Chapter 8: Biodiversity

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Biodiversity

Briefly ....

Marlborough has a unique natural character with a wide range of native plants and animals that have chosen to make Marlborough their home. The very nature of this biodiversity has been shaped by geographical and climatic conditions as well as human intervention. Like the rest of New Zealand, Marlborough's natural environment has been highly modified from that which existed before human arrival less than 1,000 years ago. Much of the land, particularly lowland areas, was cleared of forest or wetland vegetation to make way for new land uses and more than 90% of wetland environments have since disappeared. Many bird species once common to most of New Zealand are now extinct in Marlborough (moa species, kiwi and kakapo). High populations of introduced animals (such as goats and pigs) and plants have added further pressure on Marlborough's natural habitats.

ISSUES

- Lack of natural areas and biodiversity in lowland south Marlborough.
- Threats to biodiversity and areas of native vegetation from stock access, feral animals browsing and predating, introduced weeds, land clearance by fire and from farm development and subdivision.
- Draining wetlands, diverting waterways, construction of dams and taking water from streams and aquifers for irrigation has affected freshwater biodiversity.
- Pressures on fisheries from recreational and commercial fishing.

PRESENT AND FUTURE MANAGEMENT

Since the 1990s central government has given the issue of the decline of New Zealand's indigenous biological diversity greater priority. The New Zealand Biodiversity Strategy was launched in 2000 to guide the work of six key government agencies, local government, and community groups, to halt the decline of New Zealand's biodiversity.

Central government released a "statement of national priorities" in 2007 for protecting rare and threatened native biodiversity on private land. These priorities are to focus conservation efforts on private land but in a way that allows for local decision making. These national priorities will significantly influence how the Council responds towards maintaining or enhancing biodiversity in Marlborough.

Significant Natural Areas Project

Through the Significant Natural Areas Project, extensive field surveys have been carried out on private land throughout large areas of Marlborough. These surveys have been carried out on a voluntary basis with a large number of property owners willingly allowing the Council access to their property to carry out ecological surveys. The information collected has provided a district wide overview of the extent and state of Marlborough's biodiversity resources as well as more detailed individual property assessments.

In south Marlborough, the extreme depletion and fragmentation of the few remaining natural sites in lowland areas, means fully functioning ecosystems are not common, as many native bush birds and insects are in low numbers. Because of the lack of habitat, and therefore fauna, functions like seed dispersal and pollination do not take place. The dry harsh climate of lowland parts of south Marlborough makes it difficult both for natural regeneration and assisted re-vegetation to occur, posing particular challenges for restoration projects.

A landowner assistance programme has been operating alongside the field survey work for the Significant Natural Areas Project since 2003. The programme is funded by the Council, central government's biodiversity fund and landowners. Since 2003, 41 projects on private land have been funded through the programme, 25 in south Marlborough and 16 in north Marlborough.

Twenty of the projects in south Marlborough have involved fencing to keep out farm stock. Ten of these same sites have also received follow up

re-vegetation planting work to boost depleted ecosystems and encourage more rapid recovery. 12 of the 25 protected sites have been covenanted through the Queen Elizabeth II National Trust by landowners, ensuring that they are permanently and legally protected.

In north Marlborough some ecosystem types such as lowland alluvial and swamp forests, inland wetlands and kohekohe forest, are quite depleted. However, there is a significant amount of native forest - both podocarp and beech dominated - remaining, generally in higher areas. Additionally, large areas of regenerating forest consisting of kanuka, manuka, tauhinu and broadleaved species are present. This is where land has been left to regenerate following earlier clearance by fire for pastoral farming. The moister climate and sheltered areas, allow for rapid regeneration in many cases.

Nine projects under the landowner assistance programme in north Marlborough have involved fencing, four have involved wilding tree control (willow and pines) and three have involved assisting landowners with existing animal pest control projects (possums). Three new covenants have been established through the programme so far. Five sites where assistance has been provided were already covenanted through the Queen Elizabeth II National Trust. (About 45% of the total land area of north Marlborough is administered by the Department of Conservation and is already formally protected.)

Publicity and publications

Publicity and promotion have been important to the Significant Natural Areas Project because the project relies heavily on voluntary input from landowners. Initially the emphasis was on raising awareness about Marlborough's biodiversity and letting landowners know how they could get involved. As time has gone on, the emphasis has shifted to showcasing many of the positive examples of landowner biodiversity protection work throughout Marlborough.

Seed collection project

The Council has been working with local plant nurseries to ensure that there are enough locally sourced native plants available in Marlborough nurseries for people wanting to restore natural areas. The Council collects and provides the seeds and the nursery propagates, grows and sells the plants.

Landcare groups

Landcare groups help in achieving sound environmental management and the Council promotes and supports these groups where it can. Since 2000 the Council has supported landcare groups to:

- Restore the beachfront area at Rarangi through removing weeds and planting locally source native species.
- Restore Grovetown Lagoon to enhance habitat for fish and bird life, and to enable gathering of food and encourage recreational uses.
- Plant and restore riparian forest on an area of land lying between Blind Creek and the stop bank near Tuamarina.

Marine biodiversity

The Department of Conservation, who are responsible for looking after marine reserves, helped Marlborough dive clubs set up the Long Island-Kokomohua Marine Reserve in Queen Charlotte Sound in April 1993 - the South Island's first. No fishing is allowed in marine reserves. The Department began monitoring in March 1992, about a year before the marine reserve was formally set up and has continued annually since. What has been observed is that blue cod are significantly larger and more abundant within the marine reserve compared to neighbouring areas. Other species such as butterfish and rock lobster are also larger and more abundant within the reserve than in areas outside the reserve.

Another response to concerns about Marlborough Sounds fisheries saw the setting up of an incorporated society called "SoundFish" in 2006. SoundFish is currently setting up a framework for a community based fisheries management plan (under the Fisheries Act 1996) for the Marlborough Sounds and is supported by the Council in this work. A priority has been to look at protecting and enhancing the blue cod fishery. The Ministry of Fisheries, has decided to close the inner waters of the Marlborough Sounds to blue cod fishing for 4 years (2008 to 2012) to allow time for stock to recover while the community makes choices about the long term management of blue cod in the Sounds.

Biodiversity

In depth ....

Biodiversity includes all life - plants, animals, fungi and micro-organisms - the genes they contain and the ecosystems (on land or in water) where they live. The Resource Management Act 1991 defines biological diversity as "the variability among living organisms, and the ecological complexes of which they are a part, including diversity within species, between species, and of ecosystems". A more diverse ecosystem is better able to withstand environmental stress and has a greater chance of adapting to environmental change. The more species that make up an ecosystem, the more resilient and stable the ecosystem is likely to be.

The biodiversity of a region not only includes the native species of plants and animals. It also encompasses all life, including humans and their many introduced species of plant crops and domestic animals. However, the focus for 2008 State of the Environment Marlborough is on Marlborough's indigenous, or native, biodiversity, natural areas and ecosystems.

Human impact has been particularly severe on Marlborough's sensitive landscapes and ecosystems. Fires started by settlers over the last 700 years have destroyed most of the forest that once covered the district. The vast majority of wetlands (notably on the Wairau Plain), highly valued by Maori as rich sources of food, have been lost when they were drained and converted to pasture by the Europeans.

The favourable climate, terrain and land-use in Marlborough have seen high populations of wild animals (such as goats and pigs) and many introduced plants become established. These introduced species have added further pressure on natural habitats. As a result of habitat loss, competition and predation from introduced animals, the original native animals have also largely disappeared. Many species that once lived in Marlborough (including moa, kiwi, kakapo, bats, giant geckos and native frogs) have become locally extinct. Those that have managed to survive human impacts are often only found in isolated remnant habitats.

NATIONAL OVERVIEW

Since the 1990s central government has given the issue of the decline of New Zealand's indigenous biological diversity greater priority in order to meet international responsibilities and commitments under the Convention on Biological Diversity, which was ratified in 1993. This requires signatory countries to develop strategies and programmes to address the conservation and sustainable use of biodiversity. The 1997 National State of Environment Report identified the decline of New Zealand's indigenous biodiversity as our "most pervasive environmental issue".

The New Zealand Biodiversity Strategy was launched in 2000 to guide the work of six key government agencies, local government, and community groups, in order to halt the decline in New Zealand's biodiversity. A five year funding package of $187 million was also announced at the time and included the creation of a Biodiversity Fund specifically available for protection work on private land.

Following on from this, a Ministerial Advisory Committee was appointed to consider the best way to sustain indigenous biodiversity, which is affected by the way private land is used. The Committee's recommendations were that biodiversity management on private land should be managed by local government using mainly a non-regulatory approach.

Statement of National Priorities

A five year review of the National Biodiversity Strategy was completed in 2006. An outcome from this review was the release by central government in April 2007, of a "statement of national priorities" for protecting rare and threatened native biodiversity on private land. These priorities are to focus conservation efforts on private land but in a way that provides flexibility for local decision making. The national priorities are shown in Figure 8.1. More information about these priorities and the reasons central government has established them can be found on www.biodiversity.govt.nz/land/guidance/.

