

## **Conservation resources of Double Hill Pastoral Lease, Canterbury**

Department of Conservation, Canterbury Conservancy, Pastoral Lease survey series report  
to Eagle Trust Limited

27 May, 1997

### **PART 1 - INTRODUCTION**

#### **1.1 Double Hill**

Double Hill consists of 7,000 ha of pastoral lease that stretches in a westerly line from the Rakaihi River to the north, east around through Tuiwai Stream and the upper catchment of the North Forks Ashburton River, south into the Peat River and the northwestern side of the Horro Stream, and west into the Selkirk River. In the 1970s the pastoral lease consisted of 14,000 ha. In 1976, 7000 ha of the middle section of the property (Class 1a) was predominantly above 1400m, was retired and classified Pastoral Occupation License (POL). This license was expired in 1993 and when granted will be administered by the Department of Conservation.

Land adjoining to the east is Glenworth pastoral lease, to the south is Crown Land (formerly Glenworth POL), and a small section of Class 1B(a) pastoral lease, to the west is Glenfleck pastoral lease and to the north-west is Upper Lake Horro pastoral lease. Other properties in the vicinity water-going streams include the Glenworth, Glenorchy, Northlife and Mt. Aorangi.

The majority of the property lies in the Mt. Peel Biological District, with the Rakaihi River Basin and "Double Hill" in the Matlock Biological District. Both districts have been surveyed by the PPA Programme in 1989 (April and June 1989). Five white or just BAFs were identified by the survey on Double Hill - Station 1 (Double Hill), Mt. Hut 1 (Double Hill) and Glenworth Stream), Mt. Hut 14 (Rakaihi Basin from remnants), Mt. Hut 20 (Selkirk Creek) and Mt. Hut 21 (Tuiwai).

### **PART 2 - CONSERVATION RESOURCE DESCRIPTION**

#### **2.1 Landscape**

##### **2.1.1 Context**

Double Hill comprises parts of three wider landscapes - the Horro Basin, upper Rakaihi River valley and the western slopes and valley of the Mt. Peel District.

The Horro Basin landscape covers the western side of Double Hill and includes Mt. Catherine and Class 1B(a) Northlife at the head of the Selkirk River, both areas identified

The upper Rakia landscape position of the northern faces of the Palmer Range, Black Hill Range and the Rakia River Basin. The Canterbury Regional Landscape Study identified the area as being of national value and is an outstanding natural feature and the range along the southern edge of the Rakia River is regionally significant. The Double Hill natural area comprises an extensive area of open flat and includes around one quarter of the total length of the mountain range along the south side of the river.

A third landscape context is the internal range and valley landscape, not at all 1980s from public viewpoints except by air. Double Hill forms a central part of this area, which has been identified in the Canterbury Regional Landscape Study as regionally significant.

### 2.1.1 Landscape units

For descriptive purposes Double Hill has been subdivided into 4 distinct landscape units. The attached map shows the location and boundaries of these units. For the purposes of the text, the units have been written together (Unit 1 Round Hill Valley and 2 Rakia-Godley Valley).

#### 1. Rakia Valley Floor

This area comprises the extensive open grassy Rakia River flat between Glenorchy Station Pass and Glenbush Station, a number of large alluvial fans spilling out on to the flats from the steep Rakia faces above, and Double Hill, a isolated double edged ridge maximum 200m in height and around 2 x 2 km in size which rises out of the flats as a major landscape feature.

The river flats are largely open and treeless, with a dense mainly exotic grassland cover, and a number of small but steep steep streams and localized wetlands. Large and often dense patches of mangrove are common, with some particularly tall old specimens at the very southern end of the flats.

The large alluvial fan very in appearance. The upper level of Suckie Creek fan is notified with cultivated paddocks and southern shales belts. The lower end of the fan and the river reaches lower angle fans immediately east of Double Hill transition into a more natural appearance with widespread dense mangrove and grass. To the west of Suckie Creek is a large steep grass covered classically shaped fan beneath Mt O'Connor, subdivided into paddocks but with no tree planting.

#### 2. Rakia Flats

The northern faces of the Palmer Range and Black Hill Range, stretching for 14km along the south side of the Rakia valley, are part of the "Rakia faces", considered collectively to be the most significant natural feature of the south side of the upper

Rainia valley because of their highly distinctive and highly visible natural form and their size. Approximately 5 km of them are within Double Hill provincial park.

The mid to lower slopes, rising from around 450-600m all to 1200m alt., are large, steep, generally unwooded and grassed, and recumbent to steep. They are deeply dissected by Glanville, Double Hill, Grand and Crown Streams and an unnamed stream to the west of Grand Stream resulting in a number of progressively steeper faces or 'blocks', which are more finely dissected by straight run channels and deeper gullies incised in their surface.

These mid to lower slopes have been subjected to a number grazing blocks and are overgrazed and eroded. Pencil pines are clearly visible in some places due to their straight up corner of the vegetation cover. The native grass cover is generally sparse, with a dense cover of exotic grasses. Nearly all the stream valleys and straight run gullies have a remnant cover of forest and scrubland.

The low grassed cover and the relative lack of visible natural modification contribute to the visibility of the landforms and subtle topography of their surface, and to their high overall resistance and natural appearance. The large scale and simplicity of the landscape is also emphasized.

The upper slopes are a deeply dissected steep open, valley and basin landscape, now almost unwooded with areas of scrub cover the slopes.

### 3. Palmer Basin

This is a broad open basin and plateau area at the head of Turner Stream overlooking the Rainia valley. Only the western half of the basin is in Double Hill.

Broad, rolling and scattered semi-glacial landforms are typical of the area, with a generally dense scrub and red mallee cover. The surrounding mountain slopes are high and steep with typically wide plateu steps. Scrub, forest ground and rock outcrop increasingly dominates with altitude.

The large scale and openness of the area, and the scattered rolling landforms accentuated by the southern forest mallee cover create a visually impressive landscape of highly distinctive natural character with the scrubland patches in the valley a notable landscape feature.

A boundary fence and a FWC track passing down the valley are the only obvious modifications on Double Hill. The upper slopes of the Palmer Range between 1200 and 1400 m have been cleared but are now forested with

### 4. Palmer-Addaxton Valley

This 12km long fluvial valley between the Black Hill, Palmer and Taylor Ranges is dissected by Turner Stream and the north branch of the Addaxton River.

It is a large, relatively straight and open wet valley trending north-south, with the valley floor almost flanking from around 700m asl to its lower end to around 800m asl at the upper end. The valley floor is made up of a narrow tertiary floodplain with minor terraces. Very steep, and dissected pre-cambrian side slopes rise above the valley floor to over 2000m. The upper slopes above 1000m asl on both sides are eroded from steep grazing but there is no permanent forest.

Vegetation cover is much sparser in this valley than around Tattler Shoals, with short tussock, herbaceous and *Carex* sward the lower slopes, intermixed with frequent sedge-patches, sedge, sedge and rock outcrop. Short tussock replaces short forest higher up, with sedge and rock becoming increasingly dominant with altitude.

A boundary line, a FWD track from Tattler Shoals to Crown Hill, Crown Hill and a bedding gullback line are the only obvious modifications but are insignificant in the scale of this landscape, which remains a high degree of apparent naturalness. The 4-w-d track is mainly an engineering project - (Gibson).

