



Ninety Mile Swamp N04/033

Each grid is 1000m x 1000m
and = 100 ha.

- S = shrubland
- F = forest
- W = wetland
- E = estuarine
- D = duneland



WAIMIMIHA LAKES

Survey no. N04/034
 Survey date 26 February 1996
 Grid reference N04 264 730, N04 263 735
 Area 16.4 ha
 Altitude < 20 m asl

Ecological unit

- (a) Open water in dune lake
- (b) Raupo reedland on dunes



Waimimiha Lakes N04/034

Each grid is 1000m x 1000m
and = 100 ha.

- S = shrubland
- F = forest
- W = wetland
- E = estuarine
- D = duneland



Landform/geology

Freshwater wetlands ponded between last interglacial foredune ridges and late Holocene coastal dunes.

Vegetation

(a) The southern lake is mostly open water with patches of *Eleocharis sphacelata*.

(b) It is fringed by raupo with occasional *Eleocharis sphacelata*, *E. acuta*, *Isolepis prolifer*, kuta, willow weed, swamp millet and ti kouka.

The northern lake is about 20% open water, type (a) and 80% raupo type (b). Other species present are ti kouka, water fern, willow weed, *Carex* sp. and *Eleocharis* sp.

Both sites are grazed to the margins.

Significant flora

Historical record of *Tbelymitra matthewsii* (Naturally Uncommon-Sparse) which was recorded near here in 1924.

Fauna

Birds: Spotless crane (Regionally significant species) and common waterbirds including a shag breeding area (species unknown but pied and black shag recorded from this site).

Significance

A large area providing good habitat for breeding waterbirds including a shag breeding area and potential habitat for NZ dabchick (Category C threatened species), Australasian bittern (Category O threatened species) and other species.

Representative site for both Ecological units.

KAIKOURA FARMS WETLAND

Survey no.	N04/035
Survey date	26 February 1996
Grid reference	N04 277 769
Area	0.9 ha
Altitude	15 m asl

Ecological unit

- (a) Open water
- (b) Raupo reedland in interdune hollow
- (c) Pampas grassland in lake bed

Landform/geology

Freshwater wetland in interdune hollow on Pleistocene parabolic dunefield.

Vegetation

A small peat depression amongst undulating grass covered sand dunes.

- (a) 70% of the area is open water.
- (b) The remainder is raupo with frequent *Eleocharis sphacelata* and occasional willow weed, *Myriophyllum propinquum*, *Baumea articulata* and *Isolepis prolifer*.
- (c) A small island in the lake is covered in pampas.

The area is grazed to the margins.

Fauna

Birds: Australasian bittern (Category O threatened species) and common waterbirds.

Significance

Habitat for waterbirds including a threatened species.



Kaikoura Farms Wetland N04/035

Each grid is 1000m x 1000m
and = 100 ha.

- S = shrubland
- F = forest
- W = wetland
- E = estuarine
- D = duneland

WOOLSHED SWAMP

Survey no. N04/037
 Survey date 1993
 Grid reference N04 292 813
 Area 1.15 ha
 Altitude 20 m asl

Ecological unit

Baumea articulata-*Eleocharis sphacelata* reedland in interdune hollow

Landform/geology

Freshwater wetland in interdune hollow on Pleistocene parabolic dunefields.



Woolshed Swamp N04/037

Each grid is 1000m x 1000m
and = 100 ha.

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

Vegetation

A fertile swamp of *Baumea articulata* and *Eleocharis sphacelata* with *Juncus* sp., swamp millet, willow weed, pondweed and other wetland species.

Fauna

Birds: Spotless crane (Regionally significant species).

Significance

A small but good quality wetland habitat supporting a regionally significant bird species and potential habitat for Australasian bittern (Category O threatened species).

SWEETWATER STATION PEAT BOWL

Survey no. N04/038
Survey date 7 August 1995
Grid reference N04 283 772
Area 4.2 ha
Altitude 10 m asl

Ecological unit

(a) Open water



Sweetwater Station Peat Bowl N04/038

Each grid is 1000m x 1000m
and = 100 ha.
S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

- (b) *Baumea articulata* reedland on interdune flat
- (c) *Isolepis prolifer-Myriophyllum propinquum* association on interdune flat

Landform/geology

Interdune flat in dunefield of Pleistocene consolidated parabolic dunes.

Vegetation

- (a) Only about 5% of the area is open water, and this varies seasonally.
- (b) Most of the area is abundant *Baumea articulata* with *Eleocharis sphacelata* and raupo.
- (c) *Isolepis prolifer* and *Myriophyllum propinquum* occur around the edges.

Fauna

Birds: Spotless crane (Regionally significant species).

Significance

A dense habitat suitable for the regionally significant spotless crane and other cryptic marsh species.

A representative site for *Baumea articulata* reedland and *Isolepis prolifer-Myriophyllum propinquum* association, only record of the latter in this Ecological District.

WAIMANGO SWAMP

Survey no.	O03/001
Survey date	21 August 1995
Grid reference	O03 430 044
Area	297 ha (162.5 ha shrubland, 134.5 ha wetland)
Altitude	0-15 m asl

Ecological unit

- (a) *Baumea buttonii-B. juncea* sedgeland in dune hollow
- (b) Raupo reedland in dune hollow
- (c) Manuka swamp-shrubland in dune hollow
- (d) Kanuka/manuka shrubland on consolidated dunes
- (e) Gorse scrub on consolidated dunes

Landform/geology

Freshwater wetland ponded between a Holocene coastal foredune belt and last interglacial consolidated foredunes. Part mineralised, part peat swamp.

Vegetation

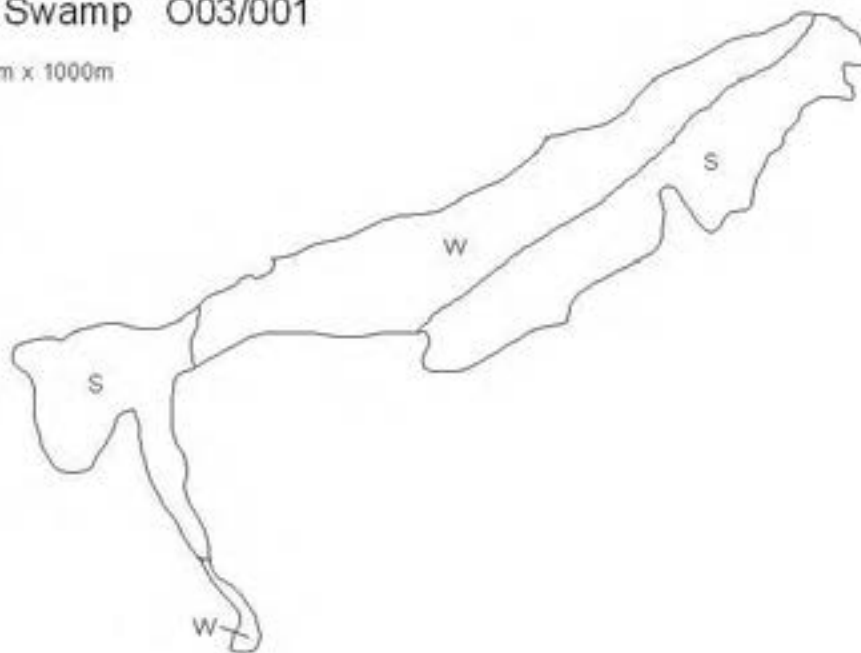
- (a) Much of the area is *Baumea buttonii* and *B. juncea* with other sedges such as *Schoenus* sp., *Carex secta* and other *Carex* species. Kiokio and willow weed are also present.
- (b) There are some smaller areas of raupo and harakeke.
- (c) Manuka is a dominant emergent with *Coprosma tenuicaulis*.
- (d) On drier areas kanuka/manuka shrubland occurs with locally frequent gorse, prickly hakea and pampas. Scattered *Cassutha*, kumarahou, ti kouka, mamaku, *Eucalyptus* sp. and brush wattle are also present.



Waimango Swamp O03/001

Each grid is 1000m x 1000m
and = 100 ha.

- S = shrubland
- F = forest
- W = wetland
- E = estuarine
- D = duneland



(e) There is a small area of gorse scrub (2%) with scattered pasture.

Significant flora

1995 record of *Lycopodiella serpentina* (Vulnerable). 1998 record of *Cyclosorus interruptus* (Declining) and Bartlett recorded *Thelypteris confluens* (Vulnerable) from this site in 1978. A 1998 threatened plants survey confirmed this record.

1999 record of *Eleocharis neozelandica* (Declining).

Cryptostylis subulata (Naturally Uncommon-Range Restricted) recorded in 1990.

Fauna

Birds: Northern NZ dotterel and wrybill (both Category B threatened species), banded dotterel (OSNZ year 2000 record), variable oystercatcher and white-fronted tern (all Category C threatened species), reef heron (OSNZ year 2000 record), Australasian bittern and Caspian tern (all Category O threatened species), NI fernbird (Regionally significant species), turnstone, several sandpiper species including turnstone and NZ pipit.

Aquatic fauna: 1998 record of black mudfish (Category C threatened species), banded kokopu (Category C threatened species), common bully.

Significance

A good example of a formerly widespread coastal wetland complex which is habitat for many threatened plants and animals.

Representative site for type (a) *Baumea buttonii*-*B. juncea* sedgeland, type (c) manuka swamp shrubland, and (d) kanuka/manuka shrubland.

Approximately 46.6% of this site is protected; 118 ha is Stewardship Land and 20.6 ha is Recreation Reserve both administered by the Department of Conservation.

ROKAWAU LAKES & PUWHEKE BEACH

Survey no.	O03/002
Survey date	22 August 1995, 1 December 2001
Grid reference	O03 390 035
Area	433.6 ha (287.1 ha shrubland, 97.9 ha wetland, 48.6 ha duneland)
Altitude	1-20 m asl

Ecological unit

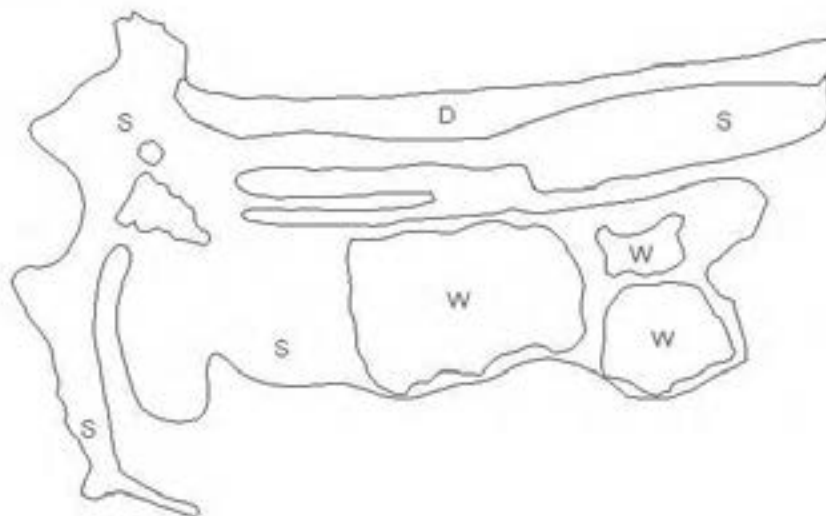
- (a) Open water in dune lake
- (b) Pohutukawa coastal association on lake margin
- (c) Manuka swamp shrubland on interdune flats and hollows
- (d) Kanuka/manuka shrubland on dunes and consolidated dunes
- (e) Pingao sedgeland on dunes
- (f) *Spinifex* grassland on foredune
- (g) *Coprosma acerosa*-pohuehue association on dunes
- (h) *Coprosma acerosa*-oioi-pohuehue association on dunes



Rotokawau Lakes & Puwheke Beach O03/002

Each grid is 1000m x 1000m
and = 100 ha.

