

SUMMARY OF ECOLOGICAL SURVEY RESULTS

As outlined for each ecological district above, a variety of native ecosystems remain on private land throughout South Marlborough. Despite the high degree of past modification and loss of the original vegetation cover and native wildlife, there are still excellent opportunities for ecological protection, enhancement and restoration. Opportunities for conservation range from protecting small remnants of special plants to managing extensive tracts of land in a way that balances both conservation and production values.

Table 10 shows the number of properties surveyed in each ecological district, along with the number and total area of sites.

Overall, a good proportion of landowners voluntarily participated in the ecological surveys, although the Waihopai and Flaxbourne rates of participation were only about 55%.

265 sites were identified with a combined area of 21, 240 hectares, or approximately 6.6% of the total land area of the combined ecological districts.

TABLE 10 - SUMMARY OF ECOLOGICAL SURVEY RESULTS

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	268	<1%
Wither Hills	18	7	13	4905	16 %
Grassmere	9	4	10	152	<1%
Flaxbourne	21	14	24	1165	4.1%
Hillersden	27	4	29	3660	7.5%
Totals	135	51	265	21420 ha	6.6% (average)

Table 11 shows the main ecosystem types identified, and their distribution and extent across the eight ecological districts. The sites together contain most of the remaining high-value habitats for native fauna and flora in the lowlands and mid-altitude lands of South Marlborough.

	Kekerengu	Medway	Waihopai	Blenheim	Grassmere	Wither Hills	Flaxbourne	Hilliersden	Totals (ha)
Ecosystem Type									
Rarangi Beach system				200					200
Inland wetland	2		59	65	21		27	6	180
Coastal wetland	21				12				33
Coastal dunes	53				33				86
Coastal rock	20								20
Kanuka forest	66	1090	1370	4		3795	550	2470	9345
Manuka forest	2	17	21						40
Riverbeds/Riparian	63	746	400			3			1212
Rock, cliff, scarp	99	203	338			42	160		842
Limestone	133	613							746
Silver tussock	51	260	1069				120	470	1970
Shrublands	354	125			35	1050	216	645	2424
Beech forest		1432	1583						3015
Broadleaved (coastal)	266				20				286
Broadleaved (inland)	60	45	109		31	15	92	69	421
Podocarp	145								145
Treelands	5	2		0.2					7.2
Subalpine shrublands		123	325						448
Totals (ha)	1340	4656	5274	269.2	152	4905	1165	3660	21420.2

CHARACTERISTICS OF REMAINING ECOSYSTEMS

The sites identified by the survey extend from the coast to the inland mountains, and the ecosystems include shore communities, wetlands, riparian communities, rock outcrop and cliff communities (including distinctive limestone areas), tussock grasslands, dry shrublands, lowland forest remnants, regenerated forests and inland/upland forests.

Some ecosystem types have been severely depleted, for instance inland wetlands and podocarp and broadleaved forests. Others like kanuka forest, shrublands and silver tussock, have probably increased in area, as these species regenerate following fire-induced land clearance, replacing the original forest where pasture cover cannot be maintained.

Sites range in size from less than one to hundreds of hectares but the majority are small remnant areas. Most common are secondary gully forests and shrublands that are protected by steep slopes along a stream, or occupy shaded slopes that are less favoured for grazing. Bluffs, isolated rock outcrops and cliffs along streams and the coast, are sites where original species have survived fire and grazing.



Some of these sites are clearly under stress. Two features that are indicators of this are evident. Firstly, often a site is dominated by one species such as kanuka, akiraho or tauhinu, since only the very best adapted species (drought tolerant and unpalatable) can survive. Secondly, other species will be present but occur in very low numbers, for instance beech or totara. A single individual might survive miles from its nearest neighbour, indicating that local extinction is happening over time.

In spite of all this, owing to the complexity of the landscape there is a surprising degree of diversity and, often, whole properties have a high degree of natural character. This means that there are widespread sources for species to regenerate and the potential for survival and recovery is considerable. The more common types of vegetation are able to sustain themselves within normal farming practice by maintaining a mosaic with productive species: kanuka, manuka, tauhinu, matagouri, coprosma scrub, common native broom and coastal shrub daisy are examples.