These priorities have a significant influence on how the Council will respond towards maintaining or enhancing biodiversity in Marlborough. A large area of lowland and coastal south Marlborough falls under Priority 1, and a number of specific areas will fall into Priority's 2 and 3 (for instance wetlands, the stony beach ridges at Rarangi and coastal limestone cliffs).

Marlborough has an area of 12,363 hectares of remaining indigenous vegetation in Priority 1 land environments that is not formally protected.

The yellow shading identifies land environments with 20% or less remaining indigenous vegetation under the Land Environments of New Zealand classification. The green shading is the areas of indigenous vegetation. Formally protected areas of remaining indigenous vegetation are shown in blue.

FIGURE 8.1: STATEMENT OF NATIONAL PRIORITIES FOR PROTECTING RARE AND THREATENED INDIGENOUS BIODIVERSITY ON PRIVATE LAND

National Priority 1:

To protect indigenous vegetation associated with land environments that have 20% or less remaining in indigenous cover.

National Priority 2:

To protect indigenous vegetation associated with sand dunes and wetlands; ecosystem types that have become uncommon due to human activity.

National Priority 3:

To protect indigenous vegetation associated with 'originally rare' terrestrial ecosystem types not already covered by priorities 1 and 2.

National Priority 4:

To protect habitats of acutely and chronically threatened indigenous species.

PRESSURES ON MARLBOROUGH'S BIODIVERSITY

Land areas

Some of the most significant pressures on Marlborough's biodiversity occur in south Marlborough. In this area burning has been a traditional technique for clearing silver tussock, bracken and dry shrubland on hill farms and is still used today, although much less so than in the past. The dry climate and rolling hills meant that the fires were very effective in clearing vegetation to allow pasture development. Centuries of fire has resulted in only small isolated remnants of natural vegetation remaining, especially in lowland areas. Further intensive clearance of shrub and tussock, and draining of wetlands to provide productive agricultural land also cleared native vegetation. Today very few original areas of native forest remain in south Marlborough - most areas of native vegetation is secondary growth that has regenerated after the earlier fires.

Intensification of farming, changes in land-use and land subdivision, are pressures within parts of Marlborough which pose threats to remaining native vegetation and natural habitats.

Domestic stock (sheep, cattle and deer), can destroy native vegetation and undergrowth and prevent regeneration particularly in forest and wetland sites. This occurs through grazing, trampling (especially in wet areas) and opening up places which allows weed invasion. If regeneration cannot take place older individual plants that die cannot be replaced and species gradually become locally extinct. Given that the location of many of the last natural remnants in south Marlborough are within a productive farming landscape, the fencing of wetlands, gully forests and shrublands, is essential to the long-term survival of some indigenous plant communities.

A high number of introduced feral animal species have successfully established in New Zealand since human arrival. These feral animals have serious impacts by consuming native vegetation or predating on native birds, lizards and insects. Pigs, deer, goats and possums are the main grazers. Mustelids (ferrets, stoats and weasels), rodents (rats and mice), cats and to some extent, possums are the main predators. All of these species are widespread and numerous in Marlborough although several islands in the Marlborough Sounds are free of possums (d'Urville and Arapawa).

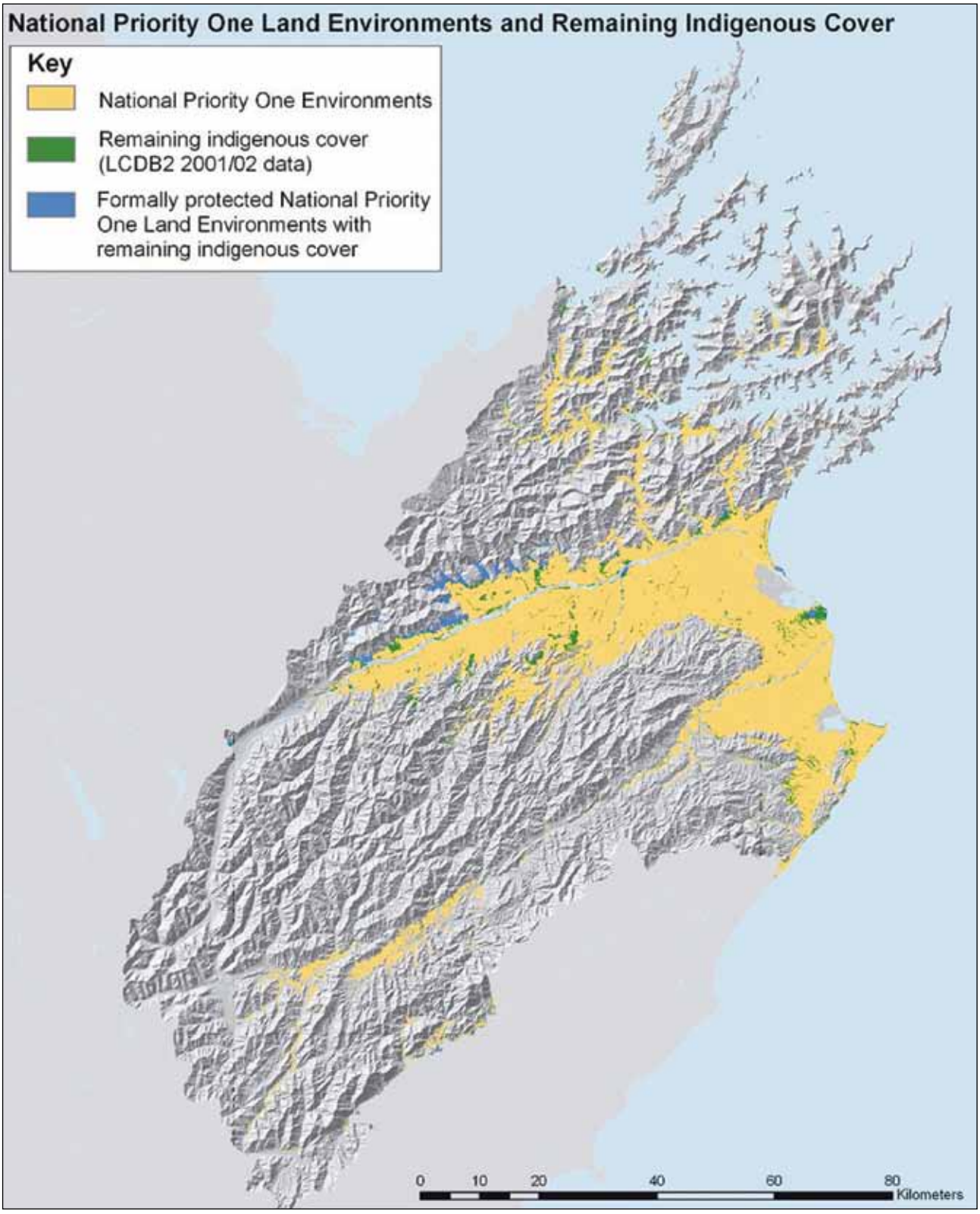
Because of its central location and favourable climate and terrain, Marlborough also has its fair share of weed species. Some of these impact on natural values and biodiversity and pose a serious threat to the survival of native plant species. Weeds can invade and displace native species, particularly in open habitats where light conditions often allow them to quickly out-compete less vigorous or large native species - see box 'Old Man's Beard'. The edges of forest and shrubland areas, regenerating hillsides, river beds and wetland and coastal sites, are also quite vulnerable to the impact of invasive weeds.

Wilding tree species (pinus radiata, pinus contorta, sycamore etc), are also a serious threat in some parts of both south Marlborough, and the extensive areas of regenerating hill slopes of the Marlborough Sounds. They grow in a wide variety of situations and will out compete most native vegetation in a short period of time. While relatively easy to control in the early stages, they have the potential to rapidly spread and destroy native ecosystems.

On the coast, marram grass has invaded most sand dune systems and is a major threat to the last remnants of native sandbinding vegetation and the mat daisy populations, which still exist in some areas.

Other weeds like cotoneaster, broom, buddleia, gorse, hawthorn, barberry, willows, Himalayan honeysuckle, sweet brier, banana passionfruit and blackberry are localised, yet widespread.

FIGURE 8.2: NATIONAL PRIORITY ONE LAND ENVIRONMENTS AND REMAINING INDIGENOUS COVER



Freshwater biodiversity

The systematic draining of Marlborough's wetlands over the last 150 years has had a major impact on freshwater biodiversity and aquatic ecosystems. Less than 1% of the Wairau Plain wetlands that existed before Europeans arrived in New Zealand still remain. The fish species, the giant kokopu, was once common in the wetlands and streams of the Wairau Plain. Today they are very rare with only six being positively identified on the Wairau Plain since 1974. This can be solely attributed to loss of suitable habitat.

Many of the small streams and waterways, and even the largest river in Marlborough, the Wairau River, have been straightened, diverted and channelised over the last 150 years in order to control flooding and increase agricultural production. Native riparian or riverside vegetation has been largely replaced by exotic willows and shrubs. This change in vegetation type has resulted in the loss of native fish species that rely on native invertebrates falling onto the water for food in many waterways.