### 3.4.7. Seals-Godley and Round Hill Valleys

These are two large deep river valleys extending into the Palmer-Taylor Range and separating the existing high altitude natural areas of Sealers Hill and Glenaville Hills. The very long Seals-Godley valley flows east into the Marine Basin and is a major contributor to the Lake Stewson wetland. Round Hill Creek, some 5km long, flows east and is a major tributary of the Ashburton River.

Only the lower and left slopes of both valleys are within the basin with the exception of Godley Stewson valley which includes both sides up to 1000m. The two right of the Seals valley is in Glenaville basin and the two right of Round Hill Creek is the lower Glenaville PA, now Crown Land.

Both valleys are deep with a narrow tertiary river floodplains and high, steep, well-dissected flatter side slopes. Fluvial and periglacial processes have been dominant, with cirque and valley glaciation only obvious at the heads of the valleys. There is a small basin at the head of Round Hill Creek with Crow Hills saddle on its western rim. The area is underlain by the largest of the five tertiary rock outcrops in the district and an impressive karstic occupation forms the middle zone. A massive ridge runs down the eastern of the basin, formed by ice flowing down from the closest high on the east side of St Catherine.

Surface cover in the basin is varied including extensive sedge, bare ground and exposed rock especially on steeper faces and at higher altitudes, moorland and semi-moored moorland-*Cyperus* shrubland, *Chorophytum* dominated on steeper aspects, sparse short tussock with minimal herbaceous, large patches of cotton sedge, open to dense sedge tussock and sedge to sedge shrubland, rock and fern vegetation. The vegetation is best modified in Round Hill Creek owing to its higher altitude and tertiary aspect and a predominantly sedge tussock with *Chorophytum* on steeper faces.

An old boundary line is visible at the end of Round Hill Creek in the only man-made element in the highly natural landscape of this river valley.

## 4. Twin Valley

The south-facing greywacke slopes of Mt Catherine, rising to absolute elevations around 1000m to over 1200m a.s.l., form the east side of the north branch of the Twin River, and comprise two distinct slope basins and their lower valleys. Only the lower valleys are in pasture form. The valley side slopes and hill flanks between the valleys are sparsely and patchily wooded with some and primarily dense native forest alternating vertically across the slopes, rising to completely tree-covered summits, with numerous rock outcrops.

The lower slopes of the Twin River valley are underlain by tertiary deposits, separated from the planar greywacke slopes above by a fault running SW-NE through the Twin and Round Hill valleys. This country is more dissected, comprising a number of small hills and valleys. Unconformity escarpments can be traced along the valley, culminating in the impressive escarpment on Chest Hills saddle at the head of the Twin River. Bare ground is more apparent here with sparse stone and steel fences and widespread cover-crop the main ground cover.

The slopes above 1000m are eroded, but not forested. The Cheviot Hill boundary with Chest Hills runs across the lower slopes of the true right of the Twin although does appear to be an boundary line until the small side valley of Middle Stream near the mouth of the Twin valley.

## 5. Mt Catherine

This landscape well includes the west facing slopes of Mt Catherine a 1000m mountain between the Little and Twin Rivers on the Forest Hill side of Round Hill. Mt Catherine itself is very steep with extensive scree and rock outcrops on higher altitude slopes forming very steep colluvial cones on lower slopes. Only the lower slopes below about 1000m are in the bush. These lower altitude slopes are mostly vegetated in stone and forest forest grasslands and mixedwood shrublands, with some tall alpine scrubby right to the Bush foot. The landforms are typically parallel in character with a distinctive north leading ridge having steep side slopes falling away either side of a deep drain.

Round Creek, a large valley with a wide shallow meandering slope basin at its head flows the western face below Mt Catherine, with a large gently sloping alluvial fan at its mouth.

A boundary line, a pasture fence and a small building paddock are the only existing man-made elements. The country above 1000-1200m a.s.l. is eroded but is well forested.

## 2.1.2 Visual values

All of the mountain slopes forming the south side of the upper Rakata valley are considered to be a highly significant part of this visually spectacular valley landscape. Their visual value from the massive scale and contrasts of its dramatic, gradually curved mountain slopes accentuated by the predominantly uniform forested ground cover, the vast forested Rakata riverbed, and the large elevated fern and arum wet, partly undisturbed tree-fern-covered forest patches.

Virtually all of the mountain slopes and forest fern and tree facing the Rakata are clearly visible from the upper Rakata/Cairangi area - from the Alpitara Road on the north side of the Rakata, from the Rakata riverbed itself, and from Doodlakine Hill Bus Road on the west side of the river, there are spectacular views across the open expanse of the Rakata riverbed to the Palmer Range. From the Hill (short lengths of the winding Lower Rakata forest can be seen, and the openness and pattern of the post-Rakata glacial exposures).

The western slopes of Mt Catherine, from Basin River to summit, and the Great Hills Saddle dominate the view looking southeast from the Rakata-Basin Road to the Basin Basin. The Great Hills saddle is a large and obvious dip on the skyline, the only cut in the eastern enclosing ranges, with the limestone escarpment visible as a small hump in the middle of the saddle. Views of the saddle are framed to the north by the distinctive steeply defined, long, pyramidal shaped ridge leading north of the summit of Mt Catherine, and to the south by the bulk of the Taylor Range.

The internal range and valley landscape is not visible as all trees existing points viewpoints except by air. The Turtles have landscape, however, is a visually impressive landscape. As well, there are exceptional views out over the Rakata valley from the hilltops above Turtles Saddle.

## 2.2 Landforms and geology

The underlying rock is Tertiary greywacke and argillite with minor intercalation of conglomerate and sandstone. Permian volcanic granites form the peaks and create mountain slopes. The basement rock of the Rakata River is greywacke and argillite, but is overlain by recent alluvium and loam. In the head of North Branch Basin River around Great Hills Saddle there are outcrops of tertiary limestone deposits.

The major landform groups on the property are:

- high relief, steep mountainsides of the Palmer Range with moderately wide valley floors in the tributary systems of the North Branch Ashburton River and headwaters of the Sator/Godley catchment.

- plant, very steep, gradually rounded slopes along the "Rakau Hill" (shown by several very steep-sided gullies with waterfalls and cascades (Dunstan's, Double Hill, Colwell and General Streams))
- an alluvium basin (Towers Valley) comprising several terraced, low-relief terraced terraces and alluvial fan surface deeply dissected by tributary streams of the North Branch Ashburton River, and adjoining recently constructed mountain roads.
- alluvial fans of Native, Double Hill Streams and O'Connell Creek
- low terraces and river fans, multiple old river and flood channels of the Rakau River
- Double Hill, a rugged mountain, a symmetrically shaped, low relief hill, with rounded to the top, a "nose" and very long wide taluslopes.
- the Double Hill fault, marked by a line with clear scar - consisting in "stepped" ridge tops and increasingly mountain slopes.
- extensive and narrow front Pleistocene glaciers along lower hillslopes in the River basin

## 2.3 Vegetation

The vegetation on Double Hill consists broadly of:

- Openness and highland microclimate of introduced grasses with sparse silver and forest trees on the Rakau fans
- Forest wood, grasslands on (and below 1400m throughout the North Branch Ashburton River) alluvials, and River bank woodlands
- Tall woodlands throughout on slopes above 1100m
- Localised wetlands and floras
- Forest remnants in sheltered gullies along the Rakau fans
- Woodlands on alluvial fans and south facing slopes of Double Hill

Openness and highland slopes

On the north-facing slopes of the Palmer Range (the Rakau fans) below approximately 1400m, on "Double Hill", and on the alluvial fans and riverbanks between the river, the vegetation is predominantly improved grassland.

