



SOUTH MARLBOROUGH

SIGNIFICANT NATURAL AREAS PROJECT

A Summary of Results from an Ecological Survey
of Significant Natural Areas on Private Land in
Marlborough, South of the Wairau River



July 2005





■ ACKNOWLEDGEMENTS

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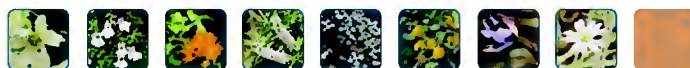
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Parts of this report have drawn heavily on the Department of Conservation Wairau Ecological Region Survey Report for the Protected Natural Areas Programme (North 2004).

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■ INTRODUCTION

This report provides an overview of the ecological survey recently carried out to identify and encourage opportunities for the conservation of natural features on private land in South Marlborough. It summarises information published by the Department of Conservation's (DoC) Protected Natural Areas report (North, M. 2004. Wairau Ecological Region – Blenheim, Grassmere, Flaxbourne, Wither Hills and Hillersden Ecological Districts. Survey report for the Protected Natural Areas Programme. Occasional Publication No. 60. Department of Conservation, Nelson.), and ecological information collected by the Marlborough District Council (MDC), in conjunction with landowners in the district, through its work identifying significant natural areas under the Resource Management Act.

The ecology of South Marlborough has previously received little attention. There were few formally protected areas, and there was a perception that little of conservation value remained.

The MDC has worked on the principle of a partnership approach with landowners to achieve improvements in the protection of remaining significant natural areas in the region. This approach has allowed for meaningful and detailed field-based surveys to be carried out in cooperation with landowners, rather than a desk-top type approach using maps and aerial photography. It has also provided both landowners and the Council, with opportunities to learn about the existing ecological values and issues that need to be understood, to enable effective protection of the more vulnerable of these areas.

A programme providing advice and financial assistance to landowners has been established by the Council. Support from central government through the "Biodiversity Fund" has boosted the MDC initiatives, as has the building of a strong relationship with the QEII National Trust, which also assists landowners to protect areas of private property through covenanting.

Through the combination of these measures, a number of protection projects have been implemented by landowners. The Council intends to continue to promote this protection work in the long term.

■ THE SURVEY AREA – ECOLOGICAL DISTRICTS

For the purposes of this report, South Marlborough is defined as that part of the MDC territorial area which lies to the south of the Wairau River (apart from the Rarangi area in the north-eastern corner which is north of the Wairau River and is included in the survey area). While ecological survey work is continuing in the northern part of Marlborough (ie, north of the Wairau River and including the Marlborough Sounds), the results of that work are not included in this overview.

The geographical units of Ecological Districts have been used as the basis for this survey (McEwen, 1987). These were developed in the 1980's to provide defined areas within which natural areas of ecological significance could be identified. An Ecological District is defined as a local part of New Zealand where the topographical, geological, climatic, soil and biological features, including the broad cultural pattern, produce a characteristic landscape and range of biological communities. The MDC territorial boundary and all of the ecological districts within it, are shown on Map 1.

The majority of privately owned land in eight ecological districts in South Marlborough, has been surveyed, subject to landowner permission. These include the Kekerengu (northern portion), Medway, Waihopai, Hillersden, Blenheim, Wither Hills, Grassmere and Flaxbourne Ecological Districts (see Map 2).

For each of the eight ecological districts surveyed the following information is given:

- **OVERVIEW**

A description of the biogeography and history of the district.

- **SURVEY RESULTS**

A table showing the number of sites identified and total area of sites by ecosystem type. The data presented in tabulated form is a simplification, as sites frequently have more than one ecosystem type present.



- **ECOSYSTEMS FOUND**

Description of the main indigenous ecosystem types present.