With intensification of lowland land-use, particularly for viticulture, the demand for water for irrigation purposes has been huge. In the naturally dry landscape of these lowland areas, taking water from surface and groundwater sources can result in the loss of habitat because the headwaters of spring fed streams recede or because waterways dry up altogether.

The increasing use of dams to capture and store water also has the potential to have both negative and positive effects on natural areas and biodiversity. Remnant terrestrial habitats in

OLD MAN'S BEARD

Old man's beard is widespread throughout much of central New Zealand. It typically grows in forest edges, waste areas, streamsides and shelterbelts and is found throughout much of Marlborough. It was introduced into New Zealand as a garden plant (then known as 'traveller's joy') early in the 20th century. By the 1970s it had become a serious weed.

Old man's beard poses a threat to native vegetation in parts of Marlborough. It typically grows and invades the "edges" of native vegetation and competes with regenerating vegetation for light and nutrients. It spreads both vegetatively and through seeds, which travel readily by wind and water and are viable for 5 to 10 years. Movement of machinery and road metal have also been found to be significant in the movement of old man's beard to new sites.

Control options for old man's beard include physical removal and cutting, chemical and biological control and in some cases grazing by animals. Physical control is really only suitable for small infestations where scattered small plants and seedlings can be hand-pulled and larger plants grubbed out with their roots left to dry. Chemical control with herbicides is more suited for widespread infestations. Currently two bio-control agents for old man's beard (leaf miner and fungus) are present throughout Marlborough at low densities but are only having limited effect in controlling the plant's spread.

Old man's beard control can be a problem on farms, as in some situations stock are controlling the weed through grazing, while at the same time damaging native vegetation and preventing regeneration. Fencing stock out of areas needs to be coupled with an effective control programme in these cases.

A research project carried out by the Council in 2004 has identified the main distribution of old man's beard in south Marlborough. Old man's beard infestations were surveyed from vantage points on the roadside and within selected properties and the distribution mapped. While old man's beard is scattered over a wide area of south Marlborough there are many areas that are free or very nearly free of any infestations. These include much of the upper Wairau and Awatere and Waihopai Rivers and much of the land east of State Highway 1. There are however, large infestations in the lower Wairau and Medway and mid Awatere, Waihopai and Waima Rivers.

By killing native woody plants, old man's beard destroys food sources for native species including birds, lizards and insects.

Bluegill bully

gullies can be drowned and flows limited downstream. Many of New Zealand's native freshwater fish are diadromous, which means they migrate to the sea at some stage of their life cycle. Dams can act as barriers to fish movement both upstream and downstream stopping these fish reaching available habitat. With appropriate design and surrounding plantings though, dams can provide small areas of indigenous vegetation and freshwater habitat for birds, insects, shortfin eels and waterfowl.

Diverting the flows of rivers for power generation or irrigation, can be a serious threat to the fauna and flora that rely on aquatic and braided river gravel systems. However, it is not just large scale diversions that can be a serious threat. Changing small meandering streams into straight channels with sculptured sides severely reduces the areas of available habitat for instream life. This has already occurred on the Wairau Plain where many waterways have been highly modified and channelised because land has been developed for agriculture and vineyards. These straight uniform channels do not provide variability in depth, flow, cover and bed type needed for instream aquatic communities to thrive.

The aquatic plants found in Marlborough's waterways are not all weeds, although many are introduced species released into waterways through the illegal discarding of contents of unwanted aquariums. Nuisance aquatic vegetation has dramatically changed the face of the slow flowing lowland waterways. Marlborough's high sunshine hours and clear waters are ideal for the growth of these exotic species. The growth rate is so great the hydraulic efficiency of rivers and streams can be affected, resulting in water logged land.

Several native fish species have taken advantage of the additional cover these nuisance plant species provide as protection from predators such as kingfishers and herons. The nuisance plant species also provide a food source for invertebrates that are food for the fish.

Maintenance programmes to regularly remove this nuisance aquatic vegetation are in place to ensure the drainage network remains efficient. Over the last 10 years the methods for removing aquatic weed have been adapted so that there is a balance between maintaining water levels and protecting habitat values for native fish.

Marine biodiversity

With the length of Marlborough's coastline and the vast scale of the open ocean, it is hard to see how day to day activities could possibly impact on marine life and on biodiversity. In the past, many decisions on managing marine areas have been made with little knowledge of the interactions between species. The current state of fisheries, and therefore marine ecosystems, are a reflection of these decisions of the past.

For a number of years there has been ongoing community concern over the state of fish and shellfish stocks in the Marlborough Sounds and the sustainability of the recreational fisheries they support. Concern has tended to focus on the blue cod fishery, which has declined over the last 10 to 15 years. The exact cause of this decline has not been determined, but the pressures of both commercial and recreational fishing in the Sounds have had an impact. Catch bags have been reduced over the years in order to alleviate declining fish numbers. However, the number of people using the Marlborough Sounds has been steadily increasing over this time, resulting in a fishery still under stress. There has also been periodic concern over the state of other recreational fisheries.

Reflecting the pressure on various fish stocks, there has been increasing concern about the presence and appropriateness of commercial fishers operating within the Marlborough Sounds. This is illustrated by the debate about whether commercial operators should be allowed to dredge for scallops in the Sounds. This debate is somewhat wider than just shellfish stocks and their availability to recreational fishers and includes the damage that dredging does to the sea bed and associated biodiversity.

Butterfish

RESPONDING TO PRESSURES ON MARLBOROUGH'S BIODIVERSITY

One of the main ways the Council has responded to pressures on Marlborough's biodiversity over the last 10 years or so is by the work carried out through its Significant Natural Areas Project. This project has involved working with private landowners to identify important areas, and to look at practical ways to protect them. The emphasis has been on a voluntary partnership approach. This is underpinned by a programme to help landowners develop an understanding of the uniqueness of these areas and the importance of protecting and managing them.

There has also been an increasing emphasis placed on recognising and managing ecological and natural values on Council administered land. There have been significant native restoration plantings in river reserve land around the Wairau Plain and also on some specific conservation reserve projects. These include Koromiko Forest Reserve restoration, Grovetown Lagoon restoration, and the Spring Creek Kahikatea Reserve project.

There has also been an increasing emphasis to ensure that resource consent applicants look at the effects of their proposals on natural values and on the character of the landscape of the area they wish to develop. This includes considering indigenous vegetation, waterways and wetlands. Permitted activity rules in the resource management plans controlling the clearance of indigenous vegetation have been recently strengthened for parts of the Marlborough. These rules provide bottom lines to landowners and developers on the point at which a resource consent is needed to clear indigenous vegetation. The development of a dedicated compliance team within the Council is also a positive move forward as it allows for possible breaches of the rules to be followed up and investigated if necessary.

The Significant Natural Areas Project

Through the Significant Natural Areas Project extensive field surveys have been carried out on private land throughout large parts of Marlborough. While the Council has carried out most of the survey work overall, the Department of Conservation also carried out a substantial part of the survey work in south Marlborough.

A large amount of information has been collected, providing both a district scale overview of the extent and state of biodiversity resources, and a more detailed property scale assessment, which is useful for implementing practical protection measures. While the emphasis has been on vegetation and habitat values, wetlands and some waterways, have also been assessed.

WHAT IS AN ECOLOGICAL DISTRICT?

The ecological region and district framework was developed in 1981 in New Zealand and has been used extensively by the Department of Conservation since 1987 to carry out protected natural area surveys and identify recommended areas for protection over extensive parts of New Zealand. It has also been used as an assessment framework by other agencies, including some local authorities, undertaking significant natural areas surveys.

Its purpose was to provide a framework for assessing the "representativeness" of natural areas within a boundary defined by a combination of climatic, geological, topographical and biological factors. While it has some technical limitations, it is a useful tool based on easily definable geographic areas.

New Zealand is divided into 85 ecological regions and 268 ecological districts within these regions. There are a total of seven ecological region boundaries, which fall either partially or totally within Marlborough and twenty ecological districts within these. Fourteen of these twenty ecological districts have been included in the Significant Natural Areas programme.

The district scale information has been compiled into two summary documents, one for South Marlborough (published in July 2005), and one for north Marlborough (partially complete and to be published in 2009). The property scale information is used to promote changes in management to protect the natural values identified, for example, fencing to exclude farm stock and weed control.

Figure 8.3 shows, by ecological district (see box 'What is an ecological district?), the percentage of land area identified as significant through the survey work (SNA), Department of Conservation administered land and private land area also shown as a proportion of the total land area for each ecological district.

An important point is that not all private land has been surveyed. This is because the project was set up on a voluntary partnership basis and needed landowners to be willing to allow ecologists onto their land to carry out surveys. In some cases landowners did not want to take part and therefore their property was not surveyed.

