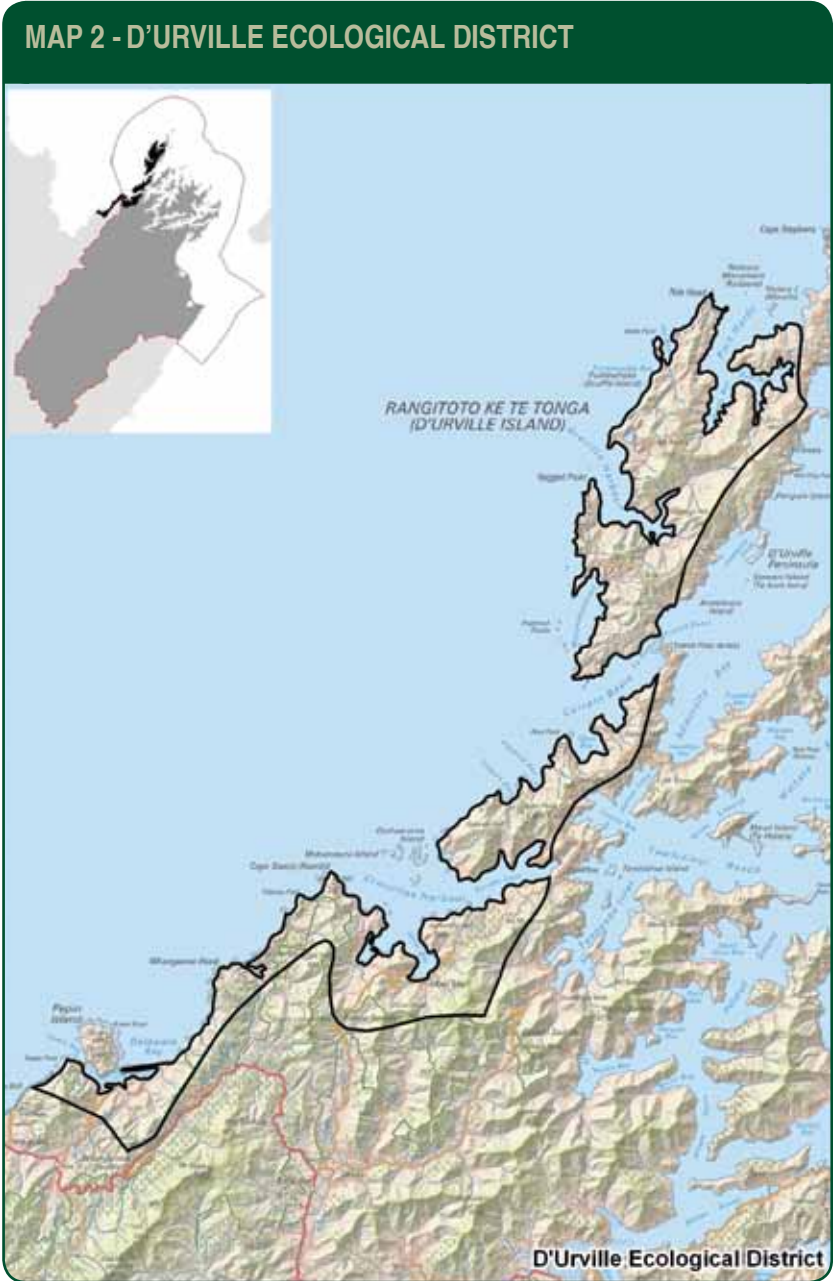


RESULTS OF ECOLOGICAL DISTRICT SURVEY WORK

D'URVILLE ECOLOGICAL DISTRICT



OVERVIEW

The D'Urville Ecological District is one of four forming the Sounds-Wellington Ecological Region. The others are Sounds, Cook Strait and Wellington. D'Urville forms the north-western district, and includes the steeplands of the eastern Tasman Bay coast from Cable Bay to the north tip of D'Urville Island. It is spectacular country exposed to the prevailing westerly weather. The topography includes wild cliff systems, headlands, steep hills, strong ridges, gullies and confined flats and inlets. There are several coastal lagoons and a series of islets and rock stacks.

The geology is complex and consists of Permian argillite, igneous conglomerate, extensive areas of ultramafic "Mineral Belt" rocks and various volcanics. These are arranged in belts or strips along a NE-SW axis. D'Urville Island has only been separated from the mainland since the last glacial period.