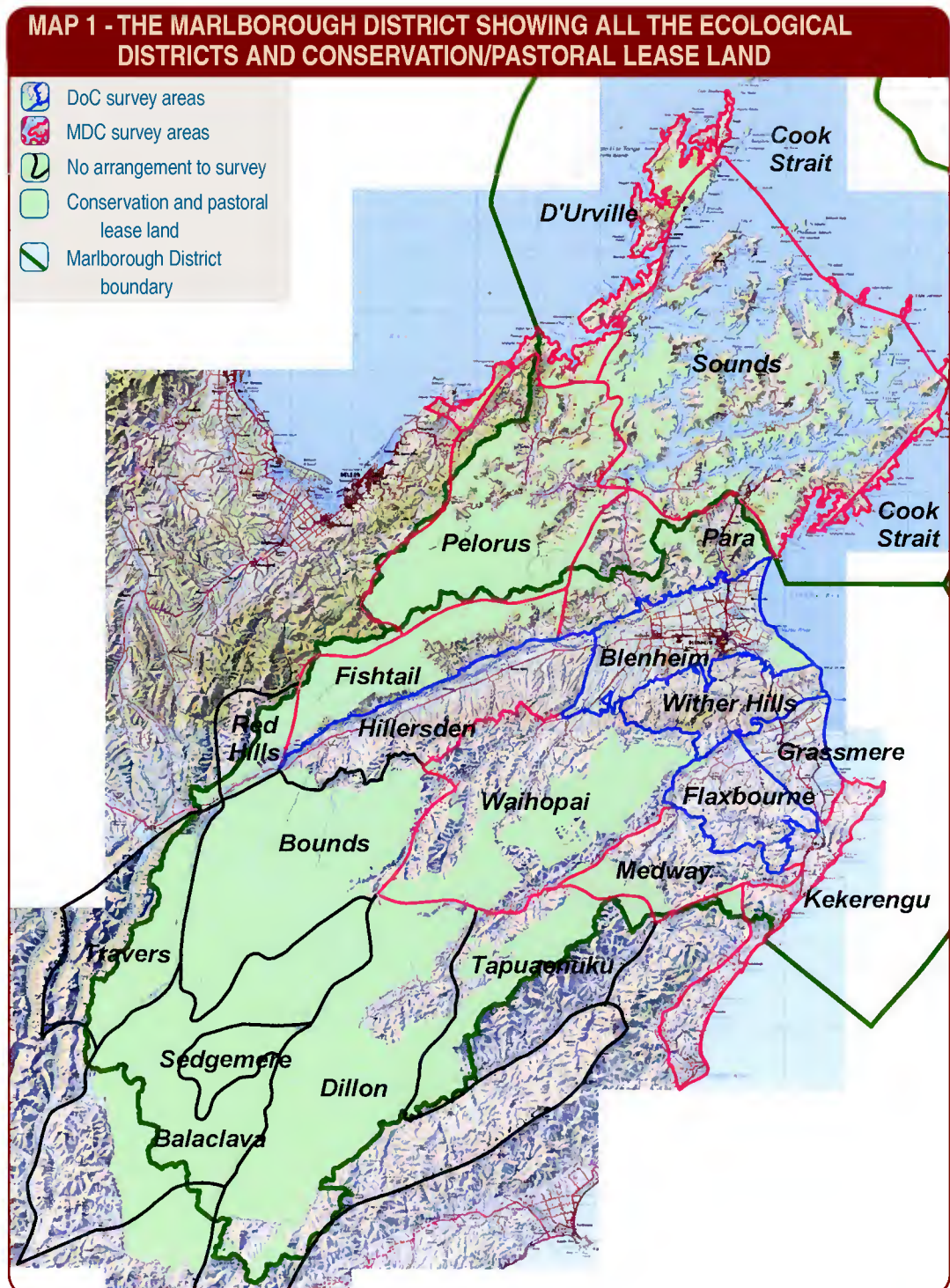
- **SPECIAL FEATURES**

Rare and threatened flora and fauna, distribution limits, anomalies, etc.

- **PHOTO ESSAY**

A series of photos illustrating typical and distinctive habitats and plants.

Those South Marlborough ecological districts that predominantly include the Molesworth Station, pastoral lease properties and land managed by the Department of Conservation, have not been included in this survey (Tapuaenuku, Dillon, Balaclava, Sedgemere, Bounds and Travers ecological districts – see Map 1).