One of the most important reasons why the South Marlborough area can maintain a good degree of diversity is the wide occurrence of places where fire, stock and wild animals cannot reach, for instance rocky outcrops, river gorges and coastal cliffs. Such places have notably greater species diversity because they have remained less disturbed for longer periods. Examples include ngaio surviving on coastal cliffs or river gorges. A small population of kawakawa, a species no longer found anywhere else in the northern Kekerengu ecological district, is found growing on a bluffy area. More significantly, the open rock habitat is the home of scattered populations of most of the local endemic Marlborough plants such as pink broom, rock daisy, NZ lilac (*Heliohebe hulkeana*) and shrub groundsel (*Brachyglottis monroi*). These are plants of great importance. Throughout the area there are a few places where larger populations occur. For instance the shrub groundsel has in most places been eradicated by goats, but there is a very good population found in a Medway gully system. This same stream is also home to the largest population of lancewood found through the survey, probably because a few adults from the original forest have been able to survive. Sometimes a relict stand of original trees is protected from fire by a boulder field composed of rocks that have fallen from bluffs above them, notably broadleaf and akiraho.

Limestone gorges and bluffs are especially important. Owing to its highly erodible character limestone can be cut to form spectacular gorges which, while sheer, can also form ledges where plants grow well. Remnants of more common species such as totara, titoki and kaikomako survive in these places, as well as a range of calcicols (species that prefer soil high in calcium). Among these are very local species like *Wahlenbergia matthewsii*. *Senecio hauwai* is a calcicol that grows only on the soft mudstone cliffs near Cape Campbell. These are examples of the importance of soil type in the flora of the area.

Because the climate of the north-east can be extremely dry, many widespread species that are common in surrounding districts, are rare. Prominent in this category are lowland forest trees and shrubs such as silver tree fern, lemonwood, rangiora and tree fuchsia. These species are not mentioned in lists of rare species on a regional basis but they add special character at a local scale. When a picture of plant distribution is built up, the existence of a single individual of an otherwise common species can make a site especially important. A kowhai on Mt Misery in the far north-east is notable, even though kowhai becomes common further inland. A cluster of black beech in Tachalls Creek inland from Ward represents the most low altitude specimens in the area. A single nikau in the lower Woodside Creek is a link between populations at Tuamarina to the north and the Kaikoura coast to the south.

The characteristic of local rarity underscores an important ecological principle that is a feature of this area: when extremes such as drought are experienced, very small habitats created by moisture, temperature or substrate become vital for maintaining species diversity. There are transitions in species composition from the coast inland and from low altitude to high altitude. These changes reflect shifts in the amount of rainfall and mean annual temperature, making almost every patch of natural habitat slightly different from the next.

■ CONSERVATION MANAGEMENT ISSUES

Understanding which habitats and species are present is the first step in securing their survival. The second step is to identify what is needed for survival both in terms of natural processes such as regeneration, and also the modification or removal of factors that threaten survival. The third step is to provide the means to achieve these changes.

Loss of natural vegetation following centuries of fire is undoubtedly the most important factor in creating the present pattern of small isolated remnants, including remnants of secondary vegetation. The removal of forest has now largely ceased, and in places where land has been retired, some very impressive patterns of regeneration are occurring.

FENCING AND STOCK

Domestic stock (sheep, cattle and deer) in general destroy native vegetation and undergrowth - particularly in forest and wetland sites - and prevent regeneration. This occurs through grazing, trampling (especially in wet areas) and opening up places for weed invasion. As older plant individuals die they cannot be replaced and species gradually become locally extinct in this way. Given the location of natural remnants within a productive farming landscape, the fencing of wetlands, gully forests and shrublands on shaded slopes, is essential if long-term survival of indigenous plant communities is the aim. Fencing is proceeding in several key sites and in many instances can provide benefits for both the farming operation and conservation. However, in situations where severe weeds such as old mans beard and wilding pines are present, continued grazing by stock is preventing proliferation of the weeds and is therefore beneficial for the time being. Occasional grazing in some sites is also beneficial for management of rank grass, particularly where the grass overtops slower growing native communities. The maintenance of silver tussock grasslands and dry shrublands is generally compatible with stock presence, except where cattle numbers are intense.