FIGURE 8.3: % OF SIGNIFICANT NATURAL AREAS SITES BY ECOLOGICAL DISTRICT (JUNE 2008)

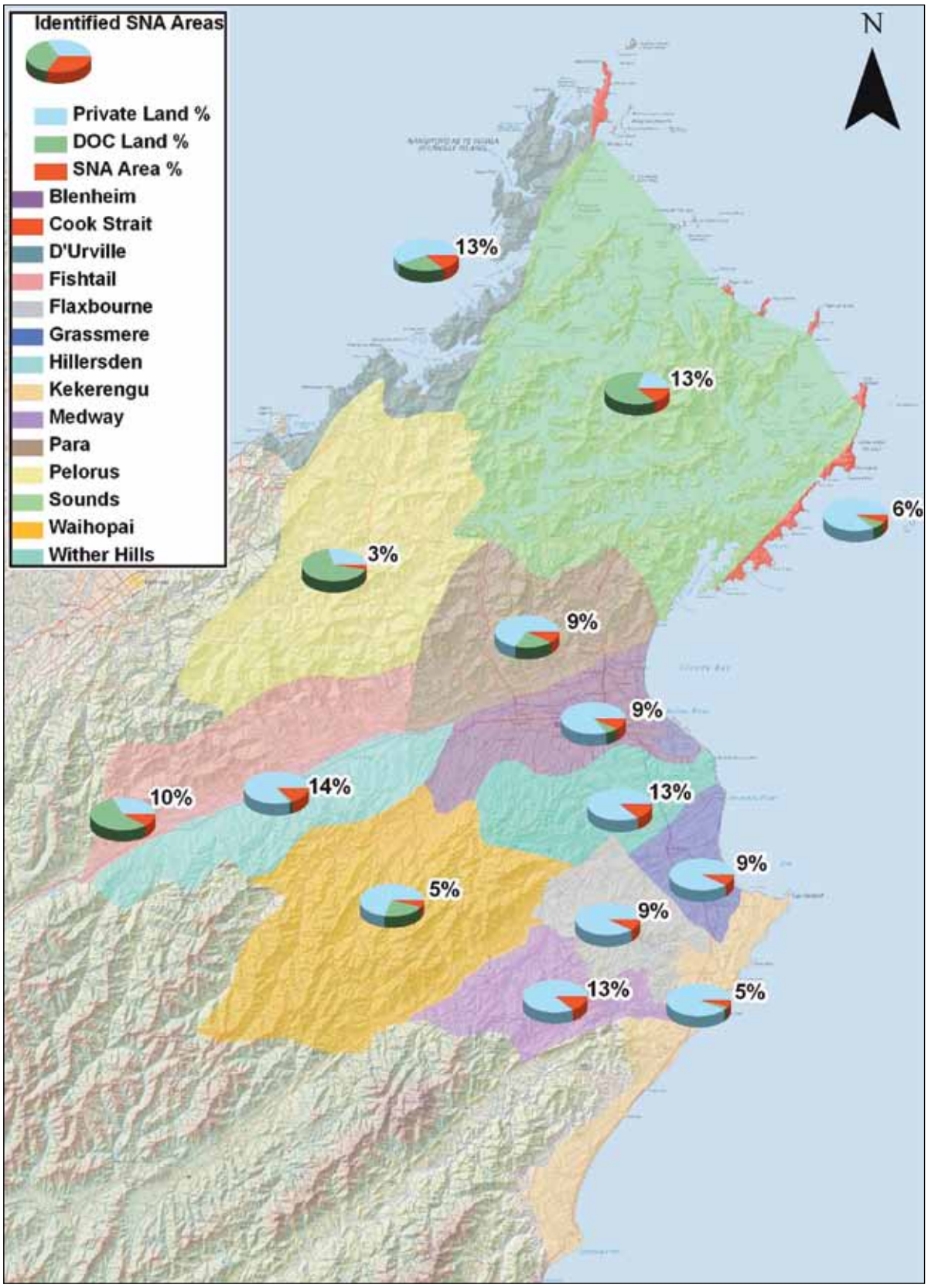


TABLE 8.1: SOUTH MARLBOROUGH - ECOSYSTEM TYPES BY ECOLOGICAL DISTRICT

Ecosystem Type	Ecological Districts (hectares)								
	Blenheim	Wither Hills	Hillersden	Flaxbourne	Grassmere	Kekerengu	Medway	Waihopai	Total
Beech forests							1432	1809	3241
Broadleaved forests (coastal and inland gullies and faces)		15	69	132	51	326	45	213	851
Cabbage Tree (ti kouka) treelands	0.5					5	2		7.5
Coastal stonefield and sand dune communities					33	73			106
Coastal wetlands	6				12	21			39
Dry shrublands (grey scrub)		700	645	377	35	354	125	1145	3381
Rock outcrop and cliff communities		50		195		99	203	338	885
Inland wetlands	82		6	33	23	2		62	208
Kanuka forests	4	3645	2470	550		66	1090	1392	9217
Limestone communities						133	613		746
Lowland podocarp-broadleaved forests						145			145
Lowland Shrublands				33					33
Manuka forests				2		2	17	23	44
Montane and Subalpine shrublands							123	325	448
Rarangi Beach System	200								200
Riparian communities		3		6.5		63	746	416	1234.5
Silver tussock grasslands		450	470	120		51	260		1351
Total	**292.5**	**4863**	**3660**	**1448.5**	**154**	**1340**	**4656**	**5723**	**22137**

Significant Natural Areas - south Marlborough

For the purposes of reporting on the Council's work through the Significant Natural Areas Project, south Marlborough is defined as consisting of that area included within eight ecological district areas - Hillersden, Blenheim, Wither Hills, Grassmere, Flaxbourne, Waihopai, Medway and Kekerengu (part).

Table 8.1 shows the extent of various key ecosystem types recorded through the significant natural area ecological field surveys in south Marlborough, within each ecological district.

In south Marlborough some ecosystem types are very depleted from their earlier extent. The little that does remain is often in poor condition and not formally protected in any way. This is obvious when looking at the total area of some ecosystem types across all ecological district: wetlands (247 hectares); lowland podocarp forests (145 hectares); lowland shrublands (33 hectares); and broadleaved forests (851 hectares).

The extreme depletion and fragmentation of the few remaining natural sites in the lowland areas, means that fully functioning ecosystems are not common, as many native bush birds and insects are in low numbers (for instance there are few tui in south Marlborough). Because of the lack of habitat, and therefore fauna, functions like seed dispersal and pollination do not take place, meaning that some sites are, or will become, unviable in the long term without active intervention by humans. The dry harsh climate of lowland parts of south Marlborough makes it difficult both for natural regeneration and assisted re-vegetation to occur, posing particular challenges for restoration projects.

Other ecosystem types are also quite few and far between but they were probably naturally rare. An example is manuka forest with only 44 hectares. This species favours moister sites and growing conditions and is far less common then kanuka in south Marlborough. In contrast, some ecosystem types like kanuka forest, shrublands and silver tussock have possibly increased in area, as these regenerate readily following fire-induced land clearance, often replacing the original forest where pasture is no longer maintained.

Current pressures identified by the ecologists undertaking the field surveys include:

- The small size and fragmentation of important sites means they will be functionally extinct in the long term without active intervention.
- There is ongoing damage by stock to natural areas (much of the survey work was carried out on pastoral farms).

The south Marlborough landscape showing dryland native plants adapted to survive in harsh conditions

- Ongoing damage and depletion from feral animals is occurring though browsing of vegetation, ground disturbance and predation on native birds, insects and lizards.
- Weeds such as marram grass in coastal areas, wilding pines and other tree species (widespread), old man's beard in some localities, broom, buddleia, cotoneaster, willows and others, are invading and competing with native plants.
- Water abstraction in lowland areas is putting pressure on remnant areas in gullies and limiting downstream flows.
- Land development and subdivision is having a negative effect where there is increased intensification and clearance of indigenous vegetation.

A Landowner Assistance Programme has been operating in conjunction with the field survey work since 2003. This has provided assistance to high value sites with identified pressures and threats that can be practically managed. Of the 41 new projects completed since 2003 under the programme, 25 are within south Marlborough. This reflects the urgency of the threats to natural values in this area and the priority given to achieving some protection to save remnant areas that would gradually degrade if there was no active management.

Of the 25 sites afforded some protection in south Marlborough, 20 have involved fencing to keep out farm stock. Ten of these same sites have also received follow up re-vegetation planting work to boost depleted ecosystems and encourage more rapid recovery. Importantly, 12 of these 25 protected sites have been covenanted through the Queen Elizabeth II National Trust by landowners, ensuring that they are permanently and legally protected. One site where weed control work has taken place

QUEEN ELIZABETH II NATIONAL TRUST IN MARLBOROUGH

The Queen Elizabeth II National Trust is an independent statutory organisation set up to help landowners to protect significant natural and cultural features on their land. Landowners voluntarily register covenants on their land through the Queen Elizabeth II National Trust process and receive ongoing advice and support from the organisation.

Nationally there are 2,791 registered covenants on private land: another 622 sites are currently going through the registration process. The registered sites cover some 100,000 hectares of land. In Marlborough there are 44 registered covenants with a further 11 sites being processed for registration. The registered sites in Marlborough cover about 2,000 hectares of land. Marlborough has the third lowest number of covenants in the country (only Nelson and the West Coast have less).