The climate is a maritime one, with frequent gales, reliable rainfall, warm summers and mild winters. Soils are steepland soils formed from the parent rocks and include fragmented solifluction debris. They are mostly relatively fertile but in the higher rainfall areas they are leached and have infertile podzols. In the ultramafic areas the unusual

concentrations of metallic minerals create soils that inhibit plants such as broadleaved trees and pasture grasses. Some of the soils on the Permian argillite are also difficult to grow pasture on.

The pre-human vegetation cover would have been almost entirely forest, except for eroding cliffs, beaches and water bodies. Much of the forest has been cleared for farming or timber. Hard beech is dominant in most remaining forest areas up to about 500m, with black beech on spurs, kamahi common and some rimu. In the gullies and fertile lower slopes is lush broadleaved forest containing kohekohe, pukatea, tawa and nikau. Above 500m the forest is dominated by red and silver beech. Ultramafic areas retain a little of the former forest cover of hard beech, kamahi and southern rata, but most has been burnt and now supports tight scrub of manuka, inaka (*Dracophyllum filifolium*), tauhinu and other shrubs. Areas of former forest not now in pasture or exotic pines are clad in scrub or regenerating low forest. Kanuka, manuka, tauhinu, gorse and Spanish heath are abundant in such





vegetation at an early stage in regeneration, in drier sites or where there is continued grazing. Later in the regeneration process and in gullies, the dominant plants are kanuka and/or numerous broadleaved trees such as five-finger, mahoe, karamu, heketara and putaputaweta, usually with an abundance of tree ferns. Wilding pines are the main weed threat to these areas.

The flora has features of significance such as species confined to the ultramafics and others that are only on the big sea cliffs. D'Urville Island is rather special; because it is possum-free it still has an abundance of mistletoes and also perching flora in the tall trees of the forest areas. It also supports many threatened plant species including shore milkweed (*Euphorbia glauca*), large-leaved milk tree (*Streblus banksii*) and wind grass (*Anemanthele lessoniana*).

The fauna includes most of the coastal, wetland and bush birds of the region. Threatened species include NZ falcon, marsh crake, reef heron, kereru and South Island kaka. Sadly, little spotted kiwi have disappeared in recent decades but weka are still common. Lizards (skinks and geckos) are fairly common still, and the giant land snail *Powelliphanta hochstetteri obscura* is still present. Native fish, including eels, galaxiids and bullies, occur in most streams and water bodies.

People have lived in this area for many centuries. Evidence of former Maori settlement - middens, terraces, pits and worked stone material - occur in many places. This ecological district contains the best sources of stone material for tool-making in New Zealand; there are extensive prehistoric quarries, particularly on D'Urville Island, from which material and artefacts were moved throughout the country. Some of the forest cover was burnt during the pre-European period of settlement, but most of the clearance happened since European arrival. The patterns of farming, established during the latter 19th century and early 20th century, still remain. However, they are becoming increasingly replaced by exotic forestry and coastal settlement. In a remarkable reversal of the former trend of destruction and alienation of the indigenous ecosystems, some modern landowners are returning their land to native forest and are tackling pests so that the native fauna and flora can flourish.

Weeds that pose serious ecological threats are wilding conifers (mostly pines) and old man's beard. Animal pests are feral pigs, deer, and smaller predators such as rodents, mustelids and hedgehogs, and on the mainland goats and possums as well. Wasps are also an ecological problem. Techniques for dealing with all these pests are available and with regular control it is possible to keep the threats to a minimum.

The Department of Conservation manages a network of reserves in the ecological district and there are areas of private land with protection as QEII National Trust Open Space Covenants.

SURVEY RESULTS

Of the 29 properties where the owners were approached, 20 were surveyed. A total of 46 significant sites were identified. These have a combined area of 3582 ha and make up approximately 12% of the total land area of the ecological district. They are classified into 12 basic categories or ecosystem types (see Table 2). They are mostly native forests, the most extensive being beech forests, but there are also coastal sites (including large wetlands), ultramafic communities and shrublands. Most sites have high value for ecological significance, reflecting how distinctive and special D'Urville Island and the coastal land to the south are.