THE FIELD SURVEY - METHOD

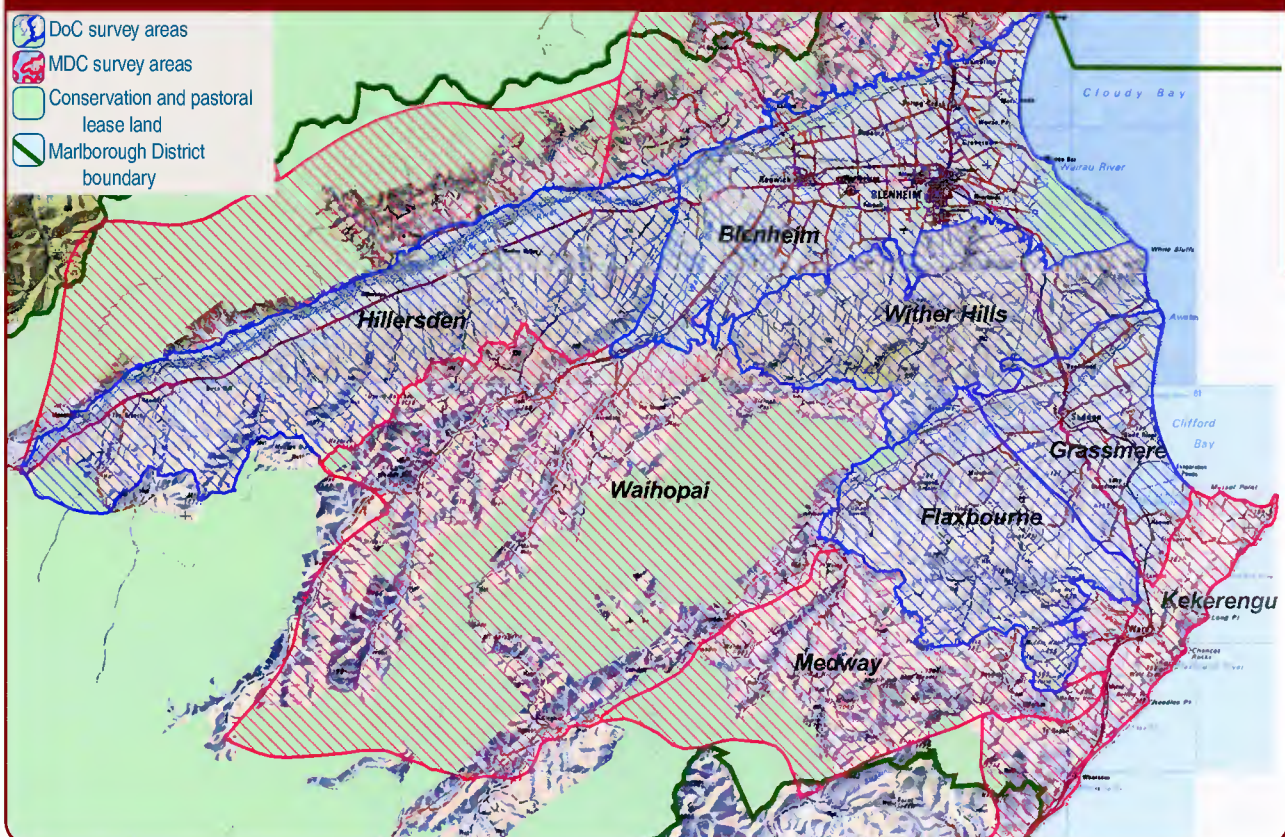
Prior to the field surveys getting underway in 2001, preliminary consultation with landowners and relevant agencies took place. A working group was established by the Council to help manage the project, including landowner representatives, as well as MDC and DoC representatives.