- S = shrubland
- F = forest
- W = wetland
- E = estuarine
- D = duneland



- (i) Raupo reedland in dune hollow
- (j) Gorse-kanuka shrubland on dunes
- (k) Oioi rushland on sand flats and in dune hollow
- (l) Harakeke reedland in dune hollow
- (m) *Coprosma tenuicaulis*-manuka swamp shrubland on alluvium

Landform/geology

Lakes and freshwater wetlands ponded between Pleistocene consolidated parabolic dunes and last interglacial consolidated foredunes.

Vegetation

A complex of lakes with a hard sand pan, wetlands and shrublands linked to the Puwheke Beach dunes.

Lakes

- (b) Along the steep southern shore of Lake Rotokawau there are pohutukawa trees emergent over *Hakea salicifolia*, wattle, houpara, taupata and ti kouka.
- (c) Manuka is dominant, with harakeke, raupo, umbrella fern, *Baumea* sedges, kuta, *Eleocharis sphacelata*, *E. acuta* and *Lepidosperma* sedge surrounding the lake.

There is a similar shrub-sedge zone around the smaller lake.

Schoenus and wire rush are locally dense. The smaller lake is slightly eutrophic, with about 10% of the area in aquatic plants. Willow weed and *Myriophyllum* sp. are present.

The threatened bog clubmoss *Lycopodiella serpentina* has been recorded near the small lake.

- (d) The surrounding shrubland is mostly kanuka/manuka between 1-3m with locally frequent gorse, Sydney golden wattle and pampas. Other species present in the canopy include mamaku, ti kouka, houpara, black wattle, brush wattle and pine. Near the Rangiputa coast, pohutukawa is frequent.

Dunes

- (e) On the shifting foredunes pingao and type (f) *Spinifex* are common.
- (g) Behind the foredune at the eastern end, which is more modified, *Coprosma acerosa* and pohuehue are common. *Pimelea arenaria* occurs in isolated patches. The adventive annual *Senecio elegans* is seasonally common throughout.

Landward of the vehicle track behind the dunes, *Spinifex* is common type (f) with pohuehue, buffalo grass and small clumps of knobby clubrush. Bracken is locally common and *Carex flagellifera* is scattered.

Harestail, *Calystegia soldanella*, and apple of Sodom occur rarely. Gorse and kikuyu are locally abundant, gorse comprising about 30% of the area and grading into kanuka on the higher slopes of the back dune.

- (h) From about midway towards the stream mouth, *Coprosma acerosa*, oioi and pohuehue are common on the dunes with *Baumea juncea* and occasional harakeke, pampas and bracken. There are fewer exotics here, apart from occasional patches of gorse. On the flats behind the foredune, manuka is found, with clumps of gorse being more common closer to the back dune.

(i) Near the river the dunes are more pristine, with only two patches of gorse. There is a small raupo wetland about 50 X 20 m in a hollow beneath the back dune.

(j) On the back dune gorse and kanuka are dominant with mingimingi, *Leucopogon fraseri*, *Lepidosperma laterale*, *Coprosma rhamnoides*, Sydney golden wattle and ti kouka all occurring rarely. *Tetragonia trigyna* is locally common.

Stream

Where the stream loops around the foredune, oioi is abundant. Raupo, *Eleocharis* sp., harakeke, *Baumea articulata* and jointed rush occur in small numbers. Ten to twenty pampas bushes occur here.

The stream is lined with oioi with some small patches of raupo.

On the sand flats, *Lilaeopsis novae-zelandiae* occurs.

Pingao is abundant type (e) on the dunes around the stream mouth.

Toetoe occurs on the back dune at this part of the beach.

In the lee of the dunes manuka is abundant type (c), with occasional harakeke, hakea and coastal toetoe, with bracken and oioi in the understorey.

Wetlands

A series of wetlands occur in the hollow behind the back dunes. Oioi is dominant type (k), with frequent *Baumea juncea*. *Cryptostylus subulata* is present.

Manuka occurs in small patches, with occasional coastal toetoe, ti kouka and mamaku.

(l) Harakeke is common in an area behind the back dunes (approximately O03 384 041), with frequent manuka and areas of bracken, *Gleichenia dicarpa*, wirerush, *Baumea teretifolia*, *Baumea* sp. and patches of Sydney golden wattle.

(m) Directly west of Lake Rotokawau *Coprosma tenuicaulis* and manuka swamp shrubland occurs with bracken, sedges, giant umbrella sedge, *Carex virgata* and occasional ti kouka and harakeke.

Shrubland

In the hollow behind the backdune, type (c) dense manuka to 3 m occurs. In the understorey, *Schoenus tendo* is common, with occasional mingimingi, *Coprosma tenuicaulis* and kiokio.

This area is seasonally wet, with flow from Puheke Rd parallel to the beach, towards the west.

Significant flora

Lycopodiella serpentina and 1999 record of *Todea barbara* (both Vulnerable), *Pimelea arenaria* (Declining), pingao (Recovering–Conservation Dependent), *Thelymitra* (a) (Taxonomically Indeterminate–Endangered), *Cryptostylis subulata* (Naturally Uncommon–Range Restricted), *Pellaea falcata* (Naturally Uncommon–Sparse) recorded from sea cliffs at Puwheke.

Wire rush, *Utricularia delicatula* and *Hebe diosmifolia* (all Regionally significant species).

Cyclosorus interruptus (Declining) was recorded from the north side of Lake Rotokawau in 1978.

Fauna

Birds: Northern NZ dotterel (2001 record) (Category B threatened species), NZ dabchick, white-fronted tern and variable oystercatcher (confirmed 2001) (all Category C threatened species), Caspian tern and Australasian bittern (both Category O threatened species), NI fernbird (2001), spotless crane and NZ scaup (all Regionally significant species), pied stilt, and Australasian little grebe, and other common waterbirds.

Past records of marsh crane (Regionally significant species).

The site supports a large colony of shags - black shag, pied shag, little black shag and little shag.

Aquatic fauna: 1999 record of black mudfish (Category C threatened species), inanga, common bully, short-finned eel.

Snails: Archey's dune snail (Serious Decline).

Significance

A large area, one of the best examples in the Ecological Region of a wide diversity of habitats including coastal wetlands stretching from the Rangiputa coast to Karikari Moana, containing high wildlife values including many threatened species.

Dune lakes are a rare habitat type in Northland and are especially rare on the east coast of Northland.

Representative site for 10 Ecological units, type (a) open water, type (b) pohutukawa coastal association, type (c) manuka swamp shrubland, type (d) kanuka/manuka shrubland, type (e) pingao sedgeland, type (g) *Coprosma acerosa*-pohuehue association, type (h) *Coprosma acerosa*-oioi-pohuehue association, type (k) oioi rushland, type (l) harakeke reedland, and type (m) *Coprosma tenuicaulis*-manuka swamp shrubland.

Only record of type (b), (g), (h), and (m) in the Ecological District.

Type (b) pohutukawa coastal association associated with dune lakes is a very rare Ecological unit in Northland (P.J. Anderson pers. comm. 2002).

Marginal Strip, 65.4 ha, administered by the Department of Conservation protects Lake Rotokawau and the smaller eastern lake.

MAITAI BAY

Survey no.	O03/003
Survey date	22 August 1995
Grid reference	O03 482 085, O03 495 075
Area	23.9 ha
Altitude	0-10 m asl

Ecological unit

- (a) *Spinifex*-Cape honey flower association on dunes
- (b) Pohutukawa treeland on rocky cliffs and headlands

Landform/geology

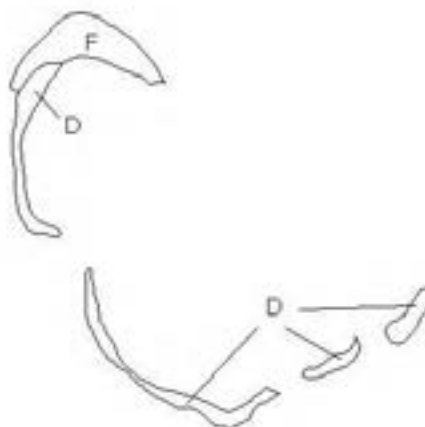
Holocene coastal foredunes.



Maitai Bay O03/003

Each grid is 1000m x 1000m
and = 100 ha.

- S = shrubland
- F = forest
- W = wetland
- E = estuarine
- D = duneland



Vegetation

A sandy bay with rocky points at either end.

(a) *Spinifex* dominates the sand dune vegetation. Cape honey flower is common and locally dense over kikuyu. *Pimelea arenaria*, pingao, tauhinu and knobby clubbrush are scattered.

(b) The rocky points are vegetated with pohutukawa. Mamaku, ti kouka, harakeke and pampas also occur.

Significant flora

Presence of *Pimelea arenaria* (Declining) (1999 record) and pingao (Recovering-Conservation Dependent).

Hebe aff. *pubescens* (Regionally significant species) has been recorded from Maitai Bay, which is the only site known in Northland.

Fauna

Birds: Northern NZ dotterel (Category B threatened species), variable oystercatcher and white-fronted tern (both Category C threatened species), Caspian tern and reef heron (both Category O threatened species).

Lizards: 1990 record of shore skink.

Marine reptiles: 1997 record of leathery turtle.

Significance

A long beach area providing habitat for coastal plant and bird species including several threatened species.

The Maitai Bay beaches are classified as regionally significant in the inventory of important geological and landform sites in the Northland Region for their unspoilt scenic beauty (Kenny & Hayward 1996).

Representative site for pohutukawa treeland.

Approximately 10.4 ha of the northern end of this site is protected by the Maitai Bay Recreation Reserve which is administered by the Department of Conservation.

TAUPIROROA RANGE SHRUBLANDS

Survey no.	O03/004
Survey date	21 August 1995
Grid reference	O03 455 050, O03 476 022, O03 470 040, O03 483 037, O03 470 026, O03 485 035
Area	945 ha (19 ha forest, 926 ha shrubland)
Altitude	1-190 m asl

Ecological unit

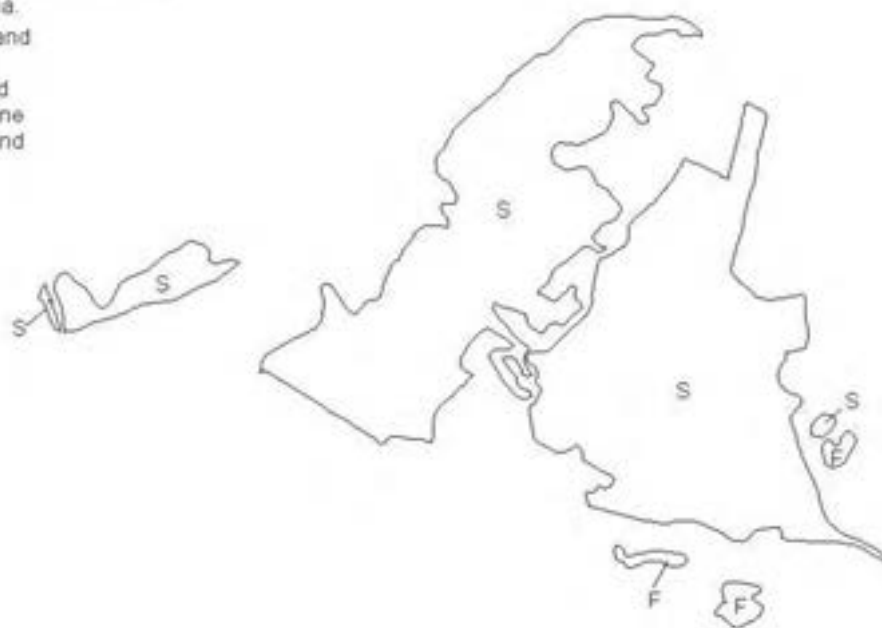
- (a) Manuka-kanuka shrubland on hillslope
- (b) Gorse-prickly hakea-sedge association on hillslope
- (c) Kanuka shrubland on hillslope
- (d) Kanuka-puriri forest on hillslope
- (e) Kanuka-pohutukawa coastal forest on hillslope



Taupiroroa Range Shrublands O03/004

Each grid is 1000m x 1000m
and = 100 ha.