ECOSYSTEMS FOUND

The original vegetation cover of the D'Urville Ecological District has been disturbed, modified and cleared since human arrival. However, much remains more or less intact and prolific natural regeneration has restored many areas, providing opportunities for protection and enhancement. Some landowners have formally protected the natural areas on their land, and are tackling weeds and animal pests. The MDC and DOC are coordinating protection work on a larger scale, such as eradication of wilding pines that occur on several properties including conservation land. The main ecosystems found were:

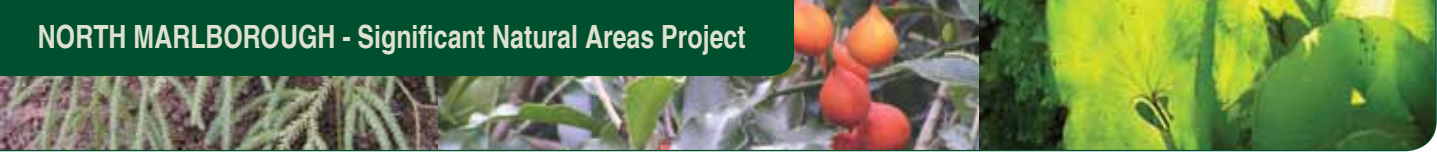


TABLE 2 - SITES IDENTIFIED IN THE D'URVILLE ECOLOGICAL DISTRICT

Ecosystem type	Total number of sites	Total area (ha)	% private land area of Ecological District	% total area of Ecological District (DoC and private)
Coastal dune and beach communities	1	7.0		
Coastal rocky scarp and cliff communities	2	141.0		
Coastal wetlands	3	88.5		
Ultramafic communities	2	421.0		
Lowland shrublands	1	58.5		
Upland shrublands	2	12.5		
Alluvial valley and coastal flats forests	1	3.0		
Kohekohe forests	12	71.5		
Other broadleaved and tree fern forests	9	386.5		
Beech forests	6	1,449.0		
Podocarp-broadleaved-beech forests	2	223.0		
Kanuka forests	5	720.5		
Total	46	3,582.0	16.5%	12%

COASTAL DUNE AND BEACH COMMUNITIES

One site only; dunes are very rare in North Marlborough.

COASTAL ROCKY SCARP AND CLIFF COMMUNITIES

Two quite large west-facing sites, homes for plant species adapted to handle extremes of exposure to sun, wind and salt.

COASTAL WETLANDS

Two coastal lagoons and a swamp. Rare ecosystems, important for native freshwater fish, invertebrates, plants and wetland birds.

ULTRAMAFIC COMMUNITIES

Highly distinctive vegetation because of the unusual chemical makeup of the parent rock.

LOWLAND SHRUBLANDS

Widespread early seral vegetation in the ecological district, the result of regeneration following forest clearance and farming.

UPLAND SHRUBLANDS

Higher altitude sites containing vegetation that has regenerated following forest clearance and farming.

ALLUVIAL VALLEY AND COASTAL FLATS FORESTS

Very rare in North Marlborough. A single small example.

KOHEKOHE FORESTS

In the South Island, only found in northern North Marlborough and at the base of Farewell Spit. Several sites in the ecological district, mostly small. Especially valuable on D'Urville Island because there are no possums.

OTHER BROADLEAVED AND TREE FERN FORESTS

Occupying lowland and coastal gullies and shaded faces. Both natural and the result of regeneration following logging. Main tree species are tawa, pukatea, mahoe and mamaku.





BEECH FORESTS

Widespread and extensive, from the coast to the tops. Four species of beech, each adapted to different conditions. Podocarps usually present.

PODOCARP-BROADLEAVED-BEECH FORESTS

Mixed forests where conditions suit a variety of tree species.

KANUKA FORESTS

Widespread in the North Marlborough lowlands, the result of prolonged regeneration following forest clearance and farming. If not unduly disturbed, provide good habitat for the regeneration of ferns and tree species that will eventually take over. Manuka is usually present and in a few places is dominant. Good for native ground orchids.

SPECIAL FEATURES

The ecological district is founded on D'Urville Island, one of the largest islands in New Zealand outside the main three, and biologically special because of its freedom from possums and feral goats. Practically the entire ecological district faces the prevailing westerly weather, so its natural ecosystems and biota are adapted to strong wind, pounding seas, salt air and rainfall deluges. There are coastal lagoons (found nowhere else in North Marlborough) and several sand beaches with dunes, homes to particular plants and animals. The most striking feature though is the ultramafic zone, with its unique influence on soil fertility, vegetation and flora.