FERAL ANIMALS

Feral pigs, deer, possums, rabbits and hares are present, to varying degrees, over much of the South Marlborough area and are responsible for damage to native vegetation and prevention of regeneration. There is some control carried out on most properties, although this is very variable. Goats are more widespread, roving over large areas, and effective control would require a collaborative and coordinated control programme. In particular, targeted control of goats, possums and hares in and around important bluff and rock habitats, would be beneficial.

Mustelids (ferrets, stoats and weasels), rodents (rats and mice), feral cats and hedgehogs also occur throughout the South Marlborough area and, as in the rest of New Zealand, they are largely uncontrolled and are responsible for great damage to the small native fauna (birds, lizards and larger invertebrates).

WEEDS

Weeds pose local threats to survival in some instances.

Old mans beard is a major problem in some areas, actively smothering vegetation and providing a challenge to control given its ability to seed and spread profusely and the fairly long life of its seed in the ground. It is beyond the capacity of individual landowners to control in several places, even though biological control agents are present and are having some effect. The Council has carried out a detailed survey of its distribution and intensity and is considering options for targeted control in important sites.



On the coast, marram grass has invaded most dune systems and is a major threat to the last remnants of native sandbinding vegetation and the mat daisy populations. Local control will be necessary for these special communities to survive long into the future. Exotic iceplant (*Carpobrotus edulis*) requires localised control as it is invading the best remaining coastal stonefield ecosystem, smothering the native plants.

Wilding pines are scattered throughout most rocky areas and rough hillslopes. They are capable of growing from sea-level to 1000m altitude and with an increase of forestry as a land use are likely to be more prevalent in future. While relatively easy to control in the early stages, they have the potential to rapidly proliferate and destroy the integrity of native vegetation.

Broom is common in places and can invade bluffs preferred by many of the endemic plants. Cotoneaster, buddleia, gorse, hawthorn, barberry, willows, Himalayan honeysuckle, sweet brier and blackberry are localised but widespread weeds and require vigilance. For some of these weeds, exclusion of stock and prevention of fire and other disturbance, may be sufficient for the regeneration of native vegetation to prevail.

Insect pests can be a local problem. For instance, mealy bugs appear to be responsible for the death of cabbage trees, and scale insects of rock daisy, in some areas.

FIRE

Natural fires would have been a feature of South Marlborough in the past. They would not have been very frequent, but sufficiently so to maintain considerable areas of successional (seral) vegetation. Burning is a traditional technique for clearing silver tussock, bracken and dry shrubland on hill farms in South Marlborough. So long as it is used sparingly, is not too intense and takes place after natural seedfall, it can be compatible with the long-term maintenance of this type of native vegetation in the landscape. However, the careless use of fire can be detrimental, especially given the extremely dry conditions that can occur.

FARM DEVELOPMENT AND SUBDIVISION

Intensification of farming, changes in land-use and land subdivision are pressures within parts of the South Marlborough area. They can pose threats to remaining native vegetation and natural habitats. However, if designed with an ecological awareness and healthy biodiversity in mind, these changes can be positive for both conservation and productivity.

WATER ABSTRACTION

With intensification of lowland land-use, particularly for viticulture, the demand for water is putting great pressure on what is a very precious commodity for conservation in a naturally dry landscape. The increasing use of dams to capture and store water has potential to drown the remnant habitats in gullies and limit flows downstream. Proposals to divert the flows of rivers, for instance for power generation or irrigation, can be a serious threat to the fauna and flora that rely on the aquatic and braided gravel systems. The well-being of rare fish and birds could also be under threat. Retaining sufficient water to maintain smaller wetlands is a challenge in places.

■ CONSERVATION OPPORTUNITIES

PROTECTION

Many private landowners in South Marlborough support the concept of protection of natural values on their land. Prior to the carrying out of the ecological surveys some landowners were already protecting special sites. A number of new initiatives are now underway following the surveys. These include formal conservation covenants through the QE II National Trust, management agreements, fencing, weed control and animal pest control, usually to the benefit of farm management and productivity, as well as to farm ecology.