Thick stands of native grasses and herbs are predominant with sparse *Yucca*, *Artemisia*, silver and brush manzanita, increasing above 1000m. The main grasses are *Yucca* big, shrubby, cultivated below 800, tall tall grass, and several deep red along with occasional bunches and two-grass. Other native species on these slopes below 1000m are scattered manzanita and brush. Besides the grasses the main herbs are also predominantly native - white and red clover and occasional localized patches of Californian shrubs.

These slopes are dissected by narrow straight run gullies, with a forest and wood cover. Above the top limit of approximately 1200m there is a sharp transition to Chionochloa stand more brushlands and native manzanita plants.

#### Open / Low brushlands

These are the "unimproved grasslands" below 1100 m (i.e. areas that do not appear to have been overgrazed and hydroseed). These occur in the North Branch Ashcrofta River, Turton Stream and the foot of Mt. Catherine in the Horse basin. The vegetation is mainly scattered brush manzanita with scattered cotton daisy (*Chalcidopsis* sparsiflora), as well as tall bunch (Poa robusta), some small *Stemmadium* subsp. *bracteata*, dwarf bush (*Leucopogon* *flavescens*), the herbaceous (*Astragalus* *spinosus*) and *R. polytrichus*, and in some areas *Panicum* *rubens*. Bare ground and gravel is common, sometimes reaching 50-70% in places. Other indigenous plants in the community include *Alysicarpus* *procumbens*, dwarf manzanita (*Chionochloa* *depressa* var. *sub-culmifera*), *Brachyelytrum* *strictum*, *R. hillebrandii*, *Ranunculus* *obovatus* and *Chionochloa* *crassa*.

The *Ranunculus* stands differ from these habitats, in being grazed, with sparse bunch cover and very little bare ground. They are predominantly covered by brushland grasses - mainly brome and some vernal, along with white clover and scattered brush manzanita. Near the base of Mt. Catherine, particularly on deeper soils - tall sedge, shrubby and *Yucca* big are common. On more heavy ground closer to the Kaimosi River lower up and more vernal are dominant, as well as *Yucca* big and sedge-like grasses. Manzanita is usually scattered throughout, along with brush and other bunch. Near small streams and poorly drained ground there is often one large species, *Poa*, an exotic fern (*Polypodium* *obovatum*) and bunch ridge (*Chionochloa* *pusilliflora*).

#### Tall brushlands

Tall brushland grasslands of *Chionochloa* *crassa* are the predominant vegetation throughout the property on mountain slopes above 1100m (i.e. on the Kaimosi slope, in the Turton/Middleton River catchment, in Royal Hill Creek, Twin River and the flats above Lake Haro). Bunch cover is mostly ground 50-70%, sometimes less, but not often more. They are the most dense and most extensive on low angled slopes such as around Turton saddle and in localized valley heads. The manzanita vegetation in some areas is made up largely of cotton daisy (*Chionochloa* *sparsiflora*) where manzanita more widely spread, brush manzanita, big bunch, dwarf manzanita, *Ranunculus* *obovatus* and dwarf bush. *Alysicarpus* *procumbens* is common



throughout, particularly in areas below 1000 m and on steep covers of between 50-100% in places. On north facing slopes and on steeply gully faces *Desmodium illinoense* replaces other species distributed with *Chamaecrista nana*. Above 1000m in Round Hill Creek and the Twin River-Cabela gully, other than *Chamaecrista nana* is the commonest species and other common species in this stratum are *Rhus glabra*, *Hamamelis*, and *Asplenium platyneuron*.

*Chamaecrista nana* (Broad-leaved vetch) occurs especially on Double Hill but appears limited to Round Hill-Creek, the Twin River and to a limited extent on the Roubida River. It occurs in two main types of situations - firstly on steep, shady and often rather gullies usually with *Desmodium illinoense*, certain ferns, and *Schizanthus*, and secondly it also occurs on some north facing gently sloping rock as above Clear Hills Saddle. Here the main associates are the ferns *Cheilanthes lanuginosa*, certain ferns and other ferns, as well as *Rhus glabra* and *Rubus cuneifolius*.

#### Red-tanwoodland

Red-tanwood occurs on Farnham Saddle, as small patches in the north of "Double Hill", in Round Hill Creek, and as small groupings of individual plants on the Roubida River this most common. It could also be on other high sites on other parts of the property not inspected.

On "Double Hill", red-tanwood occurs at the upper end of the wide, gently sloping north of Double Hill but amongst sparse grassland. With the exception of some peripheral areas of silver-tanwood, the herbaceous plants are all small - mostly *Taraxacum* sp., *Senecio*, some annual and white clover.

The red-tanwood in the head of Round Hill Creek near Clear Hills Saddle also has some brown top and some annual but includes big ferns *Chamaecrista nana* and *Carex* species.

The red-tanwoodlands on Farnham Saddle are the best and most extensive red-tanwoodlands on Double Hill, occurring on dry as well as less well-drained sites amongst *Chamaecrista nana* and ferns *Chamaecrista*. With the red-tanwood on water sites or big ferns, *Chamaecrista nana*, *Senecio*, *Senecio*, *Senecio*, *Senecio*, *Senecio*, *Senecio* and *Senecio* species. Dry areas have lesser tanwood, certain ferns and *Chamaecrista nana* between the red-tanwood.

#### Woodland

Small localized red areas or patches are characteristic of Double Hill and Clear Hills Stream sides and areas of the Red Hill from along the Roubida River. Commonest plants in the most common species on these sites, and depending on drainage and the modification there are also *Carex stricta*, *Senecio* and localized ferns such as *Rhynchospora purpurea*, *Senecio* sp., *Senecio strictus*, *Senecio* sp. and *Senecio* sp.

At the base of Double Hill there is a small *Saxifraga* wetland area (see map) instead of *Juncus* grasslands. Much of the past the wetland is dry and springs in the future are occupied by *Utricularia* *maculata*, and *Phragmites* *communis* or part *Lepidocarpus* *marginatus* *var. laevis*. This wetland is part of an RAMP, Habitat 1.

## Forest

Small patches of forest remain on the property in steep-sided bluffs gallics that almost the southern slope of the Palace Range, and is isolated from average woods on the steep side-slopes of Double Hill. The two largest patches, at the northern end of the property are named as Imperial woods at the Glenville and Double Hill Ravines (Double Hill being the one further west). These two woodlands contain the largest remnants of forest on the property and along the length of the Balala Burn.

In both areas the forest is mixed broadleaved forest broken by thick and patches of heath forest. The broadleaves are mainly lancewood, broadleaf, mountain three-finger (*Phoradendron* *colobium*), golden sassafras (*Alnus* *resinosa*), *O. occidentalis*, mountain yellowwood, mountain and laurel. The understorey is dominated by *Phlegmaria* *imposita*, *Cypripedium* *pubescens*, *C. robusta*, *C. junceum* and *Mata* *scutellata* with lots of prickly shield fern, *Asplenium* *platyneuron*, *Blitum* *chamberlainii* and *B. peruvianum*. *Chorizanthe* *lyallii* is a common ground cover, especially closer to forest edges. Cabbage trees grow more prolifically in Glenville Ravine, than in Double Hill.