NATIVE FLORA

- Several plants are endemic to the ultramafic zone. They include *Hebe urvilleana*, *Olearia serpentina*, an unnamed woollyhead (*Craspedia "serpentine"*) and a recently named gentian (*Gentianella stellata*). The suite of plant species in the native vegetation of the ultramafics is unusual and distinctive.
- D'Urville Island has an abundance of mistletoes: *Alepis flavida*, *Peraxilla tetrapetala*, *Tupeia antarctica*, *Ileostylus micranthus* and *Korthalsella salicornioides*. It also has threatened and regionally rare plants such as shore milkweed (*Euphorbia glauca*), large-leaved milk tree (*Streblus banksii*), fierce lancewood (*Pseudopanax ferox*), Cook Strait porcupine shrub (*Melicytus crassifolius*), *Melicytus* aff. *obovatus* and wind grass (*Anemanthele lessoniana*).
- The localised presence of swamp maire (*Syzygium maire*), pygmy pine (*Lepidothamnus laxifolius*), rewarewa (*Knightia excelsa*) and tanekaha (*Phyllocladus trichomanoides*) is interesting. They are at distribution limits and/or are anomalous.
- Kohekohe (*Dysoxylum spectabile*) dominates coastal forest in many places, imparting a subtropical ecological dimension. It is frequently accompanied by wharangi (*Melicope ternata*) and puka (*Griselinia lucida*).
- Karaka (*Corynocarpus laevigatus*), rengarenga (*Arthropodium cirratum*), harakeke (*Phormium tenax*) and whau (*Entelea arborescens*) occur in localised pockets. They are associated with past Maori settlement, particularly former garden sites. Stands of cabbage trees and occasional kowhai (*Sophora microphylla*) might also indicate former settlement sites.

NATIVE FAUNA

- Bush birds are still quite prevalent, due to the extent of bush cover and diversity of other native vegetation. The forests and shrublands support strong populations of tui, kereru, weka, bellbird, tomtit, brown creeper, silvereye, fantail and grey warbler (riroriro). Of note are the local occurrences of New Zealand robin, rifleman, kaka, kakariki and New Zealand falcon (karearea or sparrowhawk). New Zealand pipit is common in open places.



- Wetland birds have a range of remaining habitats available to them. Ducks, paradise shelduck and pukeko are quite common. Of note are local records of fernbird, marsh crake and Australasian bittern. Banded rail might still be present too.
- Coastal birds are common and include gulls, terns, shags, herons, oystercatchers, gannet and various transient waders. Of note are little blue penguin, king shag, pied shag, black shag, Caspian tern and reef heron: all are listed as nationally threatened. A recent sighting of a brown booby at D'Urville Island is of interest: this is a species of the tropics.
- Burrowing seabirds have remnant breeding colonies on the islands in Croisilles Harbour and on some western D'Urville Island islets.
- Moa bones and gizzard stones have been found in the ecological district. Remains of other extinct birds and tuatara have been found in the D'Urville Island dunes.
- Lizards (skinks and geckos) are quite common, especially in rock outcrops, screes, forest and shrubland. These habitats are also good for native invertebrates such as weta, ground beetles, moths and spiders. The giant land snail *Powelliphanta hochstetteri obscura* is still present in local populations, although severely threatened by feral pigs. Velvet worm (*Peripatus*) occurs in places.
- At least nine species of native freshwater fish have been recorded from the rivers and streams of the ecological district. Of particular note are longfin eel, giant kokopu and shortjaw kokopu.
- New Zealand fur seals are making a comeback and are frequent around the coast. Deposits of rounded pebbles in several places may indicate past populations of New Zealand sea lions; they use pebbles as ballast.



D'URVILLE ECOLOGICAL DISTRICT – PHOTO ESSAY



ULTRAMAFIC “MINERAL BELT” LANDSCAPE

Ultramafic landscape on D'Urville Island with remnant forest in the gully centre and typical low-stature regenerating vegetation foreground and background. This pattern is the result of clearance of the forest in the past using fire. Ultramafic soils have an unusual chemistry and are home to plant species that can tolerate this.



ULTRAMAFIC ROCK OUTCROPS

Rock outcrops like this occur throughout the ultramafic zone. They are often refuges for orchids, ferns, shrubs and trees that have survived burning and the depredations of feral animals. They are also attractive to New Zealand falcons as nest sites and lookouts.



MOUNTAIN CABBAGE TREE

Toii or mountain cabbage tree (*Cordyline indivisa*) is a striking feature of the upland forests. It only occurs sporadically, in sites that are reliably cool and moist due to frequent mists.

MOSAIC FOREST PATTERNS

The D'Urville ecological district has quite a few sequences of native forest from the coast to the tops. As in this Okiwi Bay sequence, the lowland forest cover has generally been cleared in the past but has been restored quite quickly by vigorous regeneration. This often results in mosaics of mature forest and youthful forests in various stages of regeneration.