- S = shrubland
- F = forest
- W = wetland
- E = estuarine
- D = duneland



- (f) Kanuka-gorse shrubland on hillslope
- (g) Gorse-kikuyu-sedge association on dunes and sand flats

Landform/geology

Pleistocene consolidated dune sand forming low rolling country in the north and west, with underlying deeply weathered Houhora Complex volcanics forming the Taupiroroa Range in the south-east.

Vegetation

(a) Behind the Whatuwihwi settlement, the Taupiroroa Range is a mosaic of manuka-kanuka shrubland 1-2 m.

(b) Gorse is locally abundant and prickly hakea common. Sedges are also common. Other species present are kumarahou, mingimingi, *Epacris pauciflora*, *Dracophyllum lessonianum*, *Eucalyptus* sp., pampas, prickly mooses and brush wattle.

A large area of the heathland types (a) and (b) have been cleared since the original survey.

(c) There is a small area of kanuka shrubland about 3m with frequent mahoe and occasional karaka and houpara.

(d) To the east amongst the pines is a small remnant of tall kanuka forest in which puriri is common and ti kouka occasional, and another similar remnant in which mahoe is frequent and kahikatea and mamaku also occur.

(e) Along the south coast are two areas of secondary coastal forest, kanuka dominant in which pohutukawa is common. Mahoe, ti kouka, tobacco weed and brush wattle are also present.

(f) Across the road to the west is an extensive area of shrubland, most of which is low kanuka. Gorse is common, manuka frequent and mamaku, pampas and *Eucalyptus* sp. occasional. About 20% is manuka-kanuka-gorse to 2-3 m.

(g) Around the tidal stream gorse is abundant. Sedges and kikuyu are common, bracken and tobacco weed frequent, ti kouka and mamaku occasional.

Significant flora

Hibiscus diversifolius (Vulnerable) has been recorded near the Wairahoraho Stream mouth (Bartlett, 1987). In 1978 Bartlett also recorded *Lycopodiella serpentina* (Vulnerable) in the vicinity of what is now the camping ground. *Euphorbia glauca* (Declining) recorded in 1985. 1998 record of *Eleocharis neozelandica* and *Pimelea arenaria* (Declining).

Fauna

Birds: Not surveyed.

Aquatic fauna: Common bully (1993) record from Wairahoraho Stream.

Significance

A large shrubland area with pockets of coastal forest adjoining the coast linking the various wetlands, sand dunes, forest remnants and shrublands that stretch across Karikari Peninsula from Karikari Moana to Doubtless Bay and through the pine plantation to Knuckle Point.

Presence of threatened plant species.

Representative site for type (a) manuka-kanuka shrubland, type (d) kanuka-puriri forest, type (e) kanuka-pohutukawa coastal forest. Only record of type (d) in the Ecological District.

Approximately 21.9 ha (2.3%), is protected within the Puwheke Recreation Reserve which is administered by the Department of Conservation.

CAPE KARIKARI SHRUBLAND

Survey no.	O03/005
Survey date	22 August 1995
Grid reference	O03 474 127, O03 475 090
Area	444 ha (5.4 ha forest, 430 ha shrubland, 8.6 ha wetland)
Altitude	0-106 m asl

Ecological unit

- (a) Kanuka/manuka shrubland on cliff tops
- (b) Pohutukawa forest on steep coastal slopes
- (c) *Eleocharis* sp.-raupo association on dunes

Landform/geology

Rocky promontory of Karikari Plutonics diorite to quartz monzonite intrusions with overlying Pleistocene consolidated dune sands.

Vegetation

- (a) Most of the area is kanuka/manuka shrubland 1-3 m. Gorse and prickly hakea are frequent. Other species occurring are kumarahou, mingimingi, akeake and sedges.
- (b) Near Cape Karikari is a small remnant of pohutukawa forest. Mamaku and pampas are frequent, and harakeke and ti kouka also present.
- (c) A small swamp is found at the head of Whataru Bay with dense *Eleocharis* sp.-raupo, some *Juncus* sp. and occasional open water.

Significant flora

The threatened clubmoss *Lycopodiella serpentina* (Vulnerable) was recorded from this site in 1978.

Fauna

Birds: Australasian bittern (Category O threatened species).

Lizards: Northland green gecko (Regionally significant species). 1980 record of Pacific gecko from just outside this site at Kototutea Point.

Significance

A large shrubland area on Cape Karikari that provides an important function of linking the various wetlands, sand dunes, forest remnants and shrublands of Maitai Bay and Karikari Moana.

A representative site for all three Ecological units.

Approximately 14% of this site, 62.5 ha, is protected Scenic Reserve administered by the Department of Conservation.



Cape Karikari Shrubland O03/005

Each grid is 1000m x 1000m
and = 100 ha.

- S = shrubland
- F = forest
- W = wetland
- E = estuarine
- D = duneland



WHANGATUPERE BAY

Survey no.	O03/006
Survey date	22 August 1995, 27-28 May 2002
Grid reference	O03 510 060
Area	1,018 ha (65 ha forest, 953 ha shrubland)
Altitude	0-165 m asl

Ecological unit

- (a) Kanuka/manuka shrubland on gently sloping gumland and rolling to steep hillslopes
- (b) Gorse scrub on coastal hillslope
- (c) Kanuka forest on steep coastal hillslope
- (d) Kanuka-pohutukawa coastal forest on steep coastal hillslope and coastal fringe
- (e) Kohekohe coastal forest on gentle slope
- (f) Towai forest in gully
- (g) *Baumea* sp. wetland on alluvium

Landform/geology

Hill country of highly weathered diorite to quartz monzonite intrusions of Karikari Plutonics cutting Houhora Complex greywacke.

Vegetation

A mosaic of kanuka/manuka shrubland with broadleaf dominant coastal forest at Poroa Stream, Tapakakeno Point and Brodies Creek.

(a) The shrubland varies between 1 m and 3 m. In about 20% of the area gorse is common and prickly hakea frequent. Other species present are ti kouka, hangehange, kumarahou, mingimingi, akeake, *Cassytba*, sedges, brush wattle, pampas, Cape honey flower and tobacco weed.

Kanuka emergent over shorter kanuka and manuka occurs on gumland. The gumland area stretches from the high point of Koware across to Brodies Creek.

(b) Gorse is abundant in about 10% of the area, towards Pihakoa Point.

(c) Between Takini Point and Poroa Stream there is tall kanuka forest with pohutukawa and puriri. Karaka, wharangi, tawapou and houhere are present. The understorey is open with *Coprosma macrocarpa*, hangehange, rangiora, turepo, mahoe, NZ spinach, *Peperomia urvilleana*, kowharawhara, *Carex* sp., common shield fern, rasp fern, common maidenhair, rosy maidenhair, shaking brake and *Pteris saxatilis* (P. Bellingham unpublished data).

Type (c) also occurs on the ridge where kanuka is dominant with mapou and *Pittosporum umbellatum*. The main understorey consists of hangehange, *Coprosma rhamnoides*, native broom, harakeke, and rasp fern. Also present are mingimingi, *Cyathodes juniperina*, *Pomaderris phyllicifolia*, tauhinu, pohuehue, *Gabnia lacera* and rarely, houpara and ponga.

(d) On the cliffs toward Tapakakeno Point, kanuka and pohutukawa are dominant with puriri. Ti kouka is locally common and harakeke is frequent.

At Brodies Creek there is a larger area of kanuka-pohutukawa forest with kohekohe, ti kouka, tawapou, mahoe, tree ferns, macrocarpa and gum trees. Mature pohutukawa are conspicuous on the coastal fringe. The environmental



Whangātupere Bay O03/006

Each grid is 1000m x 1000m
and = 100 ha.

- S = shrubland
- F = forest
- W = wetland
- E = estuarine
- D = duneland



weeds Cape honey flower and smilax are also common on the coastal fringe. Around the western point of Brodies Creek pohutukawa is more dominant with harakeke, and kohekohe.

(e) Dominant secondary kohekohe forest occurs on the western side of Brodies Creek. Pohutukawa is frequent, with ti kouka, mahoe, kanuka and wheki occasional.

(f) On the eastern side of the highpoint of Koware, dominant secondary towai forest occurs in a gully with kanuka, mamaku, and the odd pohutukawa. Around this kanuka and towai is common with hangehange.

(g) A small acid wetland (not mapped) dominated by *Baumea* sp. occurs at Knuckle Point in the head of the valley system flowing down to Brodies Creek.

Significant flora

Colensoa physaloides (Declining) (1999 record) and *Fuchsia procumbens* (Naturally Uncommon-Sparse) are recorded from this area (P. Bellingham 1993 unpublished data). Tawapou (Regionally significant species).

Fauna

Birds: kukupa (Category B threatened species), white-fronted tern (Knuckle Point Stack) (Category C threatened species), NI fernbird (Regionally significant species).

Lizards: Suter's skink and ornate skink (both Regionally significant species), Pacific gecko, shore skink.

Snails: *Allodiscus fallax* (Nationally Endangered), found in the forest near Tapakakeno Point which is the type locality (possibly the only site) for this species which is endemic to the Karikari Peninsula. *Cytora* sp. "whangatupere" (Nationally Endangered) known from a small remnant of coastal forest at this site.

Invertebrates: *Onychophoran*, a Peripatus-type organism is recorded from this site, possibly at its northern limit, and certainly the only locality in the Aupouri Ecological Region.

Marine mammals: A small NZ fur seal haul-out site is known from Knuckle Point.

Significance

Large shrubland area on the eastern side of Karikari Peninsula with three pockets of coastal forest adjoining the coast. These remnants are rare in the Ecological Region and in Northland generally. The shrubland links these forest remnants to each other, to Maitai Bay, and through the pine plantations, to Taupiroroa.

Representative site for type (a) kanuka/manuka shrubland, type (c) kanuka forest, type (d) kanuka-pohutukawa coastal forest, type (e) kohekohe coastal forest, and type (f) towai forest. Towai forest is unrecorded elsewhere in the Ecological District.

Forest and shrubland at Whangatupere Bay is the only mainland site in the Ecological District to occur on Karikari Plutonics intruding Houhora Complex. Knuckle Point is one of a handful of NZ fur seal haul-out sites on the east coast of Northland.

A geopreservation site of regional importance for:

- reasonably well exposed Karikari hornfels from Maitai Bay to Brodies Creek
- older and younger Karikari Plutonics

- most complete and best example in Northland of Cretaceous sedimentary sequence and possibly the only example of autochthonous Cretaceous outcropping (Kenny & Hayward 1996).

Approximately 72% of this site is protected. Recreation Reserve, 347 ha and 0.7 ha of Marginal Strip protects 36% of the site, and a 2002 purchase protects a further 378 ha, at Knuckle Point, as Scenic Reserve; the site is administered by the Department of Conservation.

S URLICH RD WETLAND

Survey no. O03/008
 Survey date 22 August 1995
 Grid reference O03 444 001, O03 443 012
 Area 29 ha
 Altitude 1-8 m asl

Ecological unit

- (a) Gorse-kanuka/manuka shrubland on dunes
- (b) Harakeke-raupo reedland in dune hollow
- (c) Harakeke reedland in dune hollow

Landform/geology

Holocene foredune belt backed by last interglacial consolidated foredunes and with intercalated Holocene sandy alluvium and freshwater wetlands.

Vegetation

- (a) Most of the area is gorse-kanuka/manuka shrubland. Ti kouka, pampas and pine are occasional.
- (b) Harakeke and raupo are common in the wetlands, with occasional ti kouka.
- (c) Harakeke is locally abundant with frequent manuka and ti kouka and occasional taupata and mamaku. Gorse is locally common.

Fauna

Australasian bittern (Category O threatened species) present in 1994 (T. Beauchamp pers. comm.).

Significance

Harakeke dominant wetlands are rare in the Ecological Region and upper Northland generally.