In Marlborough the covenanted areas are geographically well spread with about half in north Marlborough and half in south Marlborough. They include a range of diverse ecosystem types, including dryland environments, Sounds forests, and wetlands on the Wairau Plain. Of the 55 covenants either registered, or going through the registration process in Marlborough, about 12 have come about over the last five years by landowners involved in protecting areas through the Council's Significant Natural Areas project. Where landowners have, or plan to carry out on the ground protection work like fencing out stock and restoration planting, these areas can be permanently protected. The Queen Elizabeth II National Trust provides landowners with a legally secure way to ensure this regardless of future ownership or management of the property.

THREE NEW COVENANTS ON PEGGIOH, INLAND FROM WARD IN SOUTH MARLBOROUGH

Susan King and Barry Hope have been farming the 1,300 hectare Peggioh property, inland from Ward, for 4 years. In that time they have made a number of changes to the way the property is managed, including inviting ecologist Geoff Walls as part of the Significant Natural Areas Project to survey the property and advise them on its many and varied ecological values.

Nine significant natural areas were identified by Geoff on the property. Three of these have since been fenced from stock and covenanted through the Queen Elizabeth II National Trust. The largest of these is a 120 hectare area of kanuka forest that contains a number of noteworthy species such as prostrate kowhai, black beech, tree hebes and Marlborough rock daisy. Another substantial covenanted area of about 50 hectares is again predominantly kanuka forest but with broadleaf forest species and podocarp species beginning to emerge. The third covenant area is a geologically distinctive 9 hectare area of the property with both limestone and volcanic rock evident, along with a diverse mix of typical south Marlborough plants including rock daisy, New Zealand lilac, leafless clematis, mistletoe species and many others.

Old man's beard is present in parts of these sites and Susan has put considerable effort into control work with some funding assistance from the Biodiversity Fund and the Council. It is proving to be hard work but progress is being made with the help of a part-time contractor.

South Marlborough showing silver tussock and shrubland vegetation on the hill slopes and gullies, along with coastal habitats

had already been covenanted by the landowner. (See box 'Queen Elizabeth II National Trust in Marlborough' and 'Three New Covenants on Peggioh, inland from Ward in south Marlborough' for more information about covenanting.)

In a pastoral farming situation, fencing to exclude farm stock (and some feral animals) is often a first necessary step towards ecosystem protection. Over the 5 years since the Landowner Protection Programme has been running, 478 hectares of high value natural areas have been protected through fencing in lowland south Marlborough. In many cases further effort is needed to manage animal and plant pest issues. Ongoing monitoring is designed to detect additional threats and allow for further work to be undertaken as and when required.

Other methods to promote the protection of natural values in south Marlborough have included the pilot use of farm scale plans. These help landowners make management decisions that balance the production and conservation values within their properties, especially where fencing is not practical. The plans also encourage the collection of native plant seed material to ensure an ongoing supply of locally sourced plants for re-vegetation and restoration efforts.

A strong conservation effort on private land needs to continue in south Marlborough if functioning ecosystems are to be maintained. This is very important in the lowland areas, which have been identified nationally as threatened environments with less then 20% of natural cover remaining. This would need to include continued protection of the last remaining remnants, as well as active restoration planting to create new habitats and increase the overall area in natural cover.

Threatened species

A number of threatened plant and animal species occur in south Marlborough. Examples are native broom species and fierce lancewood, black fronted tern and New Zealand falcon. Some of these are endemic to south Marlborough, occurring only in this area. It is difficult for the Council to focus particular effort on these species while there is so much basic habitat protection and restoration to do. However, the presence of threatened plant or animal species increases the significance of a site, and therefore it becomes high priority for investment in protection and restoration.

Fauna

With a lack of habitat, parts of south Marlborough have very little native fauna (birds, insects and lizards). Most common bush bird species would have once been common, (tui, bellbird, grey warblers, South Island robin, rifleman, etc), but in many areas are now absent. In areas where forest remnants remain these birds are found, although tui distribution is quite limited. A number of lizard species are present in parts of south Marlborough. The waterways of south Marlborough vary in size and type with some of the larger permanently flowing waterways supporting good numbers of native fish and invertebrate species, while other ephemeral waterways are not so valuable for freshwater fauna.

In addition to the field surveys, where basic habitat types and fauna species observed are recorded, the Council has carried out some limited further survey work. This has been to detect and record fauna species present in particular sites and was carried out in the summers of 2007 and 2008. The methods included installing three types of lizard and insect "refuges" to detect the presence of species, and the carrying out of pitfall trapping to detect lizard presence. General observations were also made of birds and other fauna present at the time of the visits to the sites.

In the summer of 2006/2007, 94 timber tree trunk invertebrate refuges were installed at locations within eight significant natural area sites on several coastal properties around the Cape Campbell area. These were checked in January 2007, with occupancy varying from 16 to 100%. Wetas, earwigs, lacewigs, cockroach and spiders were found in the refuges. Pitfall trapping for lizards

Common Gecko

Inspecting a 'pitfall trap'

was also carried out at four of the eight sites in February 2007 and 60 captures occurred. This included 37 common skink, 22 Marlborough mini gecko and 1 spotted skink.

In 2008 a further 26 triple layer corrugated iron type ground refuges were established in 13 different significant natural area sites on three properties located in inland south Marlborough. Occupancy of these types of refuges takes some time and they will be checked regularly from summer 2009 onwards. In addition, further pitfall trapping was carried out in February 2008 at five sites on one of the inland properties. However, inexplicably, no lizards were captured although common skinks were observed in three of the five sites.

Significant Natural Areas Project - north Marlborough

For the purposes of reporting on the Council's work through the Significant Natural Areas Project, north Marlborough is defined as consisting of that area included within six ecological district areas - Fishtail, Para, Pelorus, Sounds, d'Urville and Cook Strait.

Table 8.2 shows the extent of various key ecosystem types recorded through the significant natural area ecological field surveys in north Marlborough, within each ecological district.

In north Marlborough some ecosystem types such as lowland alluvial and swamp forests (38 hectares), inland wetlands (34 hectares) and kohekohe forest (208 hectares), are quite depleted. However, there is a significant amount of native forest - both podocarp and beech dominated - remaining, generally in the higher areas. Additionally, large areas of regenerating forest consisting of kanuka, manuka, tauhinu and broadleaved species are present where land has been left to regenerate following earlier clearance by fire for pastoral farming. The moister climate and sheltered areas, allow for rapid regeneration in many cases.

A significant part of the area, about 45%, is administered by the Department of Conservation and is therefore formally protected.

North Marlborough supports a mix of land-uses including conservation (both privately owned land and Department of Conservation administered land), pastoral farming and forestry. A number of the pressures and threats are similar to those identified for south Marlborough, although the issue of extreme depletion and fragmentation is not so relevant, nor is the water abstraction issue so pressing. Feral animal pests and some plant pests (in particular wilding pines), are the main threats in many instances.

The Landowner Assistance Programme has been operating in north Marlborough since 2005 with 16 projects underway. Nine of these have included fencing, four have involved wilding tree control (willow and pines) and three have involved assisting landowners with existing animal pest control projects (possums). Three new covenants have been established through the programme so far (two Queen Elizabeth II National Trust covenants and one Privately Protected Land covenant). Five sites where assistance has been provided were already covenanted through the Queen Elizabeth II National Trust.

While fencing is important on pastoral farms, in many cases in the northern Marlborough area, animal pest control is likely to be the biggest challenge. Because of the extensive areas of suitable habitat and favourable climate, many feral animal species do very well here. Pigs and possums are very widespread, often high in numbers, while goats and deer are also present in high numbers in some places. The usual mix of smaller predators (rats, mice, stoats, ferrets and weasels, cats) are all present in varying numbers, depending on the season and specific locality. Dogs can be a problem for the ground dwelling weka.

A north Marlborough scene with regenerating vegetation on the hill slopes and coastal views

TABLE 8.2: NORTH MARLBOROUGH - ECOSYSTEM TYPES BY ECOLOGICAL DISTRICT

Ecosystem Type	Ecological Districts (hectares)						
	Cook Strait	D'Urville	Fishtail	Para	Pelorus	Sounds	Total
Alluvial valley and coastal flats forests		3			12	23.5	38.5
Beech Forests		1449	858.5	1905	1031	1159	6402.5
Bracken Fernlands/Treelands					17		17
Broadleaved forests (coastal and inland gullies)	643	355		427.5	42	877	2344.5
Coastal communities– stonefields, cliffs and dunes	29	123				176	328
Coastal wetlands/estuarine	10	88				29	127
Inland wetlands			8.5	4	13.5	8	34
Kanuka forests		638.5	153	229.5	18	4871	5910
Kohekohe forests	13	80				115.5	208.5
Lowland podocarp-beech-broadleaved forests				5	164	562	731
Lowland Shrublands (includes manuka, kanuka etc)		140.5	47.5	24	23	675	910
Montane and Subalpine shrublands		4					4
Riparian communities			6		35	9	50
Ultramafic communities		421					421
Upland podocarp-broadleaved-beech forests		223		651	112	1257.5	2243.5
Total	**695**	**3526.5**	**1073.5**	**3246**	**1467.5**	**9762.5**	**19769**

Some feral animal control is carried out on most properties, but this is highly variable. The extensive hinterland and the wide roving habits of several of the pest species, especially if they are regularly hunted, mean that continual re-invasion is an issue. Collaborative control programmes will be needed in targeted high value areas. Deliberate introduction of some recreational species like pigs, is another problem. The pest-free status of many of the islands in the Sounds is vital to their value as sanctuaries for native flora and fauna. The lack of possums on Arapawa Island, and the lack of both possums and goats on d'Urville Island also contribute much to the sanctuary quality of north Marlborough.