INSTREAM HABITAT

D'Urville Ecological District is quite rugged and rocky and has reliable rainfall, so the many streams descend steeply and feature falls, cascades and pools. Those protected by native forest are in the best condition and provide the best quality habitat for native fish.



MARLBOROUGH PLANTS

Kiekie (*Freycinetia banksii*), a native New Zealand member of the largely tropical screwpine family that includes *Pandanus*. It climbs and scrambles up trees and around the coastal gullies and slopes of North Marlborough, often forming dense impenetrable masses. The flower bracts and fruit are edible and the leaves are prized by traditional weavers.



MARLBOROUGH PLANTS

Shore milkweed (*Euphorbia glauca*), a plant of the shore that is now nationally rare and endangered. In North Marlborough it is only found in a few sites on western D'Urville Island.

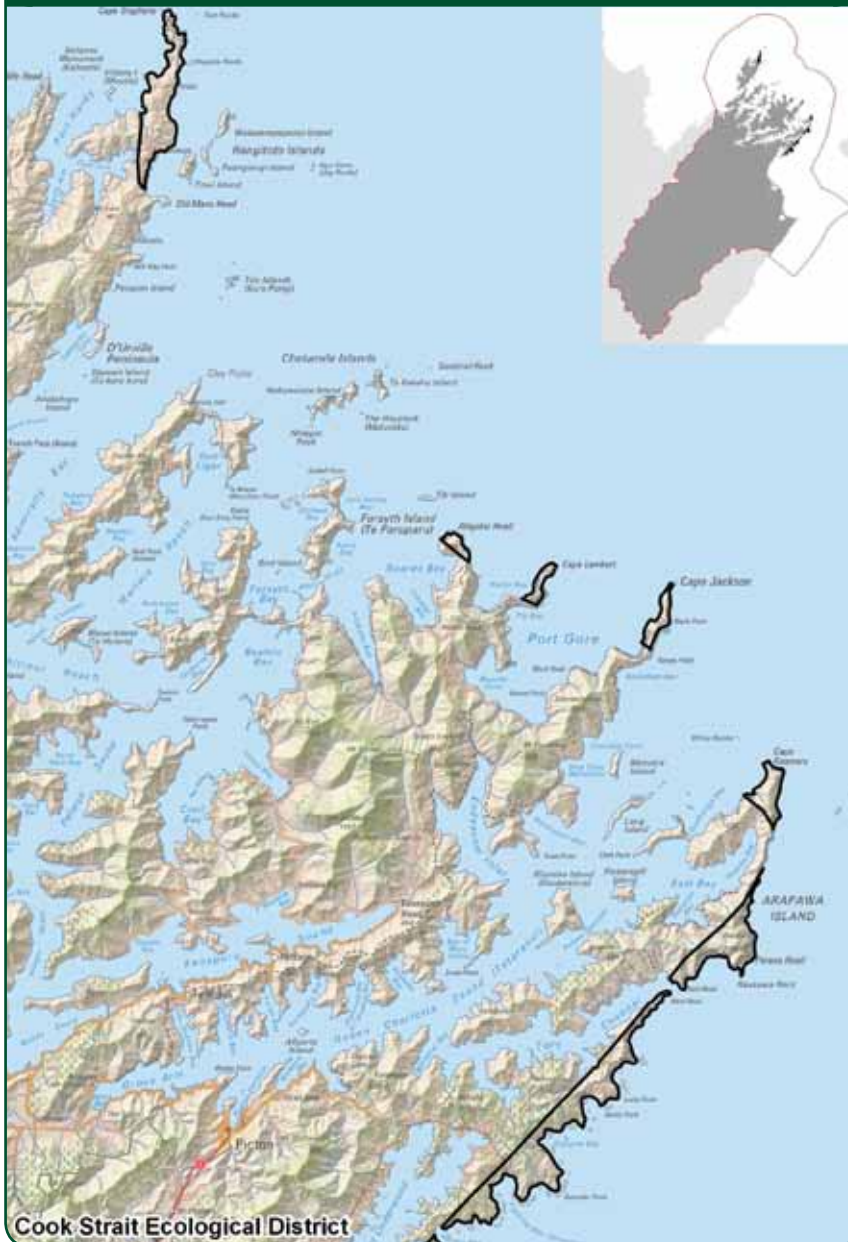
MARLBOROUGH PLANTS

Kohekohe flower in early winter, the flower spikes emerging from trunks and branches (a feature of tropical plants, giving a clue about the origins of this native species). On possum free islands (such as Awapawa, D'Urville and several other smaller islands) kohekohe canopies are healthy and profuse flowering occurs unhindered. Where possums are present, kohekohe canopies are ragged and flowers are rarely seen.