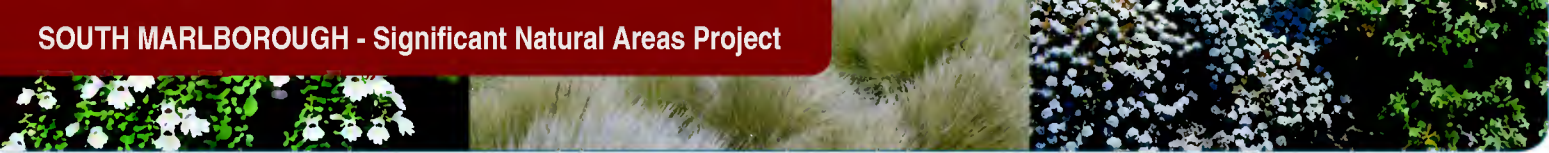
The field survey of South Marlborough took place over a three year period from 2001-2003. It was carried out by both the DoC and the MDC, reported in slightly different but complementary ways.

The DoC undertook a systematic ecological survey of the five dry lowland ecological districts within the Wairau Ecological Region: Blenheim, Wither Hills, Grassmere, Flaxbourne and Hillersden (blue shaded area on Map 2). This was to a formula developed for the Protected Natural Areas Programme, a national survey programme begun in the 1980s. The survey was overseen by Simon Moore (DoC Nelson) and led in the field by Mike North. Individual landowners were approached for access permission, but the survey was not reported on property-by-property. The resulting comprehensive collation of information has been published as a single large stand-alone document (North, M. 2004. Wairau Ecological Region – Blenheim, Grassmere, Flaxbourne, Wither Hills and Hillersden Ecological Districts. Survey report for the Protected Natural Areas Programme. Occasional Publication No. 60. DoC, Nelson).

Over the same period of time, the MDC employed a contract team of three to survey three further ecological districts - Kekerengu, Medway and the Waihopai, (red shaded area on Map 2) - under the supervision of land resources manager Nicky Eade. Following an introductory letter from MDC, local environmental consultant Paul Millen made phone contact with individual landowners and then set up the programme for the field survey. Ecologists Philip Simpson and Geoff Walls carried out the surveys, property-by-property. Each landowner received an individual report for their property.

MAP 2 - SOUTH MARLBOROUGH ECOLOGICAL DISTRICTS INCLUDED IN THIS REPORT SHOWING MARLBOROUGH DISTRICT COUNCIL AND DEPARTMENT OF CONSERVATION SURVEY AREAS





The criteria used to identify and assess sites of ecological significance by the DoC and the MDC are similar, although there are some slight differences. Both sets of criteria are set out in Appendix One.

Landowners involved with both the MDC and DoC surveys have been subsequently contacted to see whether they could be interested in following up any management suggestions made in the reports. A steady stream of protection initiatives is now underway, including fencing, pest control, restoration planting, management partnerships and formal covenanting through the QEII National Trust. In addition, some landowners have requested assistance with ecological management of their whole properties to merge production with the conservation of natural features, and management guidelines have been developed for this purpose.

Table 1 summarises overall results of the combined ecological survey work in South Marlborough. A total of 186 landowners were approached to participate in the survey, of which 135 chose to be involved, while 51 declined. A total of 265 sites were identified through the survey work, covering a combined area of 21, 420 hectares, and making up an average of 6.6% of the total land area. More detailed analysis under each separate ecological district provides information about the main ecosystem types identified.

TABLE 1 - OVERALL RESULTS OF MARLBOROUGH DISTRICT COUNCIL AND DEPARTMENT OF CONSERVATION ECOLOGICAL SURVEYS IN SOUTH MARLBOROUGH

Ecological Districts	No Properties Surveyed	No Properties Declined	No of Sites	Combined Area (ha)	% of total land area
Kekerengu	18	3	55	1340	4.3 %
Medway	13	3	70	4656	14.6 %
Waihopai	18	15	55	5274	5%
Blenheim	11	1	9	269	<1%
Wither Hills	18	7	13	4905	16 %
Grassmere	9	4	10	152	<1%
Flaxbourne	21	14	24	1165	4.1%
Hillersden	27	4	28	3660	7.5%
Totals	135	51	265	21420 ha	6.6% (average)

■ THE ECOLOGY OF SOUTH MARLBOROUGH

South Marlborough is a dramatic landscape. Major faultlines have split and tilted blocks of hard rock to create mountains. The land has been elevated to expose the skirt of younger, softer rocks now eroding into gentle coastal hills. Rivers have created broad plains of alluvial gravels. Earthquakes, rivers and the sea have together created bluffs, cliffs and gorges, which are a feature of the landscape. The climate is just as varied and extreme. Mountains and hills form rain shadows so that the north-east is dry and sunny. The mountains are summer-hot and winter-cold. Cook Strait adds another dimension – wind.