Other steep sided gaps that contain forest remnants such as Colwell Ravine, Grand Sycamore and the various lawns, are dominated by the same broadleaved trees as Double Hill and Glenville Ravines. Colwell Ravine and the adjacent woods in the east also have scattered heath in mid-slopes, but Grand Ravine has only broadleaved trees and a limited area of marginal scrub of manzanita, *Cordia*, and *Myrsine* (*Myrsine* *propinqua*). Colwell Ravine also contains *Mata* *lyallii*, an uncommon species in Canterbury, particularly in the high country.

On the steep south facing wall of Double Hill, across the road, (between the 20 point) there are areas of scrub and forest. The trees are broadleaf, mountain laurel, and laurel with occasional lancewood, mountain three-finger, (*Phoradendron* *imposita*) and cabbage trees. The scrub surrounding is manzanita, (*Myrsine*), *Cordia*, *Juniperus* *stricta* (*Melicope* *opifera*), *Alnus* *resinosa*, *Utricularia* and other forest.

## Shrubland

The main type of shrubland on Double Hill is manzanita which occurs on steep, low, rocky faces, across sites, in the north and eastwards of Double Hill and in scattered clumps across the Balala riverbank and collated slopes of the Haro burn.

On the face of Balala Creek and Glenville Ravine - manzanita is commonly scattered, up to 2m high over a ground dominated by *Myrsine* and *Utricularia*

along with *Agrostis pilosa*, *clavata* and *capitata*. At Garden Creek, the vegetation is much denser, taller, larger in total cover than other, and includes several 90 species in the middle of the list. *Chenopodium* biomass has some levelled, but not the same quality.

On "Eastern Hill" management is done on south facing slopes of the "bushes" and on the south facing wall of the hill, except the Double Hill Road (described under wetland above). On south facing slopes of the bench, other slopes mixed with the management are managed (Cyperus polycephalus and *Setaria*, some *Artemisia*, *ambrosioides*, the fern (probably *Asplenium platyneuron*) and *Asplenium nidus*), as well as a general cover of *Asteraceae* *peruviana* and *Asteraceae* *spicata*. Within a small gully there are also stands of *Chenopodium* *ambrosioides*, *Aster* *truncatus*, *M. subspicata*, *Artemisia* *viridiflora* and *Chenopodium* *sp.* These stands are part of an RMP, Marine 1.

On the Lake House side of the property no vegetation, particularly in shallow gullies and other slopes described, dominated by management are common. There is usually a mix of other species including *Artemisia* *ambrosioides*, *Chenopodium*, fern, *Artemisia* *viridiflora* and sometimes also *Aster* *truncatus*, *Carex* *crispata*, and *Chenopodium* *sp.*

In already above hills, there are limited areas of disturbed, often mixed with some *Artemisia* and usually dominated by *Chenopodium* *ambrosioides*. Other stands that occur at this altitude are *Artemisia* *ambrosioides* (only located in Broad Hill House and above Double Hill Street), *Artemisia* *truncata* (*Perforata* *spicata*) - above Double Hill Street and small localized areas of some others.

## Wetland

Wetlands are limited on Double Hill - there are some natural forest plants on the front hill west of the Palmer Range, and in the lower River. Other sources of potential weed spread are *Panicum* *maritimum* and grass sedge (*Alopecurus* *spicata*) planted by the Conservation Board in the stream south of Cooper Street in Glenelg, as well as willows in Tarwin Street. Marine Council has also been a problem in the past along the Balnave beach. Its status on Double Hill is not known by the Department.

## 2.4 Fauna

### 2.4.1 Birds

A brief faunal survey was carried out the former reserve and birds were also recorded during the vegetation field work. The information presented here is therefore limited by the ground and vegetation covered. Birds recorded in the forest remnants located in the deep, steep-sided gorges of the Balnave have included *Callipepla*, South Island *formica* and the South Island *colinus*. In the open *hemimachus* NZ, *gallinula*, *Acridothera* *flavipes* *flavipes*, *luna*, and *luna* (a category B threatened species) were recorded. At the confluence of the Tereka and Gedyka Rivers a large colony (upwards of 80 birds) of *Actitis* *leucorhynchos* gulls were nesting.

## 1.4.1 Insects

Common insects (*Lasiopoda* sp.) appear moderately abundant in the grasslands and common grass (*Styphelotrichum* sp.) were observed in many areas. Other birds reports that could be present in this kind of this country but were not seen, are the endangered vireo vireo (*Lasiopoda virens* from "virentes"), the spotted vireo (*Lasiopoda leucostictus*) and the greater grass (*Styphelotrichum*) grasses.

## 1.4.2 Invertebrates

Alpine area (*Styphelotrichum* sp.) were common on grasses, heather fields and forest areas in the natural grasslands. The same area, *Styphelotrichum* virentes, is likely to be present in the extensive areas. The alpine grasshopper *Agrostis alpestris*, *S. villosa*, *Pogonocherus* and *Styphelotrichum* were found throughout the heathlands on the property.

## 1.4.3 Freshwater Fish and Invertebrate Fauna

Double Hill, Glenashville and Tutton Streams are the main waters occurring within the general area. Double Hill and Glenashville Streams are important salmon spawning tributaries of the Salween. They are also known to support brown trout, brooktrout and rainbow trout. More information on these sports fish and genetics is included in Section 1.6.1.

Freshwater database records show that native species present include long-finned eel, common river galaxias, splined belly, alpine galaxias, brown and lamprey. Long-finned eel are also likely to be present in some of the streams draining into the forest basin.

Tutton Stream and a small tributary were electro-fished in January 1994. Alpine galaxias were abundant with common river galaxias, splined belly and brown trout fingerlings present in lower numbers. Several schools of galaxias by were observed. These were probably common river galaxias.

The invertebrate fauna of Tutton Stream are typical of high elevation, within-forest streams with good water quality. Mayflies and caddis dominated the fauna. In addition the larvae of swimming midges (*Alpharacanthidae*) were present on riparian - also indicative of water quality.

## 1.5 Historic values

The first parts of what became Double Hill were taken up in 1858 by Colonel Alexander Lees. He and subsequent owners added land at regular intervals until around 1911 when it included the present-day properties of Double Hill, Glenashville, Glenashville and Redcliffe.

The only known historic places on the property are the cadastre and railway, both

on footpath. In the 1980s Essex's Remains Inventory of North Hants/Downham was the status were noted as being of local importance, but the corridor was given a regional interest rating because it was an excellent example of road and road construction and visually attractive in its own right.

## 2.4 Riverbank

### 2.4.1 Access

Legal access to the pasture lands is possible from the development of Balnais Camp east of the property via a legal road following for most of its distance the former, Devine Hill Road and a side road, Cross Road. According to the cadastral map, however, this connection between legal road and limited road (Status of the Incorporeal and does not continue on west to Cheshamstead Farm where Cross Road diverges from the Devine Hill Road. Legal, unimproved roads also run into pasture lands up the Saxon River following approximately the westerly, and more or less up the Veils, River were Cross Hills Saddle and down Round Hill Creek. This latter route does not follow any limited or practical foot access.