COOK STRAIT ECOLOGICAL DISTRICT

MAP 3 - COOK STRAIT ECOLOGICAL DISTRICT



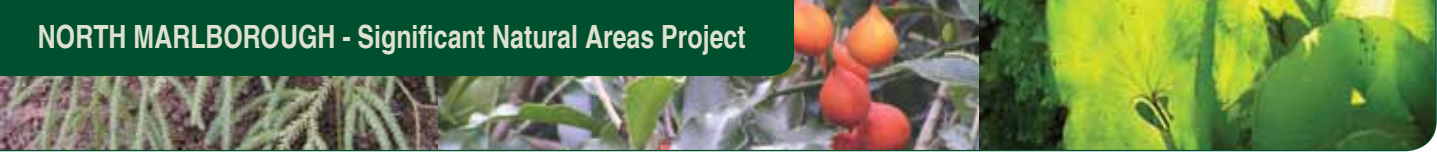
OVERVIEW

The Cook Strait Ecological District contains the exposed coastal cliffs, terraces, headlands and islands on either side of Cook Strait. On the western side (North Marlborough) it includes the outer tips of Cape Stephens, Cape Lambert, Cape Jackson and Cape Koamaru, the scarps of Arapawa Island, the coast between Tory Channel and Port Underwood, and Stephens Island (Takapourewa), the Rangitoto Islands, The Trios, the Chetwode Islands, Titi Island and The Brothers. On the eastern side it includes Kapiti Island, Mana Island and the coastal scarp between Paekakariki and Island Bay, Wellington.

The geology is complex and consists of Permian argillite, greywacke, igneous conglomerate, areas of ultramafic "Mineral Belt" rocks and various volcanics. The climate is an intensely maritime one, characterised by a high wind-run, frequent gales, reliable rainfall, warm summers and mild winters. Soils are mostly shallow and stony steepland soils, with areas of bare rock and scree.

The pre-human vegetation cover would have been almost entirely forest, except for on eroding cliffs and beaches. Most of the forest has been cleared for farming. Kohekohe

would have been dominant in most of the forests, even on exposed cliffs. In the gullies there would also have been pukatea, tawa, titoki, wharangi, kiekie and nikau. At higher levels where there is a regular cloud cap the forest would have contained a range of broadleaved species including tawa, heketara and toro, various podocarps including matai, miro and Hall's totara, southern rata (west of Cook Strait), northern rata (east of Cook Strait) and red and black beech. On the cliffs and islands were low forests and shrublands combed flat by wind and exposed to salt spray. The main plants would have been akiraho, ngaio, Cook Strait kowhai (*Sophora molloyi*), kohuhu, mapou, mingimingi (*Leptecophylla juniperina* and *Coprosma propinqua*), tauhinu, coastal shrub daisy (*Olearia solandri*) and pohuehue (*Muehlenbeckia complexa*). Even more exposed and eroding sites would have had a sparse vegetation of wharariki (coastal flax), iceplant, silver tussock, speargrass (*Aciphylla squarrosa*) and salt turf plants. Remnants of all these vegetation types still exist, particularly on the islands. Domestic stock, possums and wilding pines are the main threats to these areas on the mainland.



The flora has features of significance including species more or less confined to the Cook Strait vicinity such as Cook Strait kowhai, the porcupine shrub *Melicactus crassifolius*, the annual seabird colony groundsel *Senecio sterquilinus* and particular forms of *Melicactus* aff. *obovatus*, kohuhu, *Coprosma propinqua* and Cook Strait speargrass. Other notable plants are large-leaved milk tree (*Streblus banksii*), fierce lancewood (*Pseudopanax ferox*), raukawa (*Raukaua edgerleyi*), *Pittosporum cornifolium*, rengarenga (*Arthropodium cirratum*), sea holly (*Eryngium vesiculosum*), *Hebe elliptica*, coastal mat daisy (*Raoulia* aff. *hookeri*) and the mistletoes *Ileostylus micranthus* and *Tupeia antarctica*.

The fauna contains highly significant and distinctive elements. It includes most of the coastal and bush birds of the region. Threatened species include king shag, pied shag, reef heron, New Zealand falcon, marsh crake, kereru, kiwi and kaka. The islands are refuges for these species and others. They are also home to colonies of burrowing seabirds (petrels, prions, shearwaters and penguins), two species of tuatara, several species of lizards (skinks and geckos), Hamilton’s frog, the giant land snail *Powelliphanta hochstetteri bicolor*, giant ground weta and an array of other important endemic or native invertebrates.