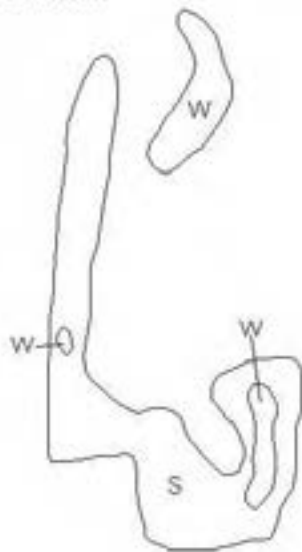
Representative site for type (b) harakeke-raupo reedland and type (c) harakeke reedland. One of only two records of type (c) harakeke reedland, in the Ecological District, the other occurring on Moturoa Islands (O03/012).

Approximately 12.79 ha of this site (44%) falls under the protection of Tokerau Beach, Department of Conservation administered Stewardship Land.



S Ulrich Rd Wetland O03/008

- Each grid is 1000m x 1000m
 and = 100 ha.
 S = shrubland
 F = forest
 W = wetland
 E = estuarine
 D = duneland



KARIKARI MOANA

Survey no. O03/009
Survey date 22 August 1995
Grid reference O03 455 064
Area 136 ha
Altitude 0-8 m asl

Ecological unit

Spinifex grassland on dunes



Karikari Moana O03/009

Each grid is 1000m x 1000m
and = 100 ha.

- S = shrubland
- F = forest
- W = wetland
- E = estuarine
- D = duneland

Landform/geology

Holocene foredune belt with deflation zones at south-western end.

Vegetation

Spinifex is abundant on the dunes at the eastern end of the beach. *Coprosma acerosa* is frequent. Pingao, tauhinu, knobby clubbrush and bare areas of sand occur occasionally.

At the western end of the beach the dunes are more sparsely vegetated. However *Spinifex* is common and pingao frequent.

Significant flora

1992 record of the threatened *Austrofestuca littoralis* and *Pimelea arenaria* (both Declining), pingao (Recovering-Conservation Dependent), and a 1949 record of *Atriplex hollowayi* (Critically Endangered).

Fauna

Birds: Northern NZ dotterel (Category B threatened species), banded dotterel, white-fronted tern and variable oystercatcher (all Category C threatened species), reef heron and Caspian tern (both Category O threatened species).

Significance

High-quality and representative duneland habitat for threatened species. Important breeding area for northern NZ dotterel, banded dotterel and variable oystercatcher, and roosting and potential breeding area for white-fronted terns and Caspian terns.

Recreation Reserve administered by the Department of Conservation protects approximately 37 ha or 27.2% of this site.

PUHEKE RD WETLAND

Survey no.	O03/011
Survey date	22 August 1995
Grid reference	O03 406 027
Area	0.4 ha
Altitude	sea level

Ecological unit

Pasture grassland in boggy interdune hollow

Landform/geology

Freshwater wetland in hollow on interdune flat on Pleistocene parabolic dunefield.

Vegetation

Poorly drained pasture with scattered manuka, gorse and rushes.

Significant flora

Lycopodiella serpentina (Vulnerable), *Thelymitra* (a) (Taxonomically Indeterminate-Endangered) and *Utricularia delicatula* (Regionally significant species).



Puheke Rd Wetland O03/011

Each grid is 1000m x 1000m
and = 100 ha.

- S = shrubland
- F = forest
- W = wetland
- E = estuarine
- D = duneland

Fauna

Not surveyed.

Significance

Habitat for several threatened plants.

MOTUROA ISLANDS

Survey no.	O03/012
Survey date	1968, 1976, 1985
Grid reference	O03 427 145, O03 437 133, O03 440 128, O03 455 125, O03 470 138
Area	27.2 ha – Moturoa Island 9.15 ha; Motutapu Island 3.5 ha; Sugarloaf 0.7 ha; Tuputupangahau Island 12.34 ha; Rocky Island 1.5 ha
Altitude	0-56 m asl

Ecological unit

- (a) Buffalo grass grassland on hillslope
- (b) *Melicytus novae-zelandiae*-taupata shrubland on hillslope
- (c) Herbfield on coastal banks
- (d) Harakeke reedland on coastal slopes
- (e) Ti kouka-harakeke-manuka-pampas association on hillslope
- (f) Karamu-manuka-taupata shrubland on hillslope
- (g) *Zoysia pauciflora* grassland on hillslope
- (h) *Poa pusilla* grassland on plateau
- (i) Native iceplant association on rock
- (j) Manuka shrubland on coastal slopes
- (k) Giant umbrella sedge-harakeke association on coastal slopes
- (l) Pohuehue association on coastal slopes
- (m) Karo shrubland on plateau

Landform/geology

Islands formed of Karikari Plutonics intruding Houhora complex rocks.

Vegetation

A group of five named islands, one vegetated stack and several bare rocks and stacks (Miller 1985). Tuputupangahau Island was extensively modified and the current vegetation differs from the other islands, which are covered predominantly with taupata-*Melicytus novae-zelandiae*.

Tuputupangahau Island (Whale Island)

Dense buffalo grass, type (a) occurs above Commodore Bay with scattered mingimingi, manuka, ti kouka and rasp fern, with harakeke common towards the ridge.

(b) *Melicytus novae-zelandiae* and taupata with occasional ti kouka, harakeke and hangehange occurs to the east of Commodore Bay and Driftwood Bay.

(c) An association of coastal species including *Samolus repens* and *Paspalum distichum* grow in crevices just above high water and backed by a belt of oiioi with *Deyuexia billardieri* and *Paspalum dilatatum* scattered amongst it.

(d) This is adjoined by dense harakeke with large clumps of shining spleenwort, *Asplenium flaccidum* spp. *haurakiense*, large inkweed plants near the shore, and kiokio, *Pteris* sp. and *Hypolepis* sp. ferns elsewhere.

(e) Ti kouka-harakeke-manuka-purple pampas are dominant between Annie Bay and the eastern side of the island. Cape honey flower also occurs.



Moturoa Islands O03/012

Each grid is 1000m x 1000m
and = 100 ha.

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

- (f) On the northeastern coast, karamu-manuka-taupata occur.
- (g) *Zoysia pauciflora* occurs in dense swards on the central northern coast with occasional mingimingi, manuka and tauhinu.
- (h) A meadow of *Poa pusilla*, occurs on the northern area of the summit, with a wide variety of adventive species scattered amongst it.
- (i) Native iceplant, rengarenga lily and the fern *Asplenium obtusatum* spp. *northlandicum* occur on rocky cliffs of stacks, and exposed slopes are covered in pohuehue.
- (j) Manuka dominant shrubland with harakeke, ti kouka and mingimingi covers the rest of the summit.

Moturoa Island

Coastal association, type (c), is dominated by knobby clubbrush, glasswort, Mercury Bay weed, *Rbagodia triandra* and *Paspalum distichum*.

Most of the vegetation is type (b), with both *Melicytus novae-zelandiae* and taupata being locally dominant. Pohuehue is common, type (l).

Interspersed with this type is type (k), open areas of giant umbrella sedge and harakeke with poroporo. Karo is occasional.

Karaka and houpara occur in a sheltered valley.

Extensive mats of native iceplant type (i), occur.

Trig Rock

A small vegetated rock (approx 0.5 ha) south-east of Moturoa Island.

The vegetation includes type (i) with occasional clumps of *Rbagodia*, sea spurrey, knobby clubbrush, umbrella sedge and glasswort, and type (b) with pohuehue.

(m) Karo is locally common near the summit with shining spleenwort and *Asplenium obtusatum* spp. *northlandicum* below.

Sugarloaf Island

Taupata is dominant with *Melicytus novae-zelandiae* and kikuyu locally dominant, type (b). Other species present include umbrella sedge, poroporo, and exotic herbs. Type (i) is present and the splash zone vegetation includes glasswort, Mercury Bay weed and *Paspalum distichum*.

Motutapu Island (Green Island)

Types (b) and (i) predominate. Shining spleenwort is common in damp areas and purple pampas locally dominant on exposed ridges and headlands.

Rocky Island

Type (b) with clumps of purple pampas and umbrella sedge on the summit. Native iceplant, glasswort, Mercury Bay weed, *Samolus repens*, sea spurrey and *Paspalum distichum* occur on the margins.

Fauna

Birds: Breeding site for blue penguin, fluttering shearwater, little shearwater, grey-faced petrel, white-faced storm petrel, diving petrel; possibly Australasian gannet.

Threatened bird species recorded include two Category C threatened species, white-fronted tern and variable oystercatcher. Caspian tern and reef heron (both Category O threatened species).

Lizards: robust skink (Moturoa Island) (Category B threatened species), Suter's skink and ornate skink (Regionally significant species), Pacific gecko and shore skink.

Significance

Considered by Adams (1968) to be one of the more important breeding areas for sea birds in northern New Zealand. Its apparent rat-free status makes it especially valuable as habitat for species such as the robust skink, which is only known on five rat-free islands, and for breeding colonies of seabirds.

The main vegetation types of native iceplant and *Melicytus novae-zelandiae*-taupata shrubland are now restricted in distribution mainly to offshore islands and are uncommon in both the District and Region.

Representative site for 12 Ecological units, from type (b) through to type (m), all of which are not recorded on other island habitats in the Ecological District. Site description drawn from: Adams (1968); Farley (1977); Hitchmough (1977); Staveley Parker (1977); Wright (1977); Miller (1985).

WAIMANONI CREEK SHRUBLAND

Survey no. O04/217
 Survey date 8 August 1995
 Grid reference O04 334 873
 Area 3.4 ha
 Altitude 0-5 m asl



Waimanoni Creek Shrubland O04/217

Each grid is 1000m x 1000m
 and = 100 ha
 S = shrubland
 F = forest
 W = wetland
 E = estuarine
 D = duneland

Ecological unit

Totara treeland on alluvial flats

Landform/geology

Estuarine/alluvial flats bounding Waimanoni Creek.

Vegetation

Totara to 10 m is emergent over abundant divaricating shrubs. Ti kouka and tobacco weed are frequent and gorse is present.

Fauna

Not surveyed.

Significance

A small shrubland which is an uncommon habitat type and adjacent to mangroves.

A representative site and only occurrence of this Ecological unit in the Ecological District.

Further surveying is recommended as there may be threatened species at this site.

PAPARORE WETLAND & SHRUBLAND

Survey no.	O04/220
Survey date	14 August 1995, 26 February 1996
Grid reference	O04 309 901, O04 309 895
Area	38 ha (17.5 ha shrubland, 20.5 ha wetland)
Altitude	0-10 m asl

Ecological unit

- (a) Manuka swamp shrubland on peat
- (b) Raupo reedland on alluvium
- (c) Kanuka/manuka shrubland on alluvium

Landform/geology

Freshwater wetland on alluvium/estuarine deposits at the head of Rangaunu Harbour.