Access from the Balnais River is possible via Section 24 designated strips (formerly Section 28 Land) that respect which have been laid off either side of Gloucester Stream across Chesham's footpath. A legal road then follows the approximate line of Gloucester Stream south from Chesham's footpath across Tarnow Saddle and down Tarnow Stream to where it meets the North Branch Adderton River. This, however, is not an easy line to establish on the ground - it follows neither the stream banks nor the 4 wheel drive track. This also means that access to Tarnow Saddle requires permission from Chesham's Incorporeal, i.e. there is no legal arrangement for Devine Hill Incorporeal to gain access to the Tarnow-Adderton Valley. Devine Hill is also land locked on the Saxon River side - access to Devine Hill is required from the houses of Upper Lake House and Cross Hill. POC from the North Branch of the Saxon River on Cross Hill.

Access for anglers along the banks of Gloucester and Devine Hill streams is by legal arrangement only. For access to the Balnais River, a legal road crosses the 3rd north-south corner of the property meeting at the Devine Hill Road and ending in the Balnais River through Chesham's. The former 4 x 4 track along the base of "Devine Hill" does not follow the legal road, however.

At the time of the POC, easy public access was negotiated from the Adderton River up Boundary Stream via Chesham's to the Taylor Range and across Cross Hill Saddle to link up with the Devine Hill POC, and to link with the legal road to the Saxon River (via Cross Hills) providing legal access to the captured POC.

### 2.4.1 Land Use

There is currently little recreational use of Devine Hill. The area beyond Tarnow Saddle and in the North Branch of the Adderton River has come out from existing pasture gaining access to the lower reaches of the Adderton River. The stream on

the top of the original POC, it was technically inaccessible and not easily accessible from the Flat and Glenaville for launching.

There are opportunities for jumping trips through Double Hill (and Glenaville) via Taitona Saddle, following Taitona Stream to Campy (the flow Round Hill Creek and over Chest Hills Saddle and the north branch of the Raika River. This currently requires permission from the trustees of Glenaville and Double Hill to gain access to Taitona Saddle and Round Hill Creek, as well as permission from the trustees of Chest Hills to go down the river along using the loop to the legal road in the loop and upper Round Hill Creek. This, however, requires very precise navigation skills and is not a practical route to follow. There are also possibilities of trips down the Awharua River at Alfred Point if the river is sufficiently low or a road trip down the North Branch of the Awharua and return via the South and Pacific Saddle via Glenaville - again requiring permission from adjacent owners.

### *Sports fish and gamebirds*

Double Hill comprises a number of habitats areas for sportfish and gamebirds. Glenaville and Double Hill forests are ecologically and nationally significant Quaternary sediment spawning areas. Double Hill Plain Forest is one of the major spawning areas for salmon in the Raika River. Brown trout and spawners fish. Glenaville Forest is an important trophy trout fishery due to significant numbers of large resident brown trout and also a vital spawning area for trout occupying the main Raika River. The nearby Raika River is a popular area for early season trout angling (from October 1) and salmon angling from December to the end of February.

There are no long-term historical records or information on gamebirds that Canada geese, partridge, duck, mallard and grey duck all frequent the area. Partridge ducklings have been known to congregate on "Double Hill" (the hill) as an area of wetland during the month. They have also been observed at a ponded area of water near the base of Double Hill along with other waterfowl. Intensive harvesting of waterfowl by hunters does exist, but is what extent is not known. The NZPC Council suspects it is low. Upland gamebirds such as California quail and stinker do exist, but their numbers do not attract much attention from hunters.

The tops of the surrounding ranges are very open and offer little cover for deer, and chamois. During the survey most of these wild animals were observed, although there was plenty of signs in Round Hill Creek.

## **PART 2 - CONSULTATION AND DRAFT PLANS**

### **2.1 Consultation**

A NZPC meeting was held in the Christchurch EOC office on 11 February 1997 with representatives from EOC, North Canterbury Conservation Board, Save Our Rain Coalition, Canterbury Environment Trust, Forest and Bird, and Waimatiri Protection Society to discuss a number of issues including stream control. A draft outline of some of the issues and interests on Double Hill, was made to the group

and an intention to do it (that is, it will be my intention, they may intend) (1994, p. 16). No contract has so far been reached.

## 5.2 **Stated Plan provisions**

Doubts Hill lies within the Ashburton District. The proposed District Plan was notified in March 1994. Under the Plan Doubts Hill is zoned Rural C (High Country). The plan also identifies areas on the property that are of significant conservation value – Area 5 covers the Baleno River bed and the beds of Doubts Hill and Glenville Streams on the Run (GORE); Area 6 which covers Mt. Hill RAMP 14 (Baleno River Forest remnants), Area 7 is Mt Hill RAMP 22 (Tussock habitat), Area 11 is Mt Hill RAMP 1 (Doubts Hill), Area 12 which includes Mt Hill RAMP 3 (Doubts Hill and Glenville Stream), Mt Hill RAMP 18 (Doubt Colley), and the 20 hectare corner of Mt Hill RAMP 20 (Doubt Creek). The Kaiti Kōwhiri is an area of landscape importance.

For areas of landscape importance, areas of significant conservation value, riparian<sup>1</sup> and alpine environments (areas shown 1000a) on Doubts Hill the following rules apply:

- No earthworks to exceed 20 metres<sup>2</sup> in volume or/and 20 metres<sup>2</sup> in area in any one location 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 location in any continuous period of five years, except for forestry plantings.
- No exotic tree planting, except forestry tree plantings (and in the case of riparian management areas - to include tree planting intended for commercial purposes).
- No buildings to be erected.

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

For general "natural conservation values" except for what is provided for in the rules above, there shall be no clearance of indigenous vegetation (other than transport), which has an average maximum height of the canopy of greater than three metres, shall exceed 100 m<sup>2</sup> in any area in any continuous period of five years.

<sup>1</sup> any land within the bed of a lake, river or stream, within any naturally occurring wetland, within a lake, river or any lake, or flow of any river or stream (other than the sub-area of the Baleno River below Lake Forest).

## PART 4: RECOMMENDATIONS AND IDENTIFICATION

### 4.1 AREAS TO BE FULLY RESTORED TO THE CROPS

- It is recommended that one large area be retained in Crown ownership and be managed by the Department of Conservation. This is:

1. **Turton Saddle - High Plateau Area - Glenelg-Double Hill Stream - Round Hill Creek - Santa-Catalina Valley - Mt Catherine lower slopes**

This area covers approximately 3,000 ha of the upper catchments of Double Hill, Glenelg Stream and Colwell Streams, the high altitude north facing slopes of the Winter Range ground to and including Turton Saddle, all of the catchment of Round Hill Creek and the upper catchment of the North Branch Santa River, the Santa-Catalina River catchment and the lower west-facing slopes of Mt Catherine between the existing retirement line and the proposed lower boundary.

- The "upper catchments" are the forest remnants extending from the river flow to the PCL boundary. The high altitude forest are those above the snow line which covers the north facing slopes at around 1400m and marks the boundary of short tussock grasslands with the *Chamaenerion* native grasslands. Turton Saddle is the wide saddle between the area at the head of Turton Stream. This recommended area continues downstream of Turton Saddle and into the catchment of Round Hill Creek, upper Santa Valley, the west-facing sub-slopes of Mt Catherine and the Santa-Catalina River catchment.