Plant pests are also an issue in north Marlborough with wilding trees being the most obvious. Wildings are primarily species of pinus radiata that have spread from old homestead plantings and newer commercial forestry blocks throughout the Sounds. Many individuals are actively working to remove wilding pines. The Council held a well attended public workshop on controlling wilding trees in 2006. In 2007 a Trust was established to raise funds and carry out wilding pine removal work in Queen Charlotte Sound.

Threatened Species

A number of threatened plant and animal species occur on private land in north Marlborough e.g. large-leaved milk tree, Cook Strait kowhai, weka, falcon and giant land snails). As explained for south Marlborough, where a site has species that are threatened, this does increase the significance of the site. These sites then become a higher priority for protection and restoration.

Fauna

Because north Marlborough has relatively large and intact areas of most types of habitat, fauna generally fare better here than in south Marlborough. Forest birds are relatively abundant in many areas and the waterways provide good habitat for native fish and invertebrate species. Seals and seabirds are present in good numbers around the coastal fringe. Several species of the giant land snail are present on private land, however these are severely threatened because of rats, possums and pigs. The Department of Conservation manages a number of other threatened species, including the Maud Island frog, tuatara and giant wetas on reserve land and islands.

The Council has not carried out any further specific monitoring of fauna in north Marlborough over and above that which was observed and recorded during the field surveys.

A healthy stream and luxuriant riparian vegetation in North Marlborough

Landowner Assistance Programme for protection of significant natural areas

The Landowner Assistance Programme to implement protection work was established as a pilot project in 2003. After two successful years of the pilot project, the Council made an annual amount of $100,000 available for protection work. As of 2008 the programme is into its fifth year and is well established.

A total of $485,221 has been invested in protection works with the Council Biodiversity Fund contributing approximately $143,469, the central government Biodiversity Fund contributing $172,794, and landowners contributing $131,326. In some cases where the Queen Elizabeth II National Trust is involved in covenanting the protected area, an additional financial contribution has been made ($37,632). Table 8.3 provides a summary of work completed through the Landowner Assistance Programme from 2003 through until 2008.

Giant weta

TABLE 8.3: SUMMARY OF WORK COMPLETED THROUGH THE SIGNIFICANT NATURAL AREAS PROJECT LANDOWNER ASSISTANCE PROGRAMME 2003 - 2008

Year	Work Completed
2003/2004	■ Six projects, all in south Marlborough on pastoral farms.
	■ Five projects involved fencing of areas from 2 to 145 hectares (183 in total), one project involved assisting with weed control.
	■ Three projects included a Queen Elizabeth II National Trust covenant being established.
	■ A total of $74,456 was spent (Council Biodiversity Fund $18,211, central government Biodiversity Fund $36,668, landowners $18,211 and Queen Elizabeth II National Trust contribution $1,366).
2004/2005	■ Nine projects, all in south Marlborough on pastoral farms.
	■ Six projects involving fencing of areas from 2 to 122 hectares (191 in total), three projects involved re-vegetation of sites fenced in previous year.
	■ Five projects included a Queen Elizabeth II National Trust covenant being established.
	■ A total of $91,419 was spent (Council Biodiversity Fund $14,144, central government Biodiversity Fund $39,871.00, landowners $14,144 and Queen Elizabeth II National Trust contribution $23,260).
2005/2006	■ Twelve projects, nine in south Marlborough and three in north Marlborough.
	■ All projects on pastoral farms apart from one wetland restoration project on a vineyard property.
	■ Six projects involved fencing, from 2 to 55 hectares (83 hectares in total), three projects involved re-vegetation and three projects involved weed control (wilding pines and sycamores and old man's beard).
	■ Three projects involved a Queen Elizabeth II National Trust covenant being established.
	■ A total of $102,424 was spent (Council Biodiversity Fund $30,339, central government Biodiversity Fund $34,837, landowners $32,865 and Queen Elizabeth II National Trust contribution $4,883.
2006/2007	■ Nine projects, four in south Marlborough and five in north Marlborough.
	■ Six projects on pastoral farms, one on a forestry property and two on properties managed primarily for native forest restoration.
	■ Five projects involved fencing, from 3 to 20 hectares (47 in total), three projects involved weed control and one involving habitat protection for geckos.
	■ Two new covenants were created (1 Queen Elizabeth II National Trust and one Privately Protected Land) and three other sites were already covenanted through Queen Elizabeth II National Trust.
	■ A total of $65,665 was spent (Council Biodiversity Fund $33,769, central government Biodiversity Fund $6,416, landowners $24,002 and Queen Elizabeth II National Trust contribution $1,480.
2007/2008	■ Fourteen projects, seven in south Marlborough and seven in north Marlborough.
	■ Ten projects on pastoral farms, two on lifestyle properties and two on properties managed for native forest restoration.
	■ Six involved fencing, from 2 to 100 hectares (119 in total), four involved weed control (wilding pines and old man's beard), two involved possum control projects and two involved re-vegetation projects.
	■ Two new Queen Elizabeth II National Trust covenants were created and three other sites were already covenanted through Queen Elizabeth II National Trust.
	■ A total of $151,255 was spent (Council Biodiversity Fund $47,006, central government Biodiversity Fund $55,002, landowners $42,104 and Queen Elizabeth II National Trust contribution $7,143).

TABLE 8.4: TYPES OF ECOSYSTEMS PROTECTED THROUGH THE SIGNIFICANT NATURAL AREA PROJECT'S LANDOWNER ASSISTANCE PROGRAMME 2003 - 2008

Type of ecosystem protected	South Marlborough sites	Hectares	North Marlborough sites	Hectares
Coastal	4	42		
Wetland	4	14	1	2
Shrubland	6	82	1	10
Forest	6	329	14	204
Bluffs	2	8		
Riparian vegetation	3	18		
Total	**25 (12 of these covenanted)**	**493 (478 hectares fenced)**	**16 (3 of these covenanted)**	**216 (143 hectares fenced)**

Since 2003, 41 new projects on private land have been funded through the Council's Landowner Assistance Programme. A mix of fencing, weed control and restoration planting work has been undertaken on a range of properties in both south and north Marlborough. Other more general associated work relating to the project, has included two feasibility studies looking at pest and weed control issues (for old man's beard and goat control in south Marlborough), seed collection and plant propagation (mainly totara), and associated publicity and promotion work (newsletters, a series of newspaper articles and publication of the South Marlborough Native Planting Guide). Table 8.4 describes the types of ecosystems protected through the programme from 2003 to 2008.

Funding guidelines have been developed. Generally a contribution of either 50% or 75% is available to landowners. The Council will make applications for funding to the central government Biodiversity Fund on behalf of landowners. To date the process has been relatively informal, with the Council both responding to approaches by landowners, and initiating contact with landowners, to actively encourage some protection projects on high value sites.

The Council promotes covenanting and has developed a strong relationship with the Department of Conservation and the Queen Elizabeth II National Trust, both of which provide a mechanism for landowners to independently covenant protected areas on their properties.

Monitoring of sites where protection work has taken place was started in 2006. It is intended that this will be carried out at 2-3 yearly intervals, providing a method to evaluate the success of protection actions.

Publicity and publications

Publicity and promotion have been integral to the Significant Natural Areas Project because it relies heavily on voluntary participation and proactive protection activity from landowners. Section 6(c) of the Resource Management Act requires that councils "shall recognise and provide for…..the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna". The Council has taken this role seriously.

Initially the emphasis was on increasing awareness about the unique and diverse biodiversity of Marlborough and the opportunity for landowners to take part in collecting information and looking at options for protection where necessary.

As time has gone on the emphasis has shifted to showcasing many of the positive examples of landowner biodiversity protection work throughout Marlborough. Along with a close

Preparing to plant a newly fenced wetland site on the Wairau Plain

working relationship with local media (newspaper, radio, industry magazines and newsletters and so on), publications relating to the project include:

- Annual project newsletters - 2003, 2005, 2006, 2007, 2009.
- Guidelines for landowners to develop a management plan for the sustainable management of native vegetation - 2004.
- Native Vegetation for South Marlborough - A Planting Guide - December 2004.
- South Marlborough - Significant Natural Areas Project Summary Report - July 2005.
- Marlborough District Council web page - Environment/ Ecology and Biodiversity - 2005.
- Tui to Town brochure, web page and associated planting guides (Wairau Plains and South Marlborough low lying hill country) - June 2008.
- North Marlborough - Significant Natural Areas Project Summary Report - July 2009.