Together, the climate and geology have created a wide diversity of habitats, and this diversity is reflected in the character of the native vegetation. While South Marlborough includes many of the species that make up the mixed forests (beeches, podocarps and broadleaved trees), shrublands (including “grey scrub”) and grasslands (silver tussock and snow tussock) widespread throughout New Zealand, it also has special features.

By virtue of its central location in terms of latitude, the area has species near the southern limits of their range (particularly lowland forest species like rangiora) and some near the northern limits. The extreme dryness means that plants adapted to those conditions are prevalent. Interwoven into this



is the unique endemic element, including species that have evolved in the specific dry rocky local habitats and occur nowhere else, such as the pink brooms, NZ lilac and Marlborough rock daisy. The native fauna follows this pattern too, and the combination of these factors makes South Marlborough one of the genetic diversity centres of New Zealand.

Despite the original diversity and uniqueness however, human impact on the sensitive landscape and tough climate has been particularly severe. Fire over the last 500 years has destroyed most of the forest, firstly with Maori induced fires converting it to silver tussock lands and later, with the arrival of Europeans, to pasture. Wetland areas were highly valued by Maori as rich sources of food. They remained relatively unmodified until the arrival of Europeans, when the vast majority were drained and converted to pasture (notably on the Wairau Plain).

Favourable climate, terrain and land-use, have together attracted and encouraged high populations of wild animals (such as goats and pigs) and many introduced plants which have added further pressure on the natural habitats. As a result of both habitat loss, and competition and predation from introduced animals, the primeval fauna (which would have included moa, kiwi, kakapo, bats, giant geckos and native frogs), has also largely disappeared.

However, the indigenous ecosystems and fauna that remain provide opportunities for protection and enhancement. Many landowners, perhaps because of the special characteristics of the area, including the local plants and extreme factors such as drought, often have a particularly strong bond with the land and are keen to learn more about the plants and animals and to protect them if at all possible.

■ ECOSYSTEMS OF SOUTH MARLBOROUGH

The main ecosystem types found through the ecological survey work are described. These form the basis for the survey results in Tables 2 - 9 and 11 of this report. While the focus is on ecosystems on private land, the coastal and riverbed/riparian sites generally include both public and private land, due to the existence of various types of public land strips alongside these areas (commonly known as the "Queens Chain").

Coastal sand dune and flat communities

Most dunes and flats are now dominated by exotic marram grass, but there are small remnant areas containing native sandbinders: spinifex, pingao, sand tussock and sand coprosma. The best examples occur at Marfells Beach, Mussel Point and Canterbury Gully mouth. Also present in the Cape Campbell vicinity are small populations of coastal mat daisy (*Raoulia* aff. *hookeri*), a nationally rare community.

Coastal rock and stonefield communities

Hard rock outcrops on the South Marlborough coast are uncommon. The two that stand out are at Chancet Rocks and Needles Point, where there are dramatic limestone spines on which Marlborough rock daisy and small coastal plants grow. There are several examples of stonefields at the rear of pebbly and sandy shores. These are also rare habitats, sites that have probably been exposed to the coastal elements for centuries, if not millennia, resulting in ventifacts (wind-sculpted stones). Most of the stonefields have become colonised by marram grass, with exotic iceplant also a problem in some instances, but one or two retain prostrate native plants (the daphne *Pimelea urvilleana* and mat daisies).