#### **Balance**

- These main catchments, Turton Saddle, the upper Round and Mt Catherine have together represent an extensive area of high natural value. It encompasses the largest area of tall tussock on the property (Turton Saddle) and is part of the most extensive and least modified area of tall tussock in the ecological district. The vegetation cover is largely intact with a limited number of introduced species.
- Turton Saddle, upper Santa Valley, the upper catchments of Double Hill and Glenelg Stream, and Colwell Stream have been identified as RMA in the Mt Hamilton PCL survey (MfM RAPs 22, 23, 14 and 3).
- The tall tussocklands on Turton Saddle are one of the largest areas of tall tussock in the ecological district, they are not common in the District and only occur on mountain slopes and rocky banks in one other RAP.
- The mixed hardwood and broad forest remnants including Glenelg and Double Hill Streams are valuable remnants of a once much more extensive forest cover. These are the largest remnants of forest tall on the property. They are also the largest forest remnants on the Balance (east end of the four properties under review (Glenelg, Round Hill, Glenelg and Double Hill). Both areas have a high diversity and abundance of species, and high naturalness - which is an international objective in the ecological



domin). These catchments are identified as an RALP in the Mt. Ruapehu report (Table 3).

- It includes the two streams to the east with broad catchment (Colony) and an unnamed stream - all derive protection because they represent the vegetation that originally covered the plateau slopes above the Rakaihi Forest. The occurrence of these trees in an increasingly wet to Coldest Ocean zone are important to protect as these trees are amongst the highest in New Zealand in this climate. They do not occur elsewhere in the ecological district and are uncommon in Canterbury. These two catchments and Great Stream are identified as an RALP (Table 3).
- The South-Grey and Kaitaki Hill Creek catchments have high natural values with an diverse cultural significance and a variety of vegetation cover including shrub and open forest, riparian and subalpine woodland.
- The South River and its tributaries from the second largest catchment feeding into the Lake Taupo wetland, the largest wetland in the Three Basins and one with very high natural value.
- All parts of the ranges enclosing the south side of the Rakaihi are of landscape significance on account of their high visibility, their large scale, clearly defined and spectacular glacial forms and their role as a setting for the South River. The upper Rakaihi basin are highly natural in appearance. The uniform dense snow cover imparts high visual coherence and simplicity highlighting the topography.
- The Turoa Basin area is visually very impressive and distinctive due to the ridges and domes more snow cover over the smooth rolling foothills and an absence of fracturing elements, imparting a sense of large scale, simplicity and coherence. The strong visual contrast the basin landscape has with its surroundings contributes to distinctive natural character.
- The Double Hill and Greyhills Stream valleys are a highly visible and distinctive element of the range landscape on the south side of the Rakaihi Range and make a significant contribution to the surrounding natural landscape of the valley. They are the largest of the subglacial stream valleys formed like the Rakaihi River, and are visually very impressive due to their vertical approach, bluff side walls and their forest cover, seen whether close along this side of the Rakaihi.
- The ranges enclosing the east side of the Upper Basin between the South River and Quaker Saddle on the Mt. Somers Range are part of the landscape identified as being nationally outstanding in the RALP and LA 1995 Regional Landscape Study. Their enclosing skyline ranges are a highly distinctive and visible part of the Basin landscape. Their very steep, high, rugged snow covered slopes provide a striking natural backdrop to the Basin and particularly to the view across Lake Taupo from the Hectors-Brown road just north of Mt. Aorangi National. Its only publicly accessible part of the Lake Taupo shoreline.

- The Chest White Saddle at the head of the Falls River is the only saddle of this size along the eastern ranges and is a skyline focal point, and distinct natural feature of the Forest Basin with a limestone escarpment directly but clearly visible on its north.
- The western and northern slopes of Mt Catherine are a significant part of Basin including eastern ranges being about a quarter of the total length. Here they are important in framing the view of Mt Cathedral from the western side of Lake Huron and are the lowest and highest part of the topography to the Lake. The very clearly defined pyramidal ridge leading south off Mt Catherine is a very distinctive and visually prominent natural feature of this part of the Basin, framing the view of Chest White Saddle.

#### Management and boundary issues

- This recommended area is contiguous with areas recommended on an adjacent property - Glencliffe. It is also geologically and visually continuous with the central areas on the upper slopes and summits of the Palmer Range (Double Hill PGL). If protected, the Terrace Basin and the upper Babine Basin would result in one large contiguous 'core' by providing a link between the currently isolated natural areas of the Palmer Range and (West Hill (formerly Glencliffe and Double Hill PGL)). It also provides a more natural boundary than currently exists, with the inclusion of complete valley cross-section rather than only the upper halves of side slopes.
- Some fencing will be necessary on Double Hill and Glencliffe to exclude stock from this area but should be minimal if existing fence can be used. Some fence lines should not be followed to avoid visual cluttering and introduction of noise. A fence already exists along the Babine Basin above the Bryant Spout and Glenwood brooks. A new line for a fence will need to be investigated on the North Branch of the Falls River to keep Chest White Stock from grazing the protected area and a fence may also have to be built along the top of the spur leading northwest from Carey's Hut, depending on the outcome of protection to the Terrace Saddle/Terrace Stream area.
- An easement in favour of Double Hill (and Glencliffe) would be necessary to allow the stream to more closely to and from the lower Terrace if grazing is to continue in the lower Terrace.

#### 4.2 COVENANTS

The following three areas are recommended to be protected by covenants - managed by various agencies.

##### 1. Double Hill

This recommendation covers the entire footprint of Double Hill and the floodplain wetland at the mouth of the creek.

##### Recommendation

- That this area be protected by a conservation easement to maintain the landscape (visual) values of the "Double Hill" landform and protect the developed remnants on north facing slopes and wetland. The easement is to be managed by the Department of Conservation.

#### **Background**

- Double Hill is a highly visible and very distinctive (steep) natural landform located at the upper Kaitake valley. It is immediately adjacent to the wide wooded Kaitake (remnant of intertidal) appearance and surrounding natural landscape values at a regional level. It is the only landform of its kind and size in the valley of the upper Kaitake valley.
- There are remnants of dense mixed shrubland cover on the steep north facing side of Double Hill. There is very little tall of indigenous vegetation cover on these generally wooded landforms in the Kaitake River (Double Hill) landform. This has the highest natural value of any in the landscape. The shrubland remnants on the north side of the rock, a surrounding area and the wetland at the base of the hill were recommended for protection in the Mt. Hutt/Maitake PMA report (District MAP 1, Double Hill).

#### **Management and boundary issues**

The main threat to the landscape value of Double Hill is over planting, as is evident on the west. Burning and physical clearance is a threat to shrubland remnants. The objective of the easement would be to allow for continued pastoral use but maintain the integrity of the landform and its relationship to its setting to an open plain, and permanent protection of the native shrubland on the steep north slopes and wetland at the base of the hill (regional setting).

There should be no new planting on or around the hill, and stock excluded from the north slopes. Part of these slopes are already fenced off forming a narrow area adjacent to the road including wetland and wetland at the base of the hill. Good shrubland views of the Kaitake valley are possible from the top of the slopes.