Vegetation

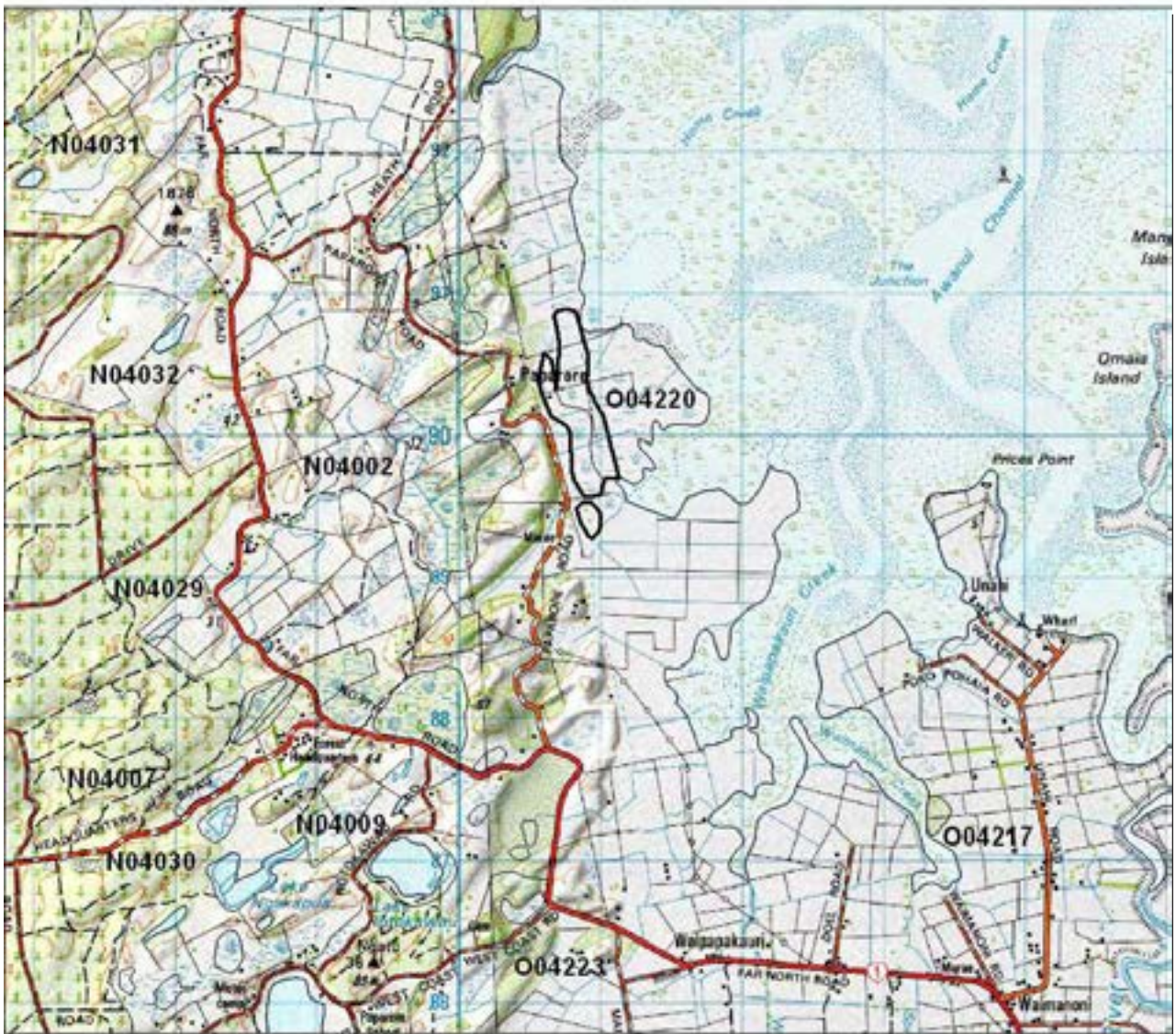
(a) The north of this site is a semi-wet manuka shrubland on peat. Kanuka occurs frequently. Also present are umbrella fern, kiokio, harakeke, water fern, ring fern, rasp fern, wheki, mamaku, pohuehue, *Coprosma tenuicaulis*, *Astelia grandis*, *Hebe* and gorse.

(b) Further south near the salt water influence is a raupo swamp with sedges. Gorse occurs frequently. Harakeke, wheki, mamaku, kanuka, mangrove and pampas also occur.

(c) This adjoins kanuka/manuka shrubland 3-4 m tall with gorse locally frequent. Mamaku, tobacco weed, brush and black wattle are also present.

Significant flora

Astelia grandis (Regionally significant species).



Paparore Wetland & Shrubland O04/220

Each grid is 1000m x 1000m
and = 100 ha.

- S = shrubland
- F = forest
- W = wetland
- E = estuarine
- D = duneland



Fauna

Birds: Australasian bittern (Category O threatened species), NI fernbird and potential habitat for spotless crakes (Regionally significant species).

Aquatic fauna: 1999 record of black mudfish (Category C threatened species), giant bully (Regionally significant species) and short-finned eel.

Significance

One of the few remaining wetland and shrubland associations on the Rangaunu Harbour.

The peat swamp is a good example of a habitat type now uncommon in the Ecological Region.

Provides important habitat for wetland fauna including threatened species.

WAIPARERA CREEK WETLAND

Survey no.	O04/221
Survey date	23 August 1995
Grid reference	N04 303 965 (contiguous site on two maps), O04 306 964
Area	22.5 ha
Altitude	0-5 m asl

Ecological unit

- (a) Oioi saltmarsh on estuary
- (b) Raupo reedland in swamp
- (c) Manuka swamp-shrubland on alluvium
- (d) *Coprosma* spp.-giant umbrella sedge association on alluvium
- (e) Gorse-pampas-wattle scrub association on stop bank

Landform/geology

Freshwater wetland at head of Waiparera Creek estuary.

Vegetation

- (a) The saltmarsh is primarily oioi with sea rush, *Baumea juncea*, saltmarsh ribbonwood, *Selliera radicans* and glasswort.
- (b) This grades into a raupo dominant swamp with *Baumea articulata*. In some areas manuka and harakeke are common with pampas and wattle also occurring.
- (c) On slightly drier ground manuka is dominant with harakeke and *Baumea juncea*. Umbrella fern is also present. Elsewhere is a mosaic of manuka, wattle, harakeke, raupo, *Baumea juncea* and swamp millet.
- (d) There is also an area where *Coprosma propinqua*, *C. tenuicaulis* and giant umbrella sedge are common.
- (e) On the western riverbank, gorse, pampas and wattle are common. Upstream of the road bridge the area is trampled by stock.

Fauna

Birds: Spotless crane and NI fernbird (both Regionally significant species).



Waiparera Creek Wetland O04/221

Each grid is 1000m x 1000m
and = 100 ha.

- S = shrubland
- F = forest
- W = wetland
- E = estuarine
- D = duneland

Significance

One of the few freshwater wetland areas remaining on the margin of the Rangaunu Harbour.

Representative site for type (a) oioi saltmarsh, type (b) raupo reedland, and type (d) *Coprosma* spp.-giant umbrella sedge association. Only record of type (d) in the Ecological District.

Provides important habitat for wetland fauna.

Approximately 8 ha or 35.5% of this site is protected including 7.4 ha Stewardship Land and 0.6 ha Marginal Strip administered by the Department of Conservation.

AWANUI RIVER FOREST REMNANTS

Survey no.	O04/222
Survey date	9 May 1995
Grid reference	O04 323 824, O04 313 785, O04 327 824, O04 314 783, O04 328 815, O04 333 777, O04 322 811, O04 315 775, O04 313 798, O04 315 774, O04 312 794, O04 316 772, O04 308 793, O04 315 771, O04 309 787, O04 315 770, O04 313 788, O04 322 770
Area	50.5 ha
Altitude	5-15 m asl

Ecological unit

- (a) Ti kouka-manuka shrubland on alluvium
- (b) Kanuka/manuka shrubland on alluvium
- (c) Secondary kahikatea forest on alluvium
- (d) Puriri forest on alluvium
- (e) Puriri-taraire forest on alluvium

Landform/geology

Alluvial flats along Awanui River Valley.

Vegetation

A number of small forest remnants comprising lowland broadleaf and kahikatea forest and ti kouka shrubland. Most of the remnants are puriri dominant with taraire commonly occurring; others are kahikatea dominant.

Other species present are kowhai, titoki, miro, karaka, nikau, and matai.

Some of the sites are extremely small. Most are grazed, with no understorey.

Significant flora

One of the protected remnants (Foleys Bush) contains several threatened plants *Christella* aff. *dentata* (Taxonomically Indeterminate-Critically Endangered), *Pittosporum obcordatum* (Recovering-Conservation Dependent), *Mazus novaezeelandiae* subsp. *impolitus* f. *hirtus* (Endangered) and Regionally significant species, *Adelopetalum tuberculatum*, black maire and pokaka. Several native orchids have been identified in the bush.

Fauna

Birds: Kukupa (Category B threatened species), Australasian bittern (Category O threatened species).

Aquatic fauna: 1999 record of black mudfish (Category C threatened species) from the Awanui River swamp, giant bully (Regionally significant species), and short-finned eel.

Significance

Remnants of once widespread but now rare lowland broadleaf forest on alluvium supporting threatened flora and fauna. Virtually the only example of this type remaining in the Ecological Region and in the Far North generally.

One of the few sites in the Ecological District containing kukupa.

A representative site for all Ecological units, with three units unrecorded elsewhere in the Ecological District: ti kouka-manuka shrubland, kahikatea forest, and puriri forest.

Two areas of Scenic Reserve (O03 315 770, O03 327 824) of approximately 3 ha administered by the Department of Conservation and two Queen Elizabeth II National Trust Open Space Covenants (O04 333 777, O04 322 811) totalling 10.4 ha protect 26.5% of this site.

WEST COAST RD SHRUBLAND

Survey no. O04/223
Survey date 9 August 1995, 11 August 1995, October 2000
Grid reference O04 302 873, O04 306 872, O04 304 871, O04 304 866
Area 21.8 ha (16.7 ha shrubland, 5.1 ha wetland)
Altitude 5-20 m asl

Ecological unit

- (a) *Eleocharis sphacelata*-manuka association in dune hollow
- (b) Manuka shrubland on peat and gently sloping consolidated dunes
- (c) Wattle shrubland on peat
- (d) *Baumea* spp. on peaty dune hollow
- (e) *Baumea juncea*-manuka association in peaty dune hollow
- (f) Sydney golden wattle shrubland on gently sloping consolidated dunes

Landform/geology

Pleistocene consolidated parabolic dunes with freshwater wetland in interdune hollow.

Vegetation

(a) The small wetland in the very north of the site is predominately *Eleocharis sphacelata* with manuka.

(b) South-east of this, two small gumland areas are dominated by manuka and in the drier areas, type (c) Wattle shrubland occurs.

Wet boggy areas are dominated by *Baumea* spp., type (d), with occasional *Gleichenia dicarpa*.

Turutu is widespread throughout both areas.

(e) A small peat wetland on the corner of West Coast Rd is *Baumea juncea* and low manuka.

Kanuka, Sydney golden wattle and pampas are also present.

