities. Deer, possums and pigs are also threats.

Whilst the montane grassland communities (below about 1000m) are a product of historic burning of forest and subsequent burning and grazing associated with pastoral use, they are largely native in composition. Hawkweed is the only common exotic, especially in the mid-upper Snowy Stream hillslopes of the Back Block and in the mid-slopes of Mt Hecla. It appears to spread into this community type irrespective of management. However, since this community is associated with the shrubland and forest remnants, it is likely to succeed to a more stable community with a significant woody species component. Sweet vernal, and occasional broom bushes are also present in the river flats.

This area would need to be fenced off from stock if regeneration is to be promoted. A practical fence line needs to be investigated but would optimally be located along the boundary identified on Rat Hill and the saddle between Rat Hill and Steep face hill. Any fenceline needs to be carefully located and constructed so it does not impact on landscape values. Effective deer, pig and possum control may also be required. Weeds such as gorse, broom and willow may need to be regularly checked in the gorge and removed.

#### **4.2.2 Hutt Stream Catchment and upper Rakaia faces (Area “2”)**

*Authority:* s. 35 (2)(8) CPLA

*Proposal:* It is recommended that an area of approximately 900 ha in the Hutt Stream catchment and high altitude faces of the Rakaia River be retained in Crown ownership and administered by the Department of Conservation.

*Summary description:* This area includes the Hutt Stream catchment above the fenceline and the mid to upper slopes of the northern end of the Mt Hutt range facing the Rakaia valley.

##### *Justification*

- The Hutt Stream catchment has high diversity of habitats and communities, ranging from montane to subalpine environments with altitudinal and aspect derived vegetation gradients.
- The subalpine plant communities of the Rakaia faces, have a high degree of naturalness with only some exotic pasture species occurring at mid altitudes.
- Of special note is the high quality broad leaved snow tussock grasslands present.
- The Rakaia faces have a highly natural character, dominated by clearly defined, dramatic glaciated landforms of huge scale, emphasized by their predominantly

tussock grassland cover. The areas of rock bluff, exposed bedrock and scree are particularly impressive in this area.

- The Rakaia faces are a highly visible and significant part of the outstanding upper Rakaia valley landscape. The Mt Hutt range, of which the Rakaia faces are a part, comprises one of three broadly distinctive mountain "blocks" enclosing the south side of the upper Rakaia valley, providing a dramatic skyline backdrop to the world-class braided Rakaia river (the other two being the Black Hill and Palmer Ranges).

The Mt Hutt range is the most frequently visible "block". It dominates views across the Rakaia from the Coleridge, Homestead and Lyndon Roads, forming a spectacular skyline backdrop viewed at close range and in full detail.

Steepface Hill in particular forms a consistently dramatic backdrop towering over the Rakaia viewed from the Lyndon and Homestead Roads. These roads are part of an important route connecting SH73 to Arthurs Pass and the West Coast with SH72 to mid and south Canterbury, and providing a unique, easily accessible "backroad" experience in the mid-Canterbury area.

The Mt Hutt range also forms a spectacular backdrop to the Plains in the Rakaia Gorge area. Here the contrast between the highly developed plains and terraces and the relatively highly natural, extremely steep and sheer, high mountainsides so characteristic of mid-Canterbury is at its most dramatic. The range dominates the view travelling southwest along the Hororata-Windwhistle road, a well-used route from Christchurch to the Rakaia Gorge, the general Rakaia-Coleridge area (popular for recreation), Mt Hutt ski-field and SH72. The Hutt Stream and Little River catchments, within Redcliffe pastoral lease, are important parts of this backdrop comprising its western end.

- Jack Stream valley with its elevated broad, shallow basin is a distinctive natural visual feature viewed from the Double Hill Run Road.
- The Hutt Stream catchment provides a number of recreation opportunities including tramping and ski-touring, as well as access into the centre of the Mt Hutt Range.