#### **2. Kaitake Flats and lateral flow**

All of the remnants on the north side of the Double Hill (Kaitake road) and within 500m of the road on the north side, between Chasemills Stream and Goodriches Stream, the large grassy lateral flow below Mt O'Connell, and the lower Station Creek has wide extensive dense managed cover.

#### **Recommendations**

- It is recommended these Flats and Cuts be protected by a covenant administered by an organisation other than the Department of Conservation. The aim of the covenant would be to retain the open grassland character of the flats and to preserve views of the Kaitake River and basin in their entirety. The covenant should also be designed to maintain/improve the natural character of the wetland and wetlands on the flats and to maintain the integrity of the flat landforms and the natural undisturbed appearance of the lower Kaitake Creek flow, with its dense (natural) cover.

## **Rationale**

- The open wooded nature of these grassy fields is crucial to public appreciation of the spectacular upper Balkan valley, its particular views of the highly distinctive Double Hill and the glacially smoothed topographic lower slopes of the Palace Range from Double Hill. This view will be from the Balkan riverbed.
- The wooded character is also typical of the natural landscape of the Balkan riverbed and is considered to make a significant contribution to the outstanding natural values of the Balkan riverbed.
- Towards the western (upstream) end of the flow, dense tall managed woodland remains. There are also a number of small but deep and clear streams and several wetlands meandering over the flow. These should be maintained or restored to a natural state (eg, removal of existing willow).
- Grasslands and Double Hill Scrubland which cover these fields contain the most diverse and abundant bird fauna on the property and are very important for nature spotting and viewing.
- Woodlands with especially mixed cover such as these are no longer common in cultivation, tree planting and subdivisions cover and these characteristics as part of a wider natural landscape are worthy of protection from development.
- The alluvial fans are large and well-defined natural landscape elements of the upper Balkan valley floor, particularly the large grass-covered fan of Double Hill under the O-Center, despite subdivisions, fencing and pasture improvement. All other large alluvial fans such as those in the upper Balkan have been substantially modified by cultivation, subdivision into paddocks and shelter belt planting.

## **Management and boundary issues**

- Tree planting is probably the greatest threat to the landscape values of the flow, which would greatly alter the existing open wooded grassland character and reduce the natural flow in disturbance of the valley floor. The main threat to the alluvial fans is cultivation and tree planting, subdividing and fencing their natural areas. Factors such as views of Double Hill and the tall heights and length of the striking Balkan Pines which can currently be enjoyed could be greatly reduced or completely lost. Subdivision and cultivation with clearance of vegetation would also reduce the natural character of the flow, important in the setting for Double Hill and being adjacent to the outstanding Balkan riverbed. Topsoiling could adversely affect the quality of the streams and wetlands.
- There should be no tree planting, cultivation and clear-cutting on the north side of the Double Hill Road. On the south side there should be no tree planting within 500m of the road. Subdivision and cultivation on the flow would not be inappropriate as long as natural boundaries such as streams or flow edges were followed and a buffer provided of

a least 20 metres (provided ground allows). There should be no replanting on the large grasses but although planting around the rim-planting, its form would be acceptable (rows of it from the road could be obscured however), and no native shrub clearance, maintenance, cultivation or tree-planting on the other two faces.

- There should be no replanting within 10m of streams or wetlands over all the faces and the protection/trimming of Double Hill and Glenavilla Streams should be investigated in line with any Fish and Game recommendations.

## 2. Kataka River

These are the plateau rockface hill faces from Kataka valley flow to the existing road/footpath at 100-110m a.s.l. between Donald Stream and Double Hill Stream and the other straight and steep/wall face at the end of Glenavilla Stream valley (steep slope) far east of Double Hill hilltop/ridge.

### Recommendation

It is recommended these faces be protected by a covenant administered by an organisation other than the Department of Conservation. The aim of the covenant would be to protect the currently highly linear and relatively unfragmented and natural appearance of the whole length of these slopes.

### Background

- These hill faces comprising 12km of the road (like length of the headform type, are considered to be the most important natural element of the ranges on the south side of the Kataka River, despite pasture improvement and maintenance farming. Their high rise, and their road length (including Mt O'Connor), their relatively low rocky glacially smoothed surface, the rockface form, and the straight run towards and perpendicular gullies (which in their earlier condition made them highly distinctive and impressive headforms, creating a very powerful visual image). The slopes between Donald Stream and Double Hill hilltop/ridge are the highest and most impressive of all the slopes.
- The hill faces are completely visible as clear ranges (less than 2km) from the Double Hill that road, and dominate the view south from the road from Donald Stream to Glenavilla. The faces are also highly visible and can be approached from in their entirety from the Algonia road across the Kataka River 4-5km away.

### Management and boundary issues

- The biggest threats to the value of these faces are working, industrialised agriculture and tree planting, particularly fragmenting and visually covering these slopes and obscuring the surface patterns. The main threat to the overall face is farming, cultivation and over-planting, destroying its natural structural unity and obscuring and fragmenting its natural form.

- There should be no roads or tracks bulldozed on the Flats as they planned. The large areas of cleared and burned forest floor in the gullies (documented separately under 4.11) should be protected from burning, so any burning on the Flats between should be carefully controlled so as to avoid any damage to the forest gullies.

#### 4.3 ACCESS ARRANGEMENTS

The main requirements for access are for anglers to gain access alongside Double Hill and Glenaville Streams on the Double Hill side, to the Balnainn River on the north of Maudsley Point, and for anglers to get access to the Palmer Range, Tarras Saddle, the South River and Maudsley Point. There appears to be an anomaly in that according to LINC maps the road beyond the gate to Double Hill Station (Palmer Road) does not appear to be on a legal plan, so there is no legal access to the Upper Station, including to Glenaville and Maudsley Point Stations.

#### Recommendations

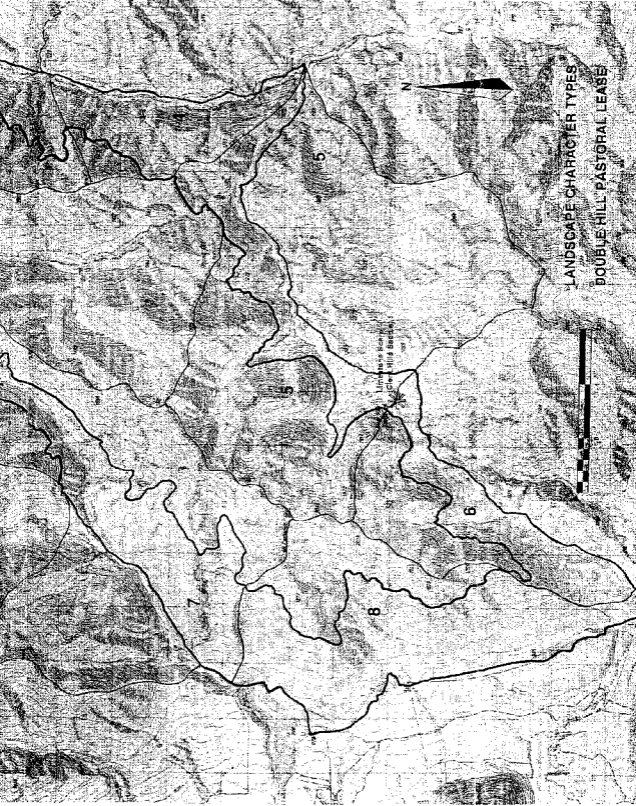
- That an easement be drawn up in line with Fish and Game requirements alongside Double Hill and Glenaville Streams.
- An easement be surveyed off for the track cut to the Balnainn River just to the east of Double Hill (for walking, and 4 w.d. access).
- An easement be surveyed for walking access from the end of Flats to where Glenaville Stream flows out of its hillside gorge (following a 4 w.d. track), and then splits up the western rim of Glenaville Stream to the area to be retained by the Crown (signs and axles will be required).
- To investigate the current state and the requirements for providing legal access to the upper Balnainn valley (including to Glenaville and Maudsley Point Stations) and the connection cut to the upper Balnainn by vehicle on the forest road.
- In conjunction with Glenaville/Gleason stream review ensure there is public foot access to Tarras Saddle/Adams Valley through Gleason by an easement along the 4 w.d. track.
- Ensure there is practical foot access to the upper South River along the river bed (signs will probably need to be provided).