Evidence of former Maori settlement - middens, terraces, pits, garden areas and worked stone material - occurs in many places. From the extensive prehistoric quarries on D’Urville Island, material and artefacts were moved throughout the district and further afield. Some of the forest cover was burnt during the pre-European period of settlement, but most of the clearance happened since European arrival. The patterns of farming, established during the latter 19th century and early 20th century, still remain. However, in a reversal of the former trend of destruction and alienation of the indigenous ecosystems, some modern landowners are returning land to native forest and are tackling pests so that the native fauna and flora can flourish. Retirement of land from pastoral farming is also opening up the option of deriving meaningful income from carbon credits.

Weeds that pose significant ecological threats are wilding conifers (mostly pines) and old man’s beard. Animal pests are feral pigs, deer, goats and possums, and smaller predators such as rodents, mustelids and hedgehogs. Wasps are also an ecological problem. The Department of Conservation manages a series of reserves in the ecological district, including most of the islands that are refuges for a range of threatened species.

SURVEY RESULTS

Because Cook Strait Ecological District is one of extremes and occupies a very small part of Marlborough, there are few private land holders. Both of the two properties where the owners were approached were surveyed. A total of six significant sites were identified, with a combined area of 695 ha, making up approximately 12.5% of the total land area of the ecological district. They are classified into five basic categories or ecosystem types (see Table 3). The largest area contains regenerating native shrublands, but there are also coastal cliffs, a dune system, salt turfs, one wetland and small remnants of kohekohe forest. Most sites have high value for ecological significance, reflecting the extreme conditions of Cook Strait.

TABLE 3 - SITES IDENTIFIED IN THE COOK STRAIT ECOLOGICAL DISTRICT

Ecosystem type	Total number of sites	Total area (ha)	% private land area of Ecological District	% total area of Ecological District (DoC and private)
Coastal dune and beach communities	1	12		
Coastal rocky scarp and cliff communities	2	17		
Coastal wetlands	1	10		
Kohekohe forest	1	13		
Lowland shrublands	1	643		
Total	6	695	16.8%	12.5%





ECOSYSTEMS FOUND

Although the original forest cover has largely gone, the elements that influence the native vegetation and fauna remain. The main ecosystems found were:

COASTAL DUNE AND BEACH COMMUNITIES

Features a remarkable dune system with wind-blown sand extending well inland.

COASTAL ROCKY SCARP AND CLIFF COMMUNITIES

Typical of the ecological district, home to distinctive flora and fauna.

COASTAL WETLANDS

One large swamp behind a small sand-gravel beach, much modified for farming.

KOHEKOHE FORESTS

Pockets in gullies and on hillsides, mostly unprotected from farm animals.

LOWLAND SHRUBLANDS

Early successional vegetation of tauhinu, manuka, kanuka and mingimingi, the first stage of coastal forest regeneration.

SPECIAL FEATURES

The ecological district is one of extremes: the tips of land bearing the full brunt of the wildness of Cook Strait. It includes portions of D'Urville and Arapawa Islands, among the largest islands in New Zealand outside the main three, and biologically special because of their freedom from possums. The natural ecosystems and biota are adapted to very rugged topography, violent seas and weather extremes, especially salt-laden gales. The islands are sanctuaries for very special plants and animals and provide a suite of unique opportunities for their long-term conservation.

NATIVE FLORA

- There are several threatened and regionally rare plants such as shore milkweed, large-leaved milk tree (*Streblus banksii*), fierce lancewood (*Pseudopanax ferox*), Cook's scurvy grass (*Lepidium oleraceum*), the native groundsel *Senecio sterquilinus* (associated with seabird activity), Cook Strait kowhai (*Sophora molloyi*), Cook Strait porcupine shrub (*Melicytus crassifolius*), *Melicytus* aff. *obovatus* and the rosette plants *Kirkianella "glauca"* and *Sonchus kirkii*. Some occur on the mainland, but they are mostly on islands.
- Other noteworthy plants that are present include tree hebe (*Hebe parviflora*), the small native daphne *Pimelea urvilleana*, climbing aniseed (*Scandia geniculata*), Cook Strait speargrass (a local form of *Aciphylla squarrosa*) and a local low-growing form of matagouri (*Discaria toumatou*).
- Kohekohe (*Dysoxylum spectabile*) dominates the coastal forest in most places, imparting a subtropical ecological dimension. It is frequently accompanied by wharangi (*Melicope ternata*) and puka (*Griselinia lucida*).
- Karaka (*Corynocarpus laevigatus*) and rengarenga (*Arthropodium cirratum*) and harakeke (*Phormium tenax*) occur in localised pockets. They are associated with past Maori settlement, particularly former garden sites. Stands of cabbage trees might also indicate former settlement sites.