*Management and boundary issues:* The main threats to landscape values of these highly visible and sensitive mountain slopes are visual scarring through tracking and bulldozed fencelines, and forestry. For the natural values further degradation of the tussocklands will result if stock grazing continues or if burning occurs. Remaining shrublands would also be further reduced by fire.

It is recommended that the majority of the Hutt Stream catchment and these upper mountain slopes be permanently retired from grazing. According to the run plan these upper slopes were supposed to be retired and surrendered. However, this line was never fenced and from memory the ridge of the Mt Hutt Range was chosen as the boundary line as this was a definable line for survey. Fencing of the natural values at an altitude of approximately 1200m does not look to be practical, in which

case the trespass by stock may have to be accepted on the upper Rakaia faces. The current fence at the entrance to Hutt Stream would probably prevent stock gaining access to Hutt Stream, unless they graze over the top (above the fence) from Terrible Gully. Using this fence means some loss of grazing in the lower Hutt Stream, but means less overall fencing. The alternative is to fence ridges and valleys at an altitude that is dictated by practical lines which would basically mean fencing off the lower AOSTD slopes. This line is estimated to be where the recommendations line is drawn (compared with the values line).

Burning is another concern with the maintenance of the nature conservation values. Future burning of these lower slopes (eg, to clear regenerating scrub) is risky due to potential for uncontrolled upslope spread of fire. Burning should therefore be avoided or only undertaken with the utmost care in conditions least favourable to upslope spread and should not be undertaken in the Hutt Stream catchment. Some briar and broom bushes are present in the Hutt Stream which would require controlling.

The Hutt Stream catchment stands to be viable in the long term, as it comprises a whole catchment backing onto a retired area, thereby embracing the concept of biological corridors to protect ecological processes

## **4.3 COVENANT DESIGNATIONS**

### **4.3.1 Prostrate kowhai shrubland (“3” on attached map)**

*Type of covenant:* Reserves Act

*Summary Description:* A small (3 ha), but dense stand of prostrate kowhai on the a terrace riser near the mouth of Hutt Stream.

*Justification:* The prostrate kowhai shrubland community found on the Hutt Stream fan has two notable plants present - *Sophora prostrata* and *Einadia allanii*. Both of these are uncommon in inland Canterbury. The area was identified as an RAP by the PNA survey.

*Management and boundary issues:* Briar is present and would require controlling. Sheep grazing is likely to benefit the shrubland by keeping the exotic grass species down.

## **2. Shrublands in Redcliffe Stream (“4” on attached map)**

*Authority:* s. 40 (1)(c) CPLA

*Type of covenant:* Reserves Act

*Summary description:* The side slopes from boundary to slope crest or fenceline in the lower part of Redcliffe Stream down to the road bridge and including most of the incised shrubby gully of Jack Stream.



*Justification:* Whilst open to stock grazing and lacking the density of cover existing on the true left side (on Glenrock), there remains a diversity of native shrub species and kowhai groves on Redcliffe, especially where protected by steep rocky terrain. These are considered worthy of protection. They also represent the sunny west facing aspect of the valley system. In the absence of grazing and repeated fire, they are likely to revert to dense riparian shrubland and forest.

*Management and boundary issues:* The main threats to natural landscape values are fire and grazing both of which cause loss of vegetation and prevent regeneration.

The aims of the covenant would be to protect and promote regeneration of the existing shrubland cover. Ideally the area would be fenced off permanently from stock grazing. Further burning and clearance (including spraying) of shrubland would be unacceptable.

#### **4.4 PUBLIC ACCESS DESIGNATIONS**

Several important public access routes to both proposed conservation areas and existing retired land require negotiation on Redcliffe Station. These can be protected by access easements and are recommended:

1. From Double Hill Run Road to Hutt Stream catchment reserve This would ensure that the public could gain access to the retired country of Mt Hutt Range
2. From Redcliffe Stream paper road to the Rat Hill reserve
3. From Swift River, up McLennan Stream to the retired country