Rarangi beach ridge system

There is an impressive system of parallel coastal ridges and hollows behind the beach between Rarangi and Wairau Bar. These represent former positions of the coastline, left high and dry by successive earthquake uplift, and are listed as a geopreservation site. On the ridges are remnant shrublands of *Coprosma crassifolia* and porcupine shrub (*Melicactus* aff. *alpinus* "Waipapa"), and the hollows contain fragments of raupo, manuka and cabbage tree communities. Four native lizard species and a rich native invertebrate fauna have been reported as present.



Coastal wetlands

Two large coastal wetlands are key features of South Marlborough: Wairau Lagoons, famous for their history, archaeology, saltmarsh communities, wetland birds and fish, and Lake Grassmere, highly modified for commercial salt production and with only some saltmarsh habitat remaining.

Other coastal wetlands were never large or common in these dry ecological districts, and most have disappeared or been greatly modified since human arrival. A few remain though: ponds and swamps containing raupo, rushes and sedges; shore wetlands with saltmarsh ribbonwood and ephemeral ponds that have turf plants tolerant of wet and dry conditions. They are often key habitats for water birds and offer opportunities for restoration (fencing, planting, regeneration).

Inland wetlands

Natural inland wetlands were also rare in the past (apart from the large wetland area of the Wairau Plain), and are now even more so due to modification. The few remaining contain vegetation such as raupo, rushes and sedges and are drawcards for water birds. Some small wetlands associated with faults are present. In places there are native shrubs, small trees and other plants that indicate the original condition of fringing bush, shrubland, cabbage trees and harakeke (lowland flax). Several wetlands have permanently open water due to spring-fed upwellings. Very few are formally protected, but several are managed for conservation purposes and all offer opportunities for restoration. Lake Elterwater is an anomaly, being distinctive in having no substantial inlet or outlet streams, a feature that makes it highly vulnerable to completely drying out periodically.

Riverbed/Riparian communities

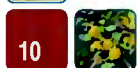
The Wairau and Awatere are the two great South Marlborough rivers, flowing along massive geological fault lines. Each has numerous tributaries. They, and the smaller Waima (Ure) and Waihopai Rivers, contribute distinctive braided riverbed habitats, made up of gravel with little vegetation. This is a key habitat for several native birds (terns, gulls, pipits, pied stilts and dotterels), several of which are nationally threatened. Threats include water and gravel extraction, woody weeds, predators and vehicles. Other riparian communities include trees, shrubs, harakeke, ferns and grasses on hard rock river and stream banks, flats and terraces. Distinctive plants such as pink brooms and fierce lancewood occur in several sites, some of which are now being managed for conservation.

Rock outcrop, scarp and cliff communities

There are rock outcrops, rocky scarps and cliffs throughout South Marlborough. These occur on hillsides, in gullies and streams and at the coast. They are habitats for distinctive vegetation and plants such as wharariki (coastal flax), "hot rock ferns" (*Cheilanthes distans* and *Pellaea calidrupium*) and various Marlborough endemics: Marlborough rock daisies (*Pachystegia* spp.), NZ lilac (*Heliohebe hulkeana*), pink brooms (*Carmichaelia* spp.), the shrub daisies *Olearia coriacea* and *Brachyglottis monroi* and local forms of the mountain daisy *Celmisia monroi*. At higher altitudes they are habitats for upland plants including small-leaved shrub daisies (*Helichrysum* spp.), "vegetable sheep" (*Raoulia* spp.) and alpine herbs. The highest Marlborough rock daisy plant yet recorded was found at 1350m on Mt Malvern. High-altitude screes host especially adapted plants such as penwiper (*Notothlaspi rosulatum*). The best examples are inaccessible to stock and require little special management.

Limestone communities

The limestone masses at Chalk Range, Isolated Hill, Weld Cone, Needles Point and Woodside Creek have special communities of shrubs, grasses and herbs that include plants found only on limestone (calcicols), for example the gentian *Gentianella* "Ward", the harebell *Wahlenbergia matthewsii* and the woollyhead *Craspedia* "Marfells". Also present are pink brooms, Marlborough rock daisy (*Pachystegia insignis*), NZ lilac and speargrasses (*Aciphylla* spp.). The distinctiveness of these areas is appreciated locally and regionally, and formal protection is being explored for some sites outside the already protected network.