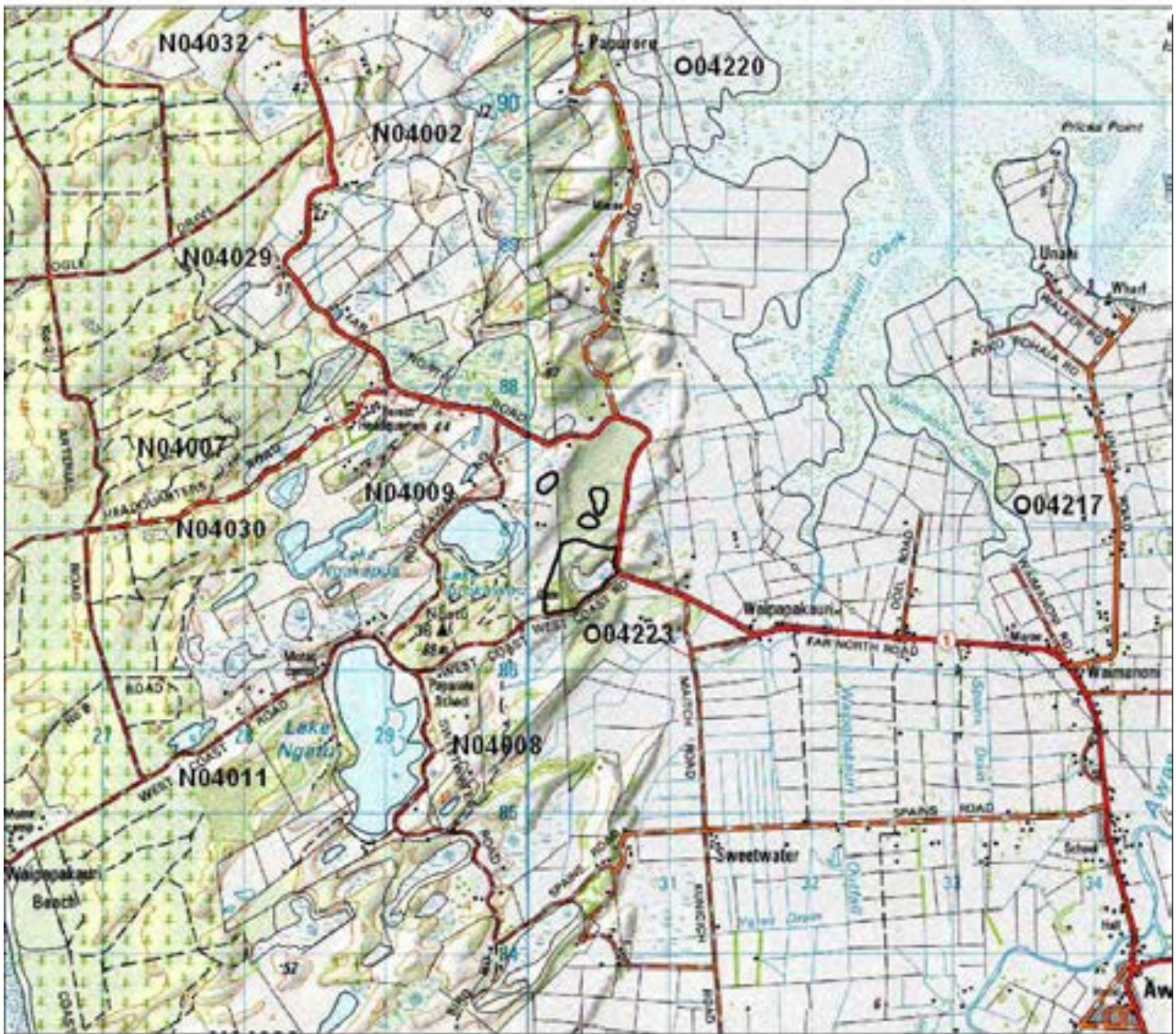
On the margins is low manuka shrubland, type (b), and type (f) Sydney golden wattle to 3 m in which prickly hakea and kanuka occur frequently. There is also an occasional emergent pine.

Significant flora

Thelymitra malvina (Naturally Uncommon-Sparse) and *T. carnea* were recorded from this site in year 2000.

Fauna

Birds: NI fernbird (Regionally significant species).



West Coast Rd Shrubland O04/223

Each grid is 1000m x 1000m
and = 100 ha.

- S = shrubland
- F = forest
- W = wetland
- E = estuarine
- D = duneland



Significance

The peat swamp is one of the few remaining examples of this habitat type and is a representative site for *Baumea juncea*-manuka association.

This area contains the regionally significant NI fernbird, and a threatened orchid. Also potential habitat for the threatened black mudfish.

Ecological unit

Kahikatea-kanuka secondary forest on alluvium

Landform/geology

Alluvial flats near mouth of Mangatete River.

Vegetation

Kanuka to 6 m and emergent kahikatea are co-dominant in a discontinuous canopy along a narrow strip of riverbank.

Willow and totara occur frequently, with ti kouka, puriri and brush wattle also present.

Fauna

Not surveyed.

Significance

A small pocket of regenerating riverine forest. Although unfenced and grazed it is important due to the lack of this habitat type in the Ecological Region. A representative site and the only record of kahikatea-kanuka forest in the Ecological District.

LAKE OHIA

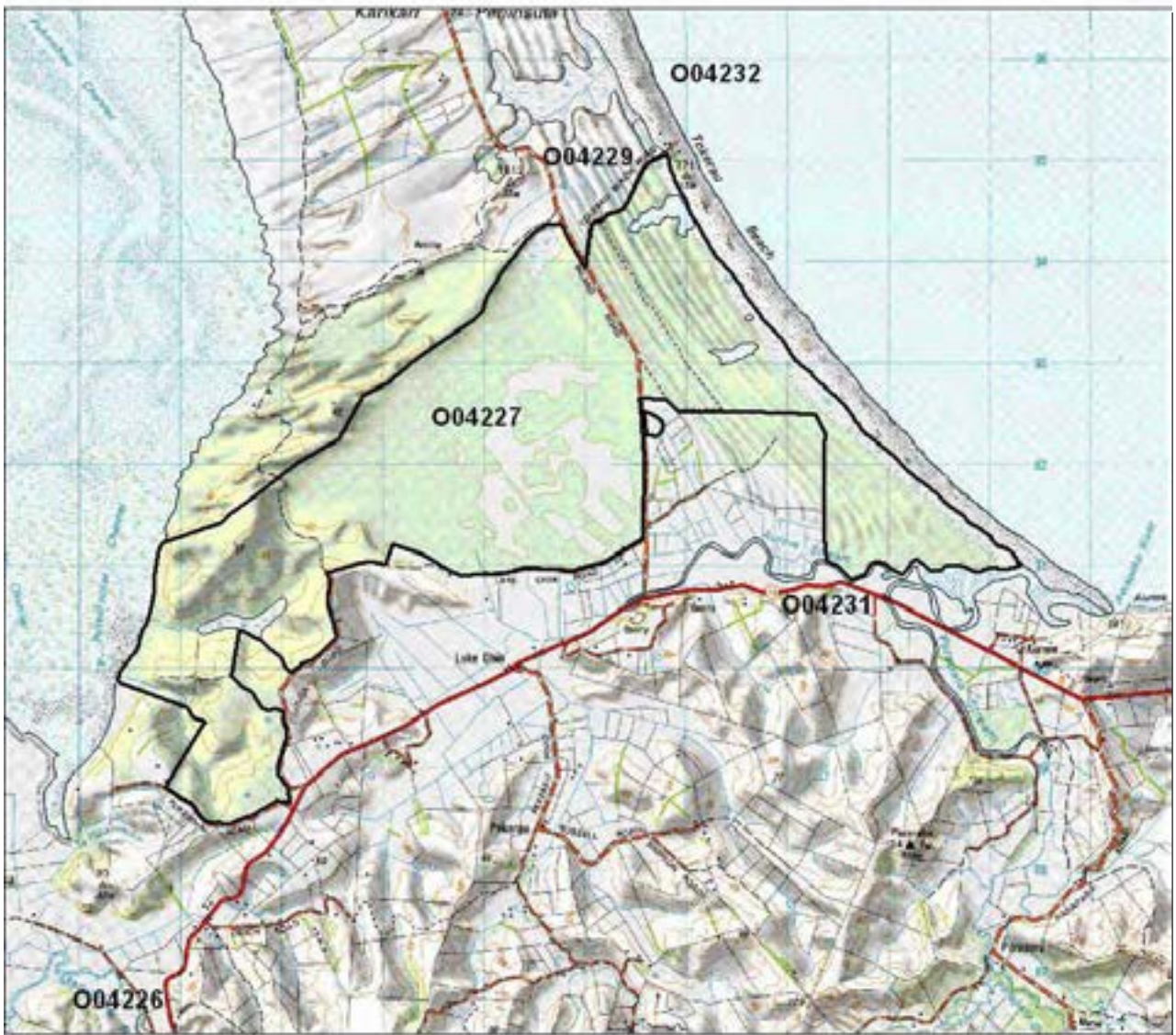
Survey no.	O04/227
Survey date	11 August 1995
Grid reference	O04 445 920
Area	1,641 ha (1,613 ha shrubland, 28 ha wetland)
Altitude	0-67 m asl

Ecological unit

- (a) Manuka-kanuka shrubland on peat bed
- (b) *Baumea juncea* sedgeland on peat bed
- (c) *B. buttonii* sedgeland on peat bed
- (d) Manuka-kanuka shrubland on dune ridges
- (e) Umbrella fern-*Schoenus* sp. association on gently sloping gumland
- (f) Manuka-*Schoenus brevifolius* association on dune ridges
- (g) *Lepidosperma filiforme* sedgeland on gently sloping gumland
- (h) *Schoenus brevifolius* sedgeland on peat beds
- (i) Raupo reedland in dune hollow
- (j) Wire rush rushland on peat bed
- (k) Manuka-kanuka shrubland on sand ridge

Landform/geology

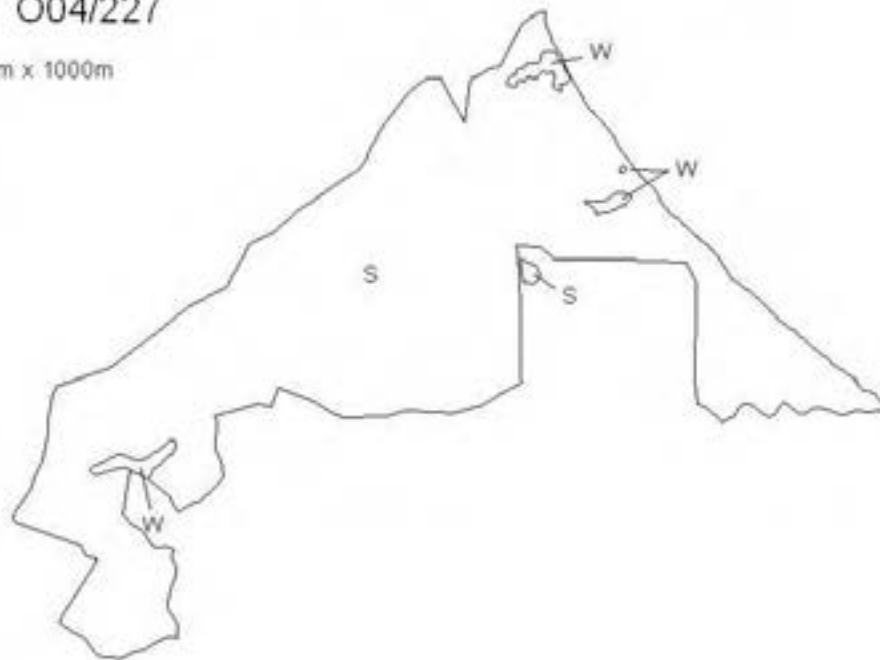
Freshwater wetland (formerly a shallow lake) on interdune flats ponded between a belt of consolidated foredunes of last interglacial age to the east, and Pleistocene consolidated parabolic dunes to the west.



Lake Ohia O04/227

Each grid is 1000m x 1000m
and = 100 ha.

- S = shrubland
- F = forest
- W = wetland
- E = estuarine
- D = duneland



Soils

Organic soil (Ruakaka Otonga), gley soil (Waipu Te-Kopuru), yellow-brown sand (Ohia), brown granular clay (Bream Te-Kie), yellow-brown earth (Tangitiki).

Vegetation

The lake bed contains well preserved sub-fossil kauri and silver pine, 30,000–40,000 years old (Clunie 1987), forming a mosaic with hard sand pans and patches of sedges and manuka “islands”. The area is seasonally wet and contains natural and man-made bog-holes.

(a) Within the old lake bed there are islands where manuka is dominant and kanuka common over dense swards of *Schoenus brevifolius* and *Baumea teretifolia*. Prickly hakea and mingimingi are less common. Bracken, kumarahou, *Dracophyllum lessonianum*, wattle, and gorse are also present with a ground cover of *Lycopodium* sp., *Lepidosperma filiforme* and adventive native herbs.

(b) In the west and north of the lake bed are dense, pure stands of *Baumea juncea* and *Baumea buttonii* type (c), which is more widespread. On slightly raised ground in the central and eastern sectors, the vegetation is open with *Eleocharis sphacelata* on the flats and sea rush and ring fern on mounds.

(d) On low sand ridges on the eastern side of the lake, manuka is dominant with locally occurring kanuka, *Dracophyllum lessonianum*, mingimingi, prickly hakea, scattered gorse, bracken and *Schoenus brevifolius*. Oioi occurs locally on low sandy ridge crests.

(e) On peaty gumlands, on the edges of the lake bed *Schoenus brevifolius* is locally dominant with umbrella fern, scattered low manuka and *Baumea teretifolia*. *Baumea juncea* and *B. rubiginosa* occur on drier areas. *Gonocarpus micranthus* and *Lycopodiella lateralis* are widespread and *Sphagnum* is abundant. *Spiranthes novae-zelandiae* and *Cryptostylus subulata* are present. *Baumea rubiginosa* and wire rush are locally abundant on old gum diggings. The threatened fern *Todea barbara* is present.