NATIVE FAUNA

- Bush birds are still quite prevalent on the bush-clad islands and mainland. There are strong populations of tui, kereru, weka, bellbird, tomtit, brown creeper, silveryeye, fantail and grey warbler (riroriro). Of note are island populations of New Zealand robin, rifleman, kaka and kakariki. New Zealand falcon (karearea or sparrowhawk) occurs in low numbers and New Zealand pipit is common in open places.



- Coastal birds are common and include gulls, terns, shags, herons, oystercatchers, gannet and various transient waders. Of note are little blue penguin, king shag, pied shag, black shag, Caspian tern and reef heron: all are listed as nationally threatened.
- Seabirds are abundant around Cook Strait, and several burrowing species have breeding colonies on the predator-free islands. They include sooty shearwater, flesh-footed shearwater, fluttering shearwater, diving petrel and fairy prion. Guano deposits indicate former long-established gannet colonies.
- Moa bones and gizzard stones have been found in the ecological district.
- The ecological district is the stronghold for both tuatara species. Stephens Island has the largest population of Cook Strait tuatara (*Sphenodon punctatus*), whilst the only remaining natural population of Brothers Island tuatara (*S. guntheri*) is on North Brother Island.
- The only wild population of the endemic Hamilton's frog (*Leiopelma hamiltoni*) is on Stephens Island.
- Lizards (skinks and geckos) are very common on the predator-free islands and also occur on the mainland. They include several gecko species, including the threatened striped and Duvaucel's geckos and yellow forms of Marlborough green gecko, and several skink species.
- The ecological district has remaining populations of special native invertebrates. The giant land snail *Powelliphanta hochstetteri bicolor* is still present on Arapawa Island, although severely threatened by feral pigs. On predator-free islands are threatened species of giant weta, click beetles, weevils and ground beetles.
- New Zealand fur seals are making a comeback and are frequent around the coast. They breed on Stephens Island. Deposits of rounded pebbles in several places may indicate past populations of New Zealand sea lions. Cook Strait is renowned for whales and dolphins.

COOK STRAIT ECOLOGICAL DISTRICT – PHOTO ESSAY



COASTAL DUNE SYSTEM

This is one of very few dune systems in North Marlborough, and is peculiar in having an elongated slope of sand blown way inland and to an altitude of over 100m. Behind is a mass of volcanic rock, in the crevices of which grow salt turf plants including uncommon species.



REGENERATING COASTAL VEGETATION

Cape Jackson is a peninsula stretching out into Cook Strait. Pastoral farming has ceased and there is now an interesting mosaic of remnant forest, regenerating low forest and scrub (the precursor for regenerating forest). The owners derive income from ecotourism and carbon sequestration as the woody vegetation regenerates.



SPECIAL COASTAL PLANTS

At the tip of Cape Jackson, exposure to strong winds and salt spray is extreme. Nevertheless, plants such as Cook Strait speargrass (foreground and lower right), Cook Strait porcupine shrub, tauhinu and the endemic coastal form of silver tussock, all thrive.



SEABIRDS

Red-billed gull with two chicks. Despite occurring all around the North Marlborough coast, the red-billed gull numbers appear to be dwindling. Cook Strait islands are a main breeding grounds for this species, along with burrowing seabirds like petrels, shearwaters and penguins.





STEEP COASTAL SCARPS

Coastal scarps characterise the Cook Strait ecological district. While in some places still grazed by farm stock, in general they are too steep and have never been cleared or are regenerating in tough shrubs (including endemic species such as Cook Strait kowhai) and flaxes. Even on such precarious and exposed sites as this northwest-facing coastal scarp, native forest exists. Prior to the arrival of exotic predators such as rats, stoats and cats, such sites would have been alive with colonies of burrowing petrels, penguins and other seabirds. Tuatara and several species of skinks and geckos would also have been present.



DRIFTWOOD HABITAT

Driftwood provides an important habitat for various native coastal plants and animals, including shore convolvulus (*Calystegia soldanella*), several insects, katipo spiders, skinks and shore-nesting birds such as banded dotterel and oystercatchers.