Silver tussock grasslands

Silver tussock is widespread in some hill country areas. It has undoubtedly increased substantially since human arrival and in many places it is dominant enough to form tussock grasslands. Usually there are associated native shrubs (tauhinu, matagouri, small-leaved coprosmas and the coastal shrub daisy *Olearia solandri*). At higher altitudes (above about 700m), upland plants such as speargrasses, mountain daisies and cushion plants grow amongst the tussocks. Sheep farming is the predominant use and is compatible with long-term maintenance of these grasslands, with the tussocks providing stock shelter and conditions which favour pasture grasses in drought conditions.

Dry shrublands (“grey scrub”)

Dry shrublands (also known as “grey scrub”) are widespread on some country, usually accompanied by silver tussock, and have increased in area following human arrival. The dominant shrubs are tauhinu, matagouri, small-leaved coprosmas (*Coprosma propinqua* and *C. crassifolia*), pohuehue (*Muehlenbeckia complexa*) and coastal shrub daisy (*Olearia solandri*). Porcupine shrub (*Melicactus crassifolius*, *M. alpinus* and *M. aff. alpinus* “Waipapa”), manuka, kanuka and native broom (*Carmichaelia australis*) occur less often. In places there are distinctive clumps of prostrate kowhai (*Sophora prostrata*). The rare shrub *Muehlenbeckia astonii*, leafless clematis (*Clematis afoliata*) and the mistletoe *Ileostylus micranthus* occur in dry shrublands habitat. Bracken is often present and can be locally dominant. These shrublands, especially where more mature, provide favourable habitat for native lizards (skinks and geckos), invertebrates (insects, spiders, etc) and small birds such as grey warbler, fantail and silvereye. They can be compatible with pastoral farming of sheep and cattle, so long as the farming is not too intense. However, the value and uniqueness of this vegetation is not always understood. The concept of deliberate maintenance of dry shrublands, for the benefit of both indigenous biodiversity and farm production, is currently being worked towards on several properties.

Montane and subalpine shrublands

Near and above the bushline are shrublands containing a diversity of shrubs not found in the lowlands, such as inaka (*Dracophyllum* spp.), shrub daisies (*Olearia* spp. and the upland form of tauhinu), various hebes, small-leaved coprosmas and mountain wineberry (*Aristotelia fruticosa*). Associated with them are tussocks, wharariki, mountain daisies and speargrasses. They are in best condition on shaded faces that have rarely been burnt.

Beech forests

Beech forest occurred in parts of the dry lowlands of South Marlborough but has now gone from there completely and is only found in the more mountainous country. Black beech can tolerate fairly dry, lowland conditions. It occurs in the gullies south-west of a rough line from the north bank of the lower Waima River to Boundary Creek (that flows into the Wairau River at Hillersden), mostly associated with kanuka, kowhai and broad-leaved trees. Red beech occurs further inland, where it is a little cooler and wetter, and is often associated with Halls totara and black beech. Mountain beech occurs above about 600m. Silver beech occurs on inland valley flats subject to the extremes of winter cold. Substantial tracts of beech forest occur in the head of the Avon catchment, in Black Birch Stream on the Blairich Range and on the southern side of Blue Mountain Range. However, most remaining beech forest is fragmented and in total amounts to only a small proportion of what formerly existed in South Marlborough.

Broadleaved forests (coastal gullies)

Most coastal gullies in the dry zone of South Marlborough would have been occupied in the past by broadleaved forests. Only tiny pockets remain. They mostly contain ngaio, akiraho, mahoe, cabbage tree and five-finger, and include tree hebe (*Hebe parviflora*) and various ferns. They are mostly acknowledged as special and are being informally conserved. Fencing and formal protection is proceeding for some of the best remnants. In the less arid zone south of the Waima River, greater plant diversity is present, akin to the inland broadleaved forests described in the next ecosystem type. Nikau occurs in Woodside Creek, the only known plant of this species found between Tuamarina and Rakautara just north of Kaikoura.