There are proven methods that can be applied to diminish or remove most of the existing threats to natural sites and values, although some pest and weed issues are major challenges. Some of these threats are beyond the resources of private landowners and are a matter of regional concern. These include old mans beard, wilding pines and feral possums, goats and pigs. The Council recognises this and is investigating the control of old mans beard, goats and wilding pines in some areas. It is already involved in widespread possum and ferret control along with the Animal Health Board.

Practical and financial assistance to protect areas is available to landowners from the Council through its Landowner Assistance Programme. Assistance can also be sought from other sources such as central government's Biodiversity Fund and the QEII National Trust, either independently by the landowner, or through a package organised and administered by the Council.

Potential alternatives to pastoral farming or forestry for deriving an income from the hill country, are being developed. These may be relevant to Marlborough in the future. They include earning "carbon credits" through fostering the regeneration of native forest to capture carbon dioxide from the air and sequester it in growing forests that have long-term security. This may be an option for the more fertile lowland parts of the South Marlborough area with a high rainfall, and is already underway in North Marlborough. Also at the exploration stage, are proposals for landowners to gain a financial return for measurably improving indigenous biodiversity and conserving water resources on their land (earning "biodiversity credits" and "water credits"). Meanwhile, commercial return from honey and essential oils is a genuine option for matagouri, kanuka and manuka vegetation.

RESTORATION

A number of ecosystem types are very depleted and many remaining sites are small and fragmented. Although there is a natural ability of many species to regenerate given the right circumstances, some species cannot, simply because they are too few in number, sometimes down to single individuals. In many cases the propagation and replanting of plants is needed to establish a centre from which natural regeneration is possible. Sometimes species known to have been in an area have gone and need assistance to return. Lowland totara near Cape Campbell is an example.

A landscape approach to restoration, whereby fragmentation is gradually reduced, is an important principle, building on the natural tendency for forest to regenerate along streams. Because of the high degree of endemism and the extreme climatic conditions, ideally only locally sourced plant material should be used. That way the particular characteristics of the ecological district will be retained, and the restoration is more likely to succeed, as plants should be suited to the local conditions.

There are good opportunities for ecological restoration throughout South Marlborough. These include:



- re-watering and planting around wetlands (native trees including cabbage tree and kahikatea, shrubs and harakeke);
- restoration of populations of native coastal plants such as pingao, spinifex, sand tussock, sand coprosma and mat daisy;
- restoration of populations of threatened and local plants such as shrubby tororaro (*Muehlenbeckia astonii*), fierce lancewood (*Pseudopanax ferox*), mistletoes, coastal tree broom (*Carmichaelia muritai*), weeping broom (*C. stevensonii*) and pink brooms (*C. glabrescens* and *C. carmichaeliae*);
- restoration of shrublands, forests and tussock grasslands through encouragement of regeneration;
- planting to enhance and complement bush and shrubland remnants, for instance totara and black beech; and,
- intensive local control of animal pests to encourage the return of native birds and other small fauna.

■ ECOLOGISTS' CONCLUSIONS AND RECOMMENDATIONS

The survey has shown that many private landowners in South Marlborough support the concept of protection of natural values on their land. The voluntary, supportive and non-regulatory partnership approach adopted by the MDC has resulted in the collection of a significant amount of ecological information and the promotion of the protection and sustainable management of many of these ecologically special areas. Protection methods include formal conservation covenants, management agreements, fencing, weed control and animal pest control, usually to the benefit of farm management and productivity as well as the natural values on the property.

It is recommended that the established follow-up process, through the MDC's Landowner Assistance Programme, be continued, using the ecological reports as the basis for discussing and designing effective conservation initiatives. There are proven methods for diminishing or removing most existing threats to natural sites and values given access to advice and resources. Support for private landowners in South Marlborough can be sourced through the Council, although the resources themselves may come from elsewhere. It is recommended that the Council continue to provide a 'first port of call' service to private landowners for assistance with protection and conservation management.