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OFFICIAL INFORMATION ACT



LEGEND

-  Pastoral Lease Boundary
  -  Landscape Units
  -  Significant Landscape Feature
- 1 Rivière Valley Floor
  - 2 Rivière Fraces (Upper & Lower)
  - 3 Turfops Basin
  - 4 Turfops Basin
  - 5 Round Hill Valley
  - 6 Round Hill Valley
  - 7 Spring Valley
  - 8 Spring Valley
  - 9 Mt. Patricia



Lynch's Swamp  
(Clay Hill Section)

LANDSCAPE CHARACTER TYPES  
DOUBLE HILL PASTORAL LEASE





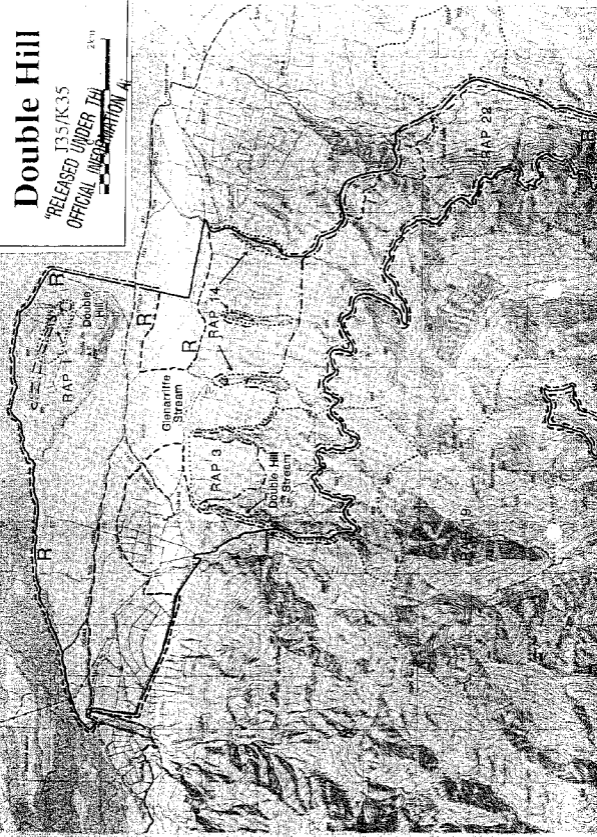
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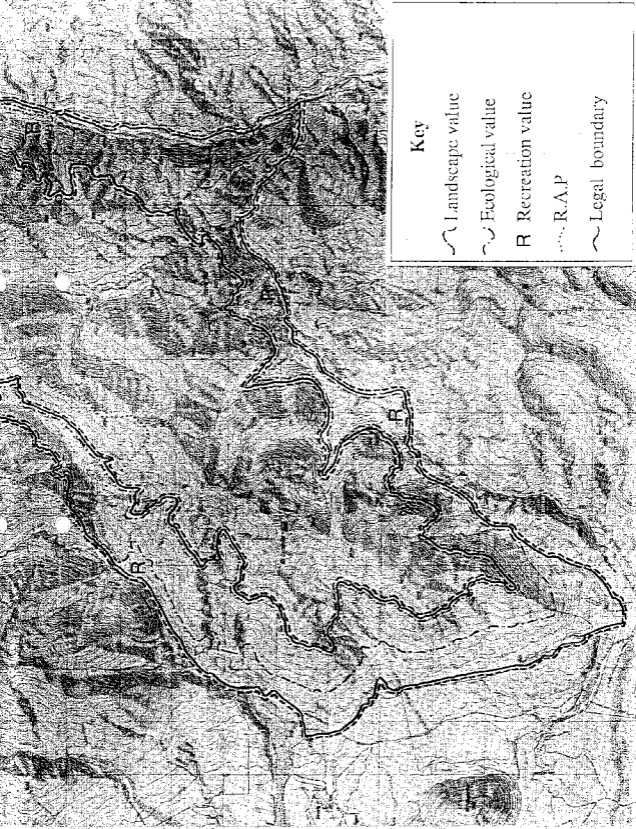
# Double Hill

J35/K35

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2411





**Key**

— Landscape value

- - - Ecological value

R Recreation value

..... R.A.P

~ Legal boundary

Recommendations

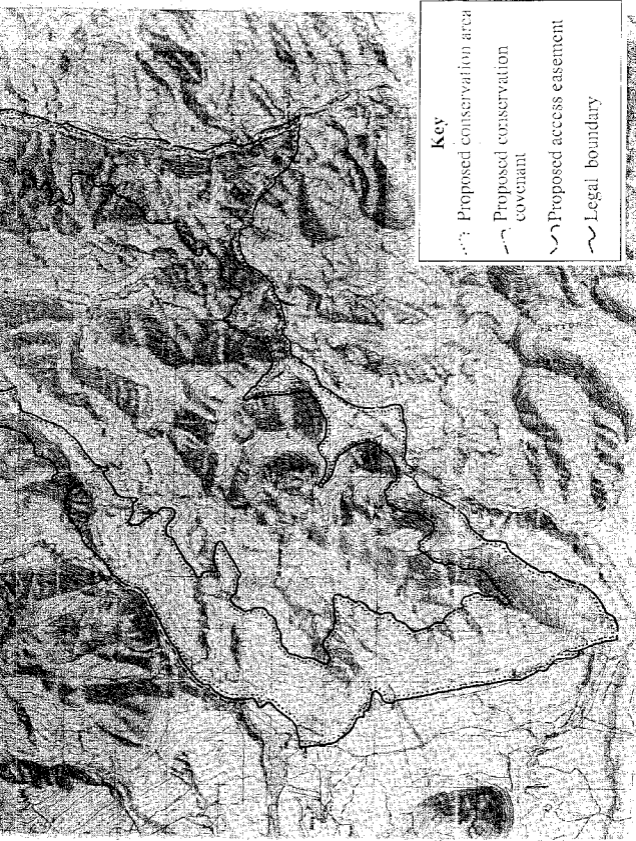
# Double Hill

"RELEASED UNDER E.O. 13526"

OFFICIAL INFORMATION ACT

2 km





**Key**

..... Proposed conservation area

———— Proposed conservation covenant

——— Proposed access easement

——— Legal boundary