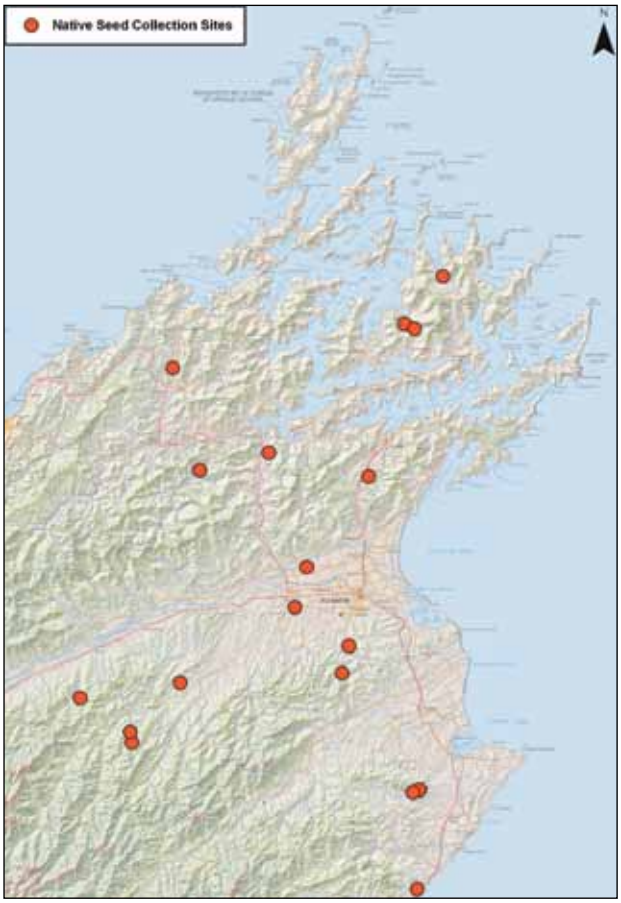
Seed collection project

Through the Significant Natural Areas Project it became apparent that boosting the supply of suitable locally sourced native plants would be necessary if there was to be an adequate volume of plant material available for restoration projects in lowland south Marlborough. Demand for plants is increasing, with many private restoration projects either protecting and restoring small remnant areas like wetlands, or starting from scratch to generate new areas from bare ground. The Tui to Town natural habitat restoration project is helping to stimulate this activity on the Wairau Plain area by providing information and for larger projects, funding assistance - see box 'Tui to Town - Natural Habitat Restoration for the Wairau Plain'.

The Significant Natural Areas Project has provided an opportunity to identify remaining pockets of indigenous plants on private land that provide valuable seed sources to generate future material for restoration planting. A pilot seed collection project was initiated in 2005 and 2006 focusing on totara seed collection. This pilot has since been extended in 2007/2008 (with the assistance of some additional funding by the central government Biodiversity Fund), to include a wider range of plants including kowhai, kanuka, flax, cabbage tree, mahoe, kohuhu, ngaio, broadleaf, lancewood and matai. Funding is available for the autumn 2009 seed collection period and ideally the programme will be ongoing to ensure that supply can meet demand.

A co-operative arrangement with local plant nurseries has been developed whereby the Council collects and provides the seeds (courtesy of the access granted by private landowners to seed sources), and the nursery propagates, grows and sells the plants. This helps to ensure that appropriate locally sourced native plants are available in Marlborough nurseries to service the restoration of natural areas in the modified lowland environments.

FIGURE 8.4: NATIVE SEED COLLECTION SITES



Large area of native vegetation - South Marlborough

TUI TO TOWN - NATURAL HABITAT RESTORATION FOR THE WAIRAU PLAIN

Rural landowners have so far been the focus of the Significant Natural Areas Project. However, the attention has now turned to the Wairau Plain area and its townships, with a focus on restoring natural habitat to bring native birds back to the area. Today the Wairau Plain is one of New Zealand's most modified landscapes, with less than 1% of the natural vegetation cover remaining. In pre human times it was covered in a mix of dryland forest, moist rainforest and flax swamplands.

A 2007 report from Landcare Research looked into the lack of native birds on the Wairau Plain. The focus was on tui; a well-known species, which would have once been common there. Now they are seen only occasionally, when drawn from forested areas of the Northbank of the Wairau River, where they live and breed, to feed on nectar producing plants such as flax, kowhai and eucalyptus species. The report stated the obvious: that for native birds like tui to re-occupy the Wairau Plain, increasing areas of habitat suitable for feeding and breeding would be essential.

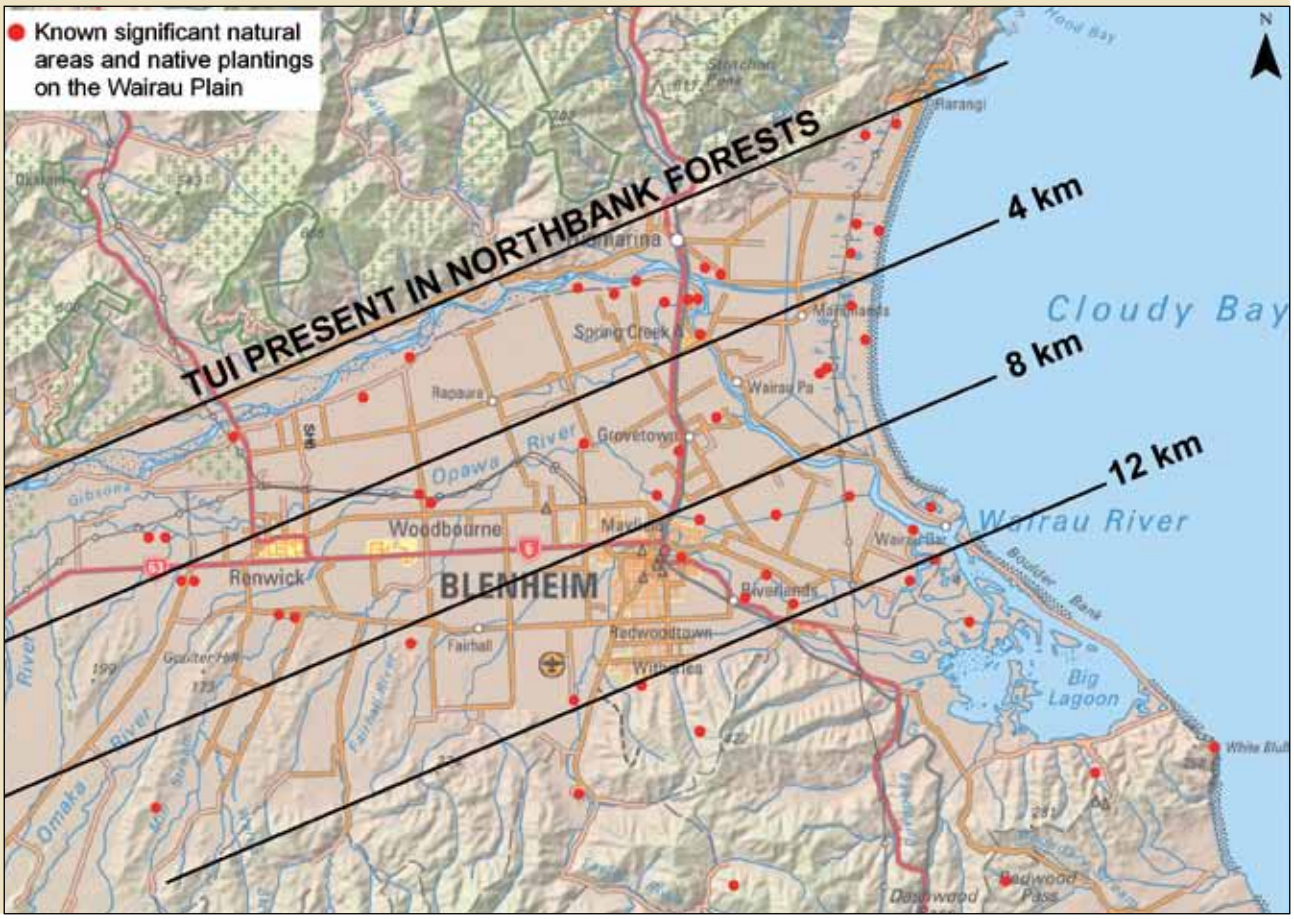
TUI TO TOWN - NATURAL HABITAT RESTORATION FOR THE WAIRAU PLAIN *continued*

The Tui to Town project, initiated by the Council, aims to entice native birds across the Wairau Plain from the Northbank forests by providing a series of "stepping stones" and "corridors" of natural habitat through restoration plantings. The vision of the project is to work together as a community to increase the area of natural habitat on public and private land by creating a minimum of 5 hectares of new habitat over the next 5 years.

The Council has set up a database to record bird sightings on the Wairau Plain. A form is available on the Council's website to enable the public to record sightings of where and when tui have been observed and also what they are feeding on. Over 2 years of receiving reported sightings from the public (2007 and 2008), it appears that tui are seen in a few favoured spots in and around Blenheim over the winter and spring months when important nectar sources are available. They are seen feeding in both native and suitable exotic trees including eucalyptus species, camellias, flax and kowhai. They are more commonly seen in areas like Rarangi, Tuamarina and properties in the Rapaura Road area where the travel distance is only 1 to 5 kilometres.