Broadleaved forests (inland gullies & faces)

Many inland gullies and shaded faces would also have been occupied in the past by broadleaved forests. They would have been dominated by hinau, broadleaf, lancewood, mahoe, pigeonwood, kaikomako and five-finger, and may also have contained podocarps (matai and totara) and kanuka. They have been a major casualty of the quest for timber and farmland, and now only modified remnants still remain. However, in places there is strong regeneration, especially of lancewood and five-finger. Titoki occurs in some lower-altitude gullies, indicating a linkage with the Marlborough Sounds and the humid Kaikoura coast. For many of the broadleaved forest remnants to survive and regenerate long-term, fencing is necessary.

Lowland podocarp-broadleaved forests

Forests of podocarps (matai and totara, possibly also kahikatea in damp sites) and broadleaved trees would have once grown in inland fertile sheltered alluvial and colluvial sites (flats, fans and basins). They are now functionally extinct apart from one remaining area near the Waima River. The only remaining clues are tiny remnant stands or isolated individual podocarp trees in sheltered warm basins, on steep shaded faces or on alluvial flats, usually with broadleaved forest or kanuka.

Montane and subalpine podocarp-beech forests

Forests of Halls totara and mountain beech, with plants such as broadleaf and mountain lacebark (*Hoheria lyallii*) in the gullies, would have been widespread in the South Marlborough mountains. Now they are reduced to patches, such as those on the southern side of Blue Mountain Range and Isolated Hill. Elsewhere, all that remains is the odd remnant tree and fragments of burnt wood, almost invariably of Halls totara. This species is incredibly tough and has withstood fire, storm, intensive possum and goat browsing and extreme exposure in a number of places. Regeneration is only possible where fires are minimal and stock intensity is low. The comprehensive possum control currently being carried out by the Animal Health Board, is allowing a marked recovery in Halls totara canopies.

Kanuka forests

Kanuka forests were probably widespread in the past, maintained by natural fires, storm events and erosion. Most have disappeared from the lowlands, but there are examples in gullies and a lone remnant on the lower Wairau Plain. The fragility of the lowland kanuka forest is illustrated by the recent total destruction of the Wither Hills remnant by the Boxing Day fires of 2000 and the death of many of the Wairau Plains trees in recent drought, despite the fact that both sites have formal protection. Logging for commercial firewood income occurs and can impact on older remnants. Kanuka is increasingly being recognised for its value in the medicinal honey industry (it is classed as manuka for honey), and fertile young kanuka areas with reliable rainfall hold potential for earning income from carbon credits. Inland, there are reasonably extensive kanuka forests. Mostly fairly simple in composition because of the presence of stock and feral animals, they can however include associated kowhai, lancewood and other broadleaved trees, and sometimes beeches and Halls totara. The kanuka forests are good habitat for native birds, especially bellbird, robin, brown creeper, tomtit, grey warbler and fantail. The rare sedge *Carex inopinata* was found under kanuka in two sites in South Marlborough.

Manuka low forests

Forests of manuka are fairly rare in the region. They were probably never very common, due to the dryness, however, there are some interesting pockets. The northern-most coastal manuka remnant near Cape Campbell is being formally protected and conserved. It contains ground orchids and several ferns, including a single young mamaku. Another area near the lower Waima River, has a lot of emergent kowhai, and is also in the process of being protected.

Cabbage tree (ti kouka) and other treelands

Cabbage trees are found throughout South Marlborough, sometimes in stands forming treelands and frequently associated with seepages, swamps and other wetlands or former stream channels. Although iconic in Marlborough, they are taken for granted. They were far more common in the past and are diminishing yearly. Fencing to protect the best examples, especially on valley flats, would ensure their recovery and long-term survival. Good regeneration of cabbage trees is happening in several hillslope sites that have been fenced from stock. There are a few examples of other treelands in South Marlborough, including kowhai treelands in the lower Waima Valley and kanuka treelands, mostly in valley situations.