(f) In the south-western sector sandy ridges rising to 70 m asl form a corridor linking Lake Ohia to Rangaunu Harbour. A mosaic of low manuka shrubland and *Schoenus brevifolius* occurs with scattered *Dracophyllum lessonianum*, *Lepidosperma filiforme*, *Epacris pauciflora*, *Lycopodiella lateralis*, mingimingi, kumarahou and *Pomaderris phyllicifolia*. In depressions manuka is dense and co-dominant with *Schoenus brevifolius* and on the lower slopes, *Baumea teretifolia*. On the basal slope are found *Schoenus brevifolius* and *Baumea teretifolia* with umbrella fern, frequent manuka, turutu, *Lycopodium* sp. and bracken.

(g) Sedgeland dominated by *Lepidosperma filiforme* occurs towards the Rangaunu Harbour. *Epacris pauciflora*, *Baumea* sp. and *Schoenus* sp. are also present. Hakea is locally frequent.

On the margins and some ridge crests Sydney golden wattle is locally abundant and some pines are planted on the perimeter.

(h) In the eastern sector near Tokerau Beach, peaty hollows are dominated by *Schoenus brevifolius* with occasional *Baumea teretifolia*. Low manuka is widespread. Wire rush and umbrella fern are locally common.

(i) Behind the dunes, raupo is local with a narrow fringe of harakeke and occasional ti kouka.

The northern lake has harakeke and pohutukawa scattered on its banks.

(j) Wire rush is abundant with local stands of kuta, *Eleocharis sphacelata*, *Baumea juncea*, *B. rubiginosa*, raupo and jointed rush. *Myriophyllum propinquum* is locally common.

On drier ground open sedgeland of type (h) *Schoenus brevifolius* is dominant with manuka, kanuka, mingimingi and kumarahou. Prickly hakea is widespread.

(k) The low sand ridges have a discontinuous canopy of manuka-kanuka 2–3 m tall with mingimingi, kumarahou, gorse, prickly hakea, Sydney golden wattle and occasional *Dracophyllum lessonianum* and *Epacris pauciflora*. *Schoenus brevifolius* is scattered throughout with *Lepidosperma filiforme*, *Lycopodium deuterodensum*, *Cyathodes fraseri* locally plentiful and occasional turutu, *Morelotia* sp. and *Pimelea* c.f. *urvilleana* “northern”.

Significant flora

Endangered

Phylloglossum drummondii (1999 record).

Vulnerable

Todea barbara, *Lycopodiella serpentina* and *Thelypteris confluens*.

Naturally Uncommon–Range Restricted

Cryptostylis subulata and *Thelymitra malvina*.

Naturally Uncommon–Sparse

Calochilus paludosus

Taxonomically Indeterminate–Critically Endangered

Calochilus aff. *herbaceus*.

Taxonomically Indeterminate–Endangered

Thelymitra (a) (translocated).

Regionally significant species

Thelymitra “darkie” AK 231761, wire rush and *Utricularia delicatula*.

1968 record of *Pimelea arenaria* (Declining).

Fauna

Birds: Northern NZ dotterel (Category B threatened species), banded dotterel (Category C threatened species), Australasian bittern (Category O threatened species). High numbers of NI fernbird and spotless crane (both Regionally significant species). Other bird fauna include trans-equatorial migrants, e.g. greenshank, Pacific golden plover, sharp-tailed sandpiper and turnstone.

Aquatic fauna: 1993 record of black mudfish (Category C threatened species), long-finned eel, common bully and inanga.

Lizards: 1980 record of copper skink.

Significance

Outstanding habitat which is the last vestiges of heath and boglands on old sand country on the Karikari Peninsula forming a continuous sequence from the eastern shoreline of Rangaunu Harbour through to Tokerau Beach, Doubtless Bay.

NI fernbird population is one of the largest in the Ecological District (R.J. Pierce pers. comm.).

Representative site for type (a) manuka-kanuka shrubland on peat bed, type (b) *Baumea juncea*, and (c) *B. buttonii* sedgeland, (e) umbrella fern-*Schoenus* sp. association, (f) manuka-*Schoenus brevifolius* association, (g) *Lepidosperma filiforme* sedgeland, (h) *Schoenus brevifolius* sedgeland, (j) wire rush sedgeland, and type (k) manuka-kanuka on sand ridge. Sole record of type (c), (g), (h) and (j) in the Ecological District.

A geopreservation site for:

- Lake Ohia gundigging holes which are one of the best preserved groups in New Zealand and are ranked as being nationally significant.
- Lake Ohia Pleistocene fossil forest dating back 30,000 years. Partly exhumed buried Quaternary kauri forest of regional significance.
- Lake Ohia Quarry pyrite: Egg sized pyrite nodules in shale of regional significance.

(Kenny & Hayward 1996)

The site is also nationally important because of its soils:

- It comprises an extensive area containing a wide range of soils and soil-vegetation associations.
- It is the only example of Waipu and Ohia soils in the national inventory.
- It contains good examples of Otonga soils which are uncommon.
- Most Waipu soils have been developed for farming.

(Arand et al. 1993)

The majority of this site is protected, 76%, by 1,234 ha of Stewardship Land and 29 ha of Marginal Strip both administered by the Department of Conservation.

References: Anderson (1985); Clunie (1987).

LAKE WAIPOROHITA

Survey no.	O04/228
Survey date	22 August 1995
Grid reference	O04 428 300
Area	8.3 ha (1.7 ha shrubland, 6.6 ha wetland)
Altitude	5-15 m asl

Ecological unit

- (a) Open water in dune lake
- (b) *Eleocharis sphacelata*-raupo reedland on lake bed

Landform/geology

Lake on interdune flat behind belt of consolidated foredunes of last interglacial age.

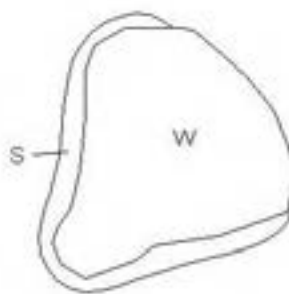
Vegetation

- (a) This lake is 90% open water.
- (b) On the margins *Eleocharis sphacelata* is dominant and raupo common. *Baumea articulata* with smaller *Juncus* sp., jointed rush and willow weed are also present. A fringe of manuka, with frequent pohutukawa, poplar (planted),



Lake Waiporohita O04/228

- Each grid is 1000m x 1000m and = 100 ha.
- S = shrubland
- F = forest
- W = wetland
- E = estuarine
- D = duneland



gorse, kanuka, bracken, tobacco weed, pampas and brush wattle are also present.

Significant flora

Amphibromus fluitans (Critically Endangered) sighted by Heenan and de Lange in 1998 (P.J. de Lange pers. comm. 2000) and *Gratiola pedunculata* (Naturally Uncommon-Vagrant) recorded in 1996 by de Lange.

Fauna

Birds: NZ dabchick (Category C threatened species), Caspian tern and Australasian bittern (both Category O threatened species), common waterbirds and some rare visitors, e.g. white-winged black tern.

Aquatic fauna: common bully.

Frogs: The green frog (*Litoria aurea*) was recorded from this lake in 1986.

Significance

Small freshwater lake habitat for threatened and common waterbirds. Potential habitat for spotless crake (Regionally significant species).

Unfortunately the pest fish *Gambusia* was recorded from the lake in 1993.

Lake Waiporohita is a protected Scenic Reserve (97.5%), administered by the Department of Conservation.

SOUTHERN TOKERAU SWAMP

Survey no.	O04/229
Survey date	21 August 1995
Grid reference	O04 448 956, O04 440 950
Area	84 ha (73 ha shrubland, 11 ha wetland)
Altitude	5-10 m asl

Ecological unit

- (a) Manuka swamp-shrubland on dunes
- (b) Harakeke-raupo reedland in dune hollow

Landform/geology

Freshwater wetland ponded by Holocene foredunes.

Vegetation

- (a) Peat bog with some fertile areas adjoining beach dunes.

Within the manuka shrubland, gorse and prickly hakea are locally common or frequent over *Baumea* sp. sedge. Ti kouka, mamaku, bracken, pampas, brush wattle and pine also occur in the canopy and *Schoenus* sp., wire rush, tututu, umbrella fern, *Lycopodium* sp. and sundews are also present.

- (b) In more fertile sites adjoining the dunes harakeke, raupo and willow weed are found.

Significant flora

Threatened plants including *Lycopodiella serpentina* (Vulnerable), *Todea barbara* (Vulnerable) and wire rush (Regionally significant species) are present and a large population of *Cyclosorus interruptus* (Declining) was recorded in 1979 by Bartlett.

Fauna

Birds: NI fernbird and potential habitat for spotless crake (both Regionally significant species), NZ pipit and potential habitat for Australasian bittern (Category O threatened species).

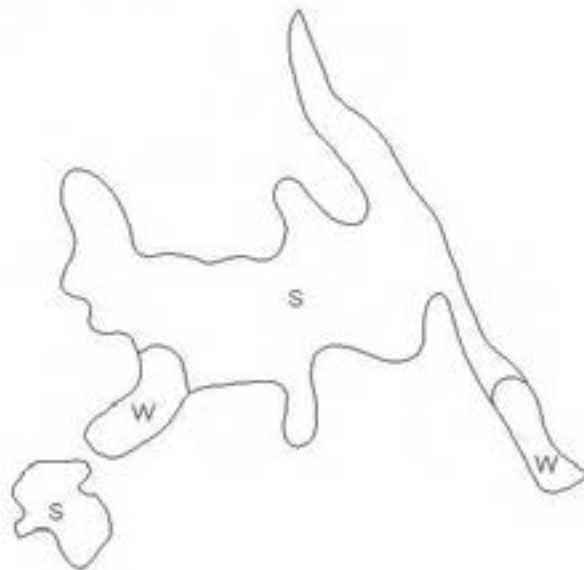
Aquatic fauna: giant bully (Regionally significant species).



Southern Tokerau Swamp O04/229

Each grid is 1000m x 1000m
and = 100 ha.

- S = shrubland
- F = forest
- W = wetland
- E = estuarine
- D = duneland



Significance

This wetland adjoins Tokerau Beach and is contiguous with the Lake Ohia complex. It is an example of a nationally threatened habitat type and contains threatened and regionally significant species.

Representative site for both Ecological units recorded at this site.

Stewardship Land administered by the Department of Conservation protects approximately 66.8 ha or 79.5% of this site.

NORTHERN TOKERAU SWAMP

Survey no. O04/230
Survey date 21 August 1995
Grid reference O04 441 989
Area 71 ha
Altitude 1-10 m asl

Ecological unit

- (a) Open water
- (b) Raupo reedland in peaty dune hollow

Landform/geology

Freshwater wetland ponded by Holocene foredunes.

Vegetation

- (a) A very small area is open water.
- (b) Almost all of the area is a raupo swamp with *Baumea* sp., *Carex virgata*, *Eleocharis acuta*, willow weed, pampas, gorse, harakeke, mamaku, and sporadic to clumped manuka.

Significant flora

The Vulnerable fern *Thelypteris confluens* has been recorded from two locations at this site and in 1967 Rawlings recorded *Lycopodiella serpentina* (Vulnerable).

Fauna

Birds: Australasian bittern (Category O threatened species), NI fernbird and potential habitat for spotless crane (both Regionally significant species).

Significance

A mineralised swamp on peat adjoining Tokerau Beach supporting threatened species and an example of an uncommon habitat type. The fertility of this area may have been in some part induced by run-off from adjoining farmland, as it was formerly semi-fertile. Representative site for raupo reedland.

The swamp is protected Stewardship Land, 68.4 ha or 96.3% of the site and is administered by the Department of Conservation.



Northern Tokerau Swamp O04/230

Each grid is 1000m x 1000m
and = 100 ha.