There are about 50 known sites of remnant or planted natural habitat on the Wairau Plain, however many of these are small and degraded with weeds. With continued restoration of these areas, as well as the addition of new planted habitat areas over time, the presence of native birds should increase. The Council has produced brochures with simple planting suggestions to help the community in their restoration efforts. There are also other more detailed publications available free of charge to the public. These include the "Wairau Plain Landscape Concept Guidelines 2002" and the "Native Vegetation for South Marlborough - A Planting Guide 2004".

KNOWN SIGNIFICANT NATURAL AREAS AND NATIVE PLANTINGS ON THE WAIRAU PLAIN AND DISTANCE ACROSS WAIRAU PLAIN FROM NORTHBANK FORESTS



Landcare Groups

Community landcare groups have become part of the fabric of environmental management in New Zealand. They involve groups of people with a common interest in their local environment, working together to maintain or enhance natural areas, for instance, coastal areas, waterways or areas of bush. The projects can be undertaken on both private or public land. Some groups operate very independently but most are supported by local government and other relevant government agencies like the Department of Conservation.

The Landcare Trust is a national organisation that was established in 1996 to promote and support landowner and community initiatives relating to sustainability and improved environmental management. It has regional staff available to assist groups and most local landcare groups are associated with the Trust.

The Council recognises the role of landcare groups in achieving sound environmental management in the district and promotes and supports groups where possible. Since 2000 several landcare groups have become established in Marlborough.

Rarangi Landcare Group

The Rarangi Landcare Group was established in 2000 by a group of local residents with the support of the Council, the Department of Conservation and the Landcare Trust. The main goal of the group is to promote and work towards restoration of the beachfront area. Several nationally rare species of plants and insects are present in the Rarangi area, including sand tussock (austrofestuea littoralis), scabweed (raoulia australis) and the Cloudy Bay mat daisy jumper moth (hiwaia). Over the years a number of plots along the beachfront have been cleared of weeds like lupins, garden plants, iceplant etc, which cover most of the area, and planted in appropriate locally sourced native species. Regular working bees are held to continue the work, involving residents, the Tuamarina school and Outward Bound groups. Table 8.5 shows the plantings undertaken by the Rarangi Landcare Group from 2001 through until 2008.

The Rarangi beachfront area showing newly established native plantings

Preparing for planting at Rarangi

The Grovetown Lagoon Restoration Group "Te Whanau Hou"

The Grovetown Lagoon Restoration Group "Te Whanau Hou" was set up in 2002, to promote a vision to restore the Grovetown Lagoon to enhance habitat for fish and bird life, and to enable gathering of food and encourage recreational uses. The lagoon was originally part of the Wairau River channel but now forms an oxbow lake which is largely separate from the main river.

The landcare group was initiated by local iwi Rangitane, Ngati Rarua and Ngati Toa with involvement from the wider Grovetown community, the Council and the Department of Conservation. Six years later the group is still going strong and has achieved a number of gains, including various areas of weed control and native plantings, working with the Council to improve water flow into the lagoon, which in turn should help improve water quality, and identifying recreational and educational opportunities in and around the lagoon area.

TABLE 8.5: RARANGI LANDCARE GROUP PLANTINGS 2001 TO 2008 (NUMBERS OF PLANTS)

	Sand tussock	Daphne	Tree-daisy	Tauhinu	Spinifex	Muehlenbeckia
April 2008	2544	768			240	
October 2007					42	
April 2007	236	520	176	200		
April 2006	2972	192	192			
Sept 2005	432	336				
May 2005		369				
July 2004	556					
June 2003 (est)	300	100		100		
Start 2002 (est)	100	100	100	100		100
Trial 2001 (est)	25					
	7165	**2385**	**468**	**400**	**282**	**100**

The Tuamarina/Blind Creek Landcare Group

The Tuamarina/Blind Creek Landcare Group was established in 2004 spearheaded by Margaret Peace, a well known botanist and conservation advocate. The project involves the planting and restoration of riparian forest on an area of land about 600 metres in length, lying between Blind Creek and the stop bank near Tuamarina. A group of about 12 local households are involved. The land is administered by the Council's Rivers section and the project required amending an existing lease to exclude a small area of land. Fencing of part of the area and weed removal was undertaken by the Council. The planting has been planned to be undertaken in three stages: stage one was completed in 2005; stage two in 2007; and stage three is yet to be completed. The group carries out the work through regular working bees, with help from the Tuamarina school and Outward Bound students from time to time.

The Blind Creek Landcare group planting site showing Stage One plantings in the foreground

Outward Bound students working to clear weeds at the new planting alongside Blind Creek at Tuamarina

Marine Biodiversity

Long Island - Kokomohua Marine Reserve

In 1989, members of Marlborough dive clubs voluntarily stopped taking fish around Long Island in the outer Queen Charlotte Sound in response to concerns about a drop in numbers, and in the size of fish being caught. They encouraged others to do the same, and began promoting the idea of establishing a marine reserve for the area.

Marine reserves are areas of the sea and foreshore that are protected under statute to ensure that the natural habitats of marine life are looked after. Currently there are over 30 marine reserves established in New Zealand waters with the first (Cape Rodney - Okakari Point Marine Reserve) being established back in 1975. It was one of the world's first no-take marine reserves.

Once a reserve is set up, all marine life is protected and fishing and the removal or disturbance of any living or non-living marine resource is prohibited, except where monitoring or research has been allowed. People are still allowed to go into marine reserves to dive, snorkel, take photos, swim, kayak, anchor (although with care), navigate through, picnic on the beach, build sand castles, investigate rock pools etc, however, they are not allowed to fish in these areas.

Long Island

The Department of Conservation, who are responsible for looking after marine reserves, was instrumental in helping the Marlborough dive clubs to set up the Long Island-Kokomohua Marine Reserve in Queen Charlotte Sound. The reserve was created in April 1993 - the South Island's first.

The reserve includes Long Island and Kokomohua Islands and a charted rock to the north-east. The marine reserve extends 463 metres offshore from the charted rock and from the high water mark around the islands. The reserve protects all marine life within its boundaries, benefiting not just fish and shellfish, but also animals like seals, penguins and other seabirds that live on the land but feed in the sea.

To see what the effect would be on marine life in setting up a marine reserve in this area, the Department of Conservation started monitoring in March 1992, approximately a year before the marine reserve was formally established. Monitoring has continued annually and the Department has highlighted some key results from this on its website. These include:

- Blue cod are significantly larger and more abundant within the marine reserve compared to neighbouring control sites (e.g. in 2003, blue cod were over 125% more abundant from rubble habitats within the reserve compared to similar control sites).
- Over the 10 year study, the average size of blue cod had increased in the reserve but decreased outside the reserve.
- Butterfish appear to be larger and more abundant within the reserve.
- Rock lobsters became significantly more abundant within the reserve compared to outside the reserve from April 1999 onwards.
- Rock lobsters in the reserve are significantly larger than those found at control sites (e.g. in April 2003, lobsters in the reserve were on average 30.4 millimetres larger than outside the reserve).
- Lobsters, blue cod and butterfish are noticeably less wary of humans in the reserve compared to sites outside of the reserve.

Fisheries management

In October 2002, the Council and the Nelson Marlborough Conservation Board convened a hui at Omaka Marae near Blenheim to look at options for managing fisheries at the top of the South Island. Over 100 people attended the two day hui, and very early on discussions focused on the Marlborough Sounds fisheries and the need to look more closely at protecting and enhancing that fishery. The outcome from the hui was that a fisheries management working group be formed to look at preparing and implementing a fisheries management plan for the Sounds.

The Marlborough Sounds Fisheries Management Group was established, which then became an incorporated society called "SoundFish" in 2006. SoundFish represents a number of different interests and has established a vision of "a Marlborough Sounds' fishery that is strong, diverse and accessible, and, sustains the community's needs into the future".

SoundFish is currently setting up a framework for a community based fisheries management plan (under the Fisheries Act 1996) for the Marlborough Sounds. The priority has been to look at protecting and enhancing the blue cod fishery. Several options are currently being considered including area closures, restricting the use of traditional hooks, using a system of licences or imposing stricter bag limits and size restrictions.

The Ministry of Fisheries, following this initiative, decided to close the inner waters of the Marlborough Sounds to blue cod fishing for four years. The closure came into effect on 1 October 2008 and will expire on 1 October 2012. During this time it will be illegal for recreational fishers to take blue cod caught within the enclosed waters of the Marlborough Sounds area. Fishing for other species within the Sounds will still be allowed but blue cod caught unintentionally must be returned to the water immediately.

Blue cod

The Ministry of Fisheries in closing the area considered strong measures were needed to care for the blue cod fishery because the stock is in serious trouble. There has been an average decline across Marlborough of 57% of juvenile blue cod from 2004, with the inner Queen Charlotte Sound reporting no juvenile blue cod at all. The four year time period is intended to allow time for stock to recover while the community made choices about the long term management of blue cod in the Sounds.

This will provide a window for Soundfish to further finalise its proposals for the protection and enhancement of the blue cod fishery and the valuable inshore habitat as well as finalising its fisheries management plan for the Marlborough Sounds.

[More information on SoundFish can be found at www.soundfish.org.nz.]