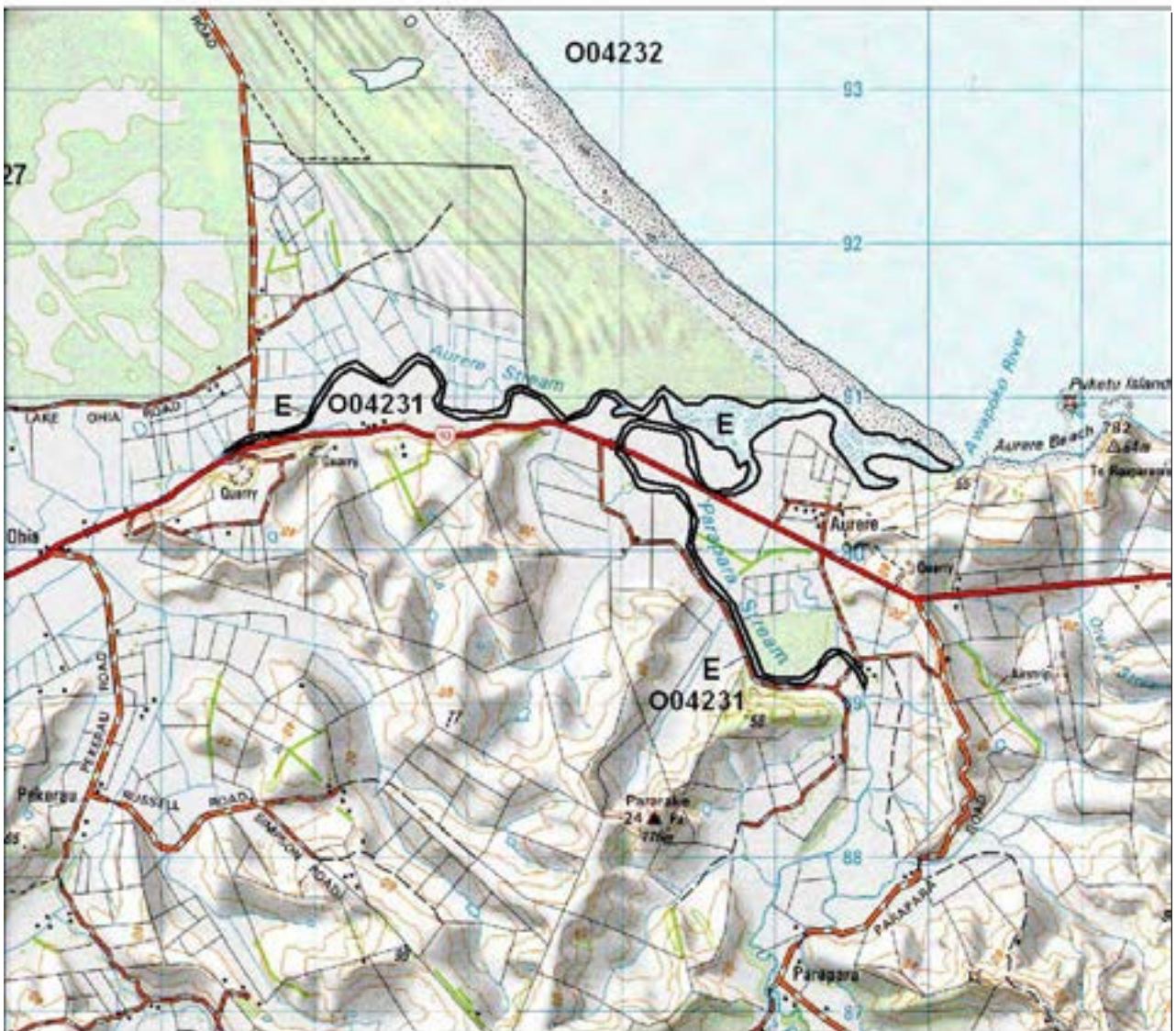
- S = shrubland
- F = forest
- W = wetland
- E = estuarine
- D = duneland

AWAPOKO ESTUARY

Survey no. O04/231
 Survey date 21 August 1995
 Grid reference O04 486 907
 Area 65 ha
 Altitude 0-15 m asl

Ecological unit

- (a) Mangroves on estuary
- (b) Sea rush saltmarsh on estuary



Awapoko Estuary O04/231

Each grid is 1000m x 1000m
and = 100 ha.

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

Landform/geology

Rivermouth estuary.

Vegetation

(a) Mangroves line this small estuary with mudflats, bordered by sand dunes and farmland, and with a sandspit at the river mouth.

(b) Sea rush is common with oioi occurring occasionally. Glasswort, saltmarsh ribbonwood, harakeke, ti kouka, kanuka, raupo and a variety of exotic species occur scattered along the margins.

Fauna

Birds: Northern NZ dotterel (Category B threatened species), variable oystercatcher, banded dotterel and white-fronted tern (all Category C threatened species), Caspian tern, white heron and reef heron (all Category O threatened species) and potential habitat for banded rails (Regionally significant species).

Significance

A small estuarine area extending approximately 4-5 km inland from Tokerau Beach, with good bird diversity including seven threatened species.

A representative site, and the only record of sea rush saltmarsh in the Ecological District.

TOKERAU BEACH

Survey no.	O04/232
Survey date	21 August 1995
Grid reference	O04 465 944
Area	376 ha
Altitude	0-13 m asl

Ecological unit

- (a) *Spinifex* grassland on dunes
- (b) Knobby clubrush sedgeland on dunes

Landform/geology

Sandy beach backed by belt of Holocene foredunes.

Vegetation

(a) A long narrow strip of dunes with vegetation of varying density. *Spinifex* dominates the foredune. Bare sand, middens and tauhinu are common. Pingao occurs frequently. Also present are marram, toetoe, *Pimelea arenaria*, pampas, harakeke, native iceplant, Cape honey flower and boneseed.

(b) On the stabilised dunes, knobby clubrush is common. Harakeke, *Spinifex*, pohuehue, *Coprosma acerosa*, pampas, kikuyu, and buffalo grass are frequent. Other species present are tauhinu, *Pimelea* sp., NZ spinach, lupin, apple of Sodom, pine, Norfolk pine, gorse, Cape honey flower and wild gladiolus.

Significant flora

1999 record *Pimelea arenaria* (Declining).

Pingao (Recovering-Conservation Dependent).

Fauna

Birds: Northern NZ dotterel (Category B threatened species), variable oystercatcher (Category C threatened species), Caspian tern (Category O threatened species), NZ pipit, Australasian gannet.

Snails: Archey's dune snail (Serious Decline).

Aquatic fauna: Giant bully (Regionally significant species), common bully, long-finned eel.

Lizards: 2000 record of shore skink.



Tokerau Beach O04/232

Each grid is 1000m x 1000m
and = 100 ha.

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

Marine reptiles: 1985 record of yellow-bellied snake. 1990 record of leathery turtle.

Significance

A long east coast beach system providing habitat for breeding northern NZ dotterel and other threatened species.

Representative site for knobby clubrush sedgeland.

Two separate Stewardship Land areas administered by the Department of Conservation protect approximately 225 ha or 59.8% of this site.

RANGAUNU HARBOUR

Survey no.	O04/233
Survey date	11 August 1995
Grid reference	O04 360 950
Area	10,185 ha
Altitude	<2 m asl

Ecological unit

- (a) Mangrove forest on estuary
- (b) Eelgrass beds on estuarine flats
- (c) Oioi-sea rush saltmarsh on estuary
- (d) Glasswort beds on estuary
- (e) Shellbanks

Landform/geology

Harbour with intertidal shellbanks, mud and sand flats.

Vegetation

(a) Mangrove areas are extensive (covering 27%, Shaw et al. 1990) throughout the middle and upper tidal flats. These support roosting and nesting shags and the margins are banded rail habitat.

(b) The eelgrass (*Zostera novazelandica*) beds cover extensive tidal flats (covering 19%, Shaw et al. 1990) in the lower and middle tidal zone and are high value habitat for many polychaetes and other marine organisms which waders and other birds and fish rely on for food.

Several pristine islands contain dense stands of rushes with emergent manuka, ti kouka, saltmarsh ribbonwood and *Hebe*.

(c) Oioi and sea rush are both common in salt marsh areas.

(d) On the margins glasswort may be locally abundant. NZ spinach is also present. Saltmarsh ribbonwood and manuka occur on higher ground.

(e) Shellbanks are nesting areas for Caspian tern, white-fronted tern, Northern NZ dotterel, variable oystercatcher and other species and they provide roosts for many other species.

Fauna

Over 60 species of wetland birds have been recorded from this harbour including northern NZ dotterel and wrybill (both Category B threatened species), variable oystercatcher, banded dotterel and white-fronted tern (all Category C threatened species), royal spoonbill, Caspian tern, reef heron, white heron, Australasian bittern (all Category O threatened species). Several trans-equatorial migratory waders utilise this habitat, including bar-tailed godwit, turnstone, whimbrel, lesser knot, eastern long-billed curlew, red-necked stint and eastern little terns.

The mangroves provide important habitat for banded rail (Regionally Significant species).

Lizards: 1978 record of Pacific gecko and shore skink.

Significance

A large harbour with extensive mangroves, shellbanks, sand flats, mudflats and islands which contains the largest mangrove area in New Zealand (Ogle 1984).

Mangroves in the harbour have increased by 33% from 1944 to 1981 probably reflecting infilling by sediments from land runoff (Shaw et al. 1990).

The Rangaunu Harbour provides an outstanding habitat for national and international migratory waders and is one of the most important bird sites in New Zealand.

The harbour and environs support some of the largest concentrations of species in New Zealand, e. g. banded dotterels (up to 1000 outside the breeding season), lesser knots (up to 10,000), pied stilts (few thousands) and eastern little terns (50-100).

Many species of waders feed and/or roost on pasture on Karikari Peninsula and the Lake Ohia pans, particularly during high tide periods (R.J. Pierce pers. comm.).

Representative site for the five Ecological units recorded at this site.

Rangaunu Harbour has been nominated for RAMSAR status as a wetland of international importance.

Threats to the harbour include habitat loss due to the establishment of marine farms and the spread of *Spartina*.

Approximately 97.83 ha are protected within this site including, 36 ha of Stewardship Land, 53 ha of Marginal Strip, 7.83 ha of Nature Reserve, and 1 ha of Historic Reserve all administered by the Department of Conservation.

WALKER ISLAND

Survey no.	O04/235
Survey date	1992
Grid reference	O04 375 993, O04 274 987
Area	26.5 ha
Altitude	< 5 m asl

Ecological unit

- (a) *Spinifex* grassland on shell bank
- (b) *Pimelea arenaria*-*Spinifex* association on shell bank

Landform/geology

Shell banks in Rangaunu Harbour.

Vegetation

Spinifex and *Pimelea arenaria* are the dominant species with pingao, knobby clubbrush, exotic grasses and herbs.

Significant flora

Pimelea arenaria (Declining) and pingao (Recovering-Conservation Dependent).

Fauna

Birds: Breeding site for northern NZ dotterel (Category B threatened species), white-fronted tern and variable oystercatcher (both Category C threatened species), Caspian tern and reef heron (both Category O threatened species), red-billed gull and southern black-backed gull. Roost site for bar-tailed godwit, lesser knot, little tern, turnstone, SI pied oystercatcher and many other species all regularly use this site.

Lizards: 1992 record of shore skink.



Walker Island O04/235

Each grid is 1000m x 1000m
and = 100 ha.

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

Significance

Major roost site for up to 10,000 waders (and additional terns and gulls) in the Rangaunu Harbour including migratory species and breeding site for several threatened species.

The only breeding and roosting site at Rangaunu Harbour that is virtually safe from mammalian predator pressure.

Representative site and the only record of *Spinifex* grassland and *Pimelea arenaria-Spinifex* association on island habitats in this Ecological District.

The northern island is Nature Reserve of 7.1 ha administered by the Department of Conservation protecting 26.7% of this site.