

(d) Near the Rarawa trig the shrubland is kanuka-manuka wattle. This type is also found near type (g).

(e) A raupo swamp with occasional harakeke also occurs here.

(f) Low manuka to two metres contains scattered *Dracophyllum lessonianum*, wattle, *Callistachys lanceolata*, mingimingi and patches of bare sand.

(g) On steep coastal faces on the margins of type (f) are small pockets of pohutukawa with houpara, *Coprosma* species, *Cyathodes juniperina* and kowharawhara.

(h) Coastal association of abundant manuka with harakeke and hangehange occurs in about 20% of the area.

Significant flora

At least 7 species of native orchids are present including *Thelymitra* "rough leaf" AK 229531 (Regionally significant species) which is confined to upper Northland.

Astelia grandis (Regionally significant species).

Fauna

Lizards: Northland green gecko (Regionally significant species).

Aquatic fauna: Banded kokopu (Category C threatened species) and red-finned bully.

Significance

Contains several uncommon coastal habitat types, and this particular area displays a diversity of native orchid species. Type (c) harakeke association, type (g) pohutukawa forest, and type (h) manuka-harakeke association, are representative vegetation types, with type (c) harakeke association unrecorded elsewhere on the mainland in the Ecological District.

Additional surveying is recommended to determine further ecological significance of this site.

GREAT EXHIBITION BAY

Survey no.	N03/015
Survey date	28 August 1995
Grid reference	N03 137 270
Area	755 ha
Altitude	0-43 m asl

Ecological unit

(a) Sandfield

(b) Marram-*Spinifex* grassland on upper dunes

Landform/geology

Holocene coastal dunes.



Great Exhibition Bay N03/015

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

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

Vegetation

Marram and *Spinifex* are common with frequent toetoe and oioi. Also present are manuka, kanuka, pine, tauhinu, Sydney golden wattle, *Callistachys lanceolata* and bracken.

Significant flora

Esler recorded the threatened *Euphorbia glauca* (Declining) amongst *Spinifex* near Wairahi Stream in 1974.

Fauna

Birds: Northern NZ dotterel (Category B threatened species), variable oystercatcher (Category C threatened species), white-fronted tern (Category C

threatened species), and common coastal bird species were recorded by the OSNZ in early 2000. NZ pipit have also been recorded from this site.

Snails: Unconfirmed record of Archey's dune snail (Serious Decline) (F. Brook pers. comm.).

Significance

A good example and representative site of a nationally uncommon habitat type, (type a), with limited modification.

Further fauna survey is recommended.

Stewardship land, 271 ha, administered by the Department of Conservation protects 35.8% of this site.

HENDERSON BAY & KOWHAI BEACH

Survey no.	N03/016
Survey date	14 August 1995
Grid reference	N03 235 150
Area	410 ha (401 ha duneland, 9 ha shrubland)
Altitude	0-20 m asl

Ecological unit

- (a) *Spinifex* grassland on foredunes
- (b) Pingao sedgeland on foredunes
- (c) Wattle shrubland on dunes
- (d) Sandfield

Landform/geology

Holocene dunes overlying Pleistocene leached consolidated sand.

Vegetation

(a) At Henderson Bay, *Spinifex* is common. Pingao, pohutukawa, kanuka/manuka, harakeke, knobby clubrush, *Coprosma acerosa*, oioi, lupin, Norfolk pine, macrocarpa, marram, Sydney golden wattle and pampas also occur.

(b) South of this, at Kowhai Beach, pingao is common on the foredune and *Spinifex* less so. Marram is present with wattle and sedges. Manuka, kanuka, toetoe, *tauhinu*, and pampas all occur sparsely.

(c) On the inland side of the sandfield wattle is common. Marram is frequent. Other species present are pohutukawa, toetoe, manuka, kanuka, *Coprosma acerosa*, oioi, knobby clubrush, rushes (*Juncus* spp.), pohuehue, and tauhinu. Pine, pampas and macrocarpa are occasional.

(f) Hard pans and stone flats are scattered throughout the sandfields.

Significant flora

Pingao (Recovering-Conservation Dependent). This site is being considered for translocation of the Critically Endangered *Atriplex hollowayi* from Te Paki Ecological District (L.J. Forester pers. comm.).

Fauna

Birds: Northern NZ dotterel (Category B threatened species), banded dotterel, variable oystercatcher (Category C threatened species), bar-tailed godwit,



Henderson Bay & Kowhai Bay N03/016

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

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



turnstone, lesser knot and white-faced heron were recorded in a year 2000 survey by the OSNZ. White-fronted tern (Category C threatened species), Caspian tern (Category O threatened species), whimbrel, Australasian gannet and pied shag have been recorded previously.

Significance

A thriving area of pingao and a very good example of a nationally threatened habitat type with limited modification. Representative site for type (b) pingao sedgeland and type (d) sandfield.

Kowhai Beach is a wildlife refuge supporting at least five threatened bird species and is an important roost site for waders including international migrants.

TE KAO SOUTH SWAMP

Survey no.	N03/018
Survey date	15 August 1995
Grid reference	N03 087 256, N03 107 248
Area	83 ha (9 ha shrubland, 74 ha wetland)
Altitude	25-40 m asl

Ecological unit

- (a) Open water (intermittent) in dune valley
- (b) Manuka-raupo swamp association in dune valley
- (c) Manuka shrubland on swamp margin and gentle slope
- (d) Wattle scrub on gentle slope
- (e) Raupo reedland in dune valley

Landform/geology

Freshwater wetland ponded between Pleistocene leached consolidated sand on true left and parabolic dunes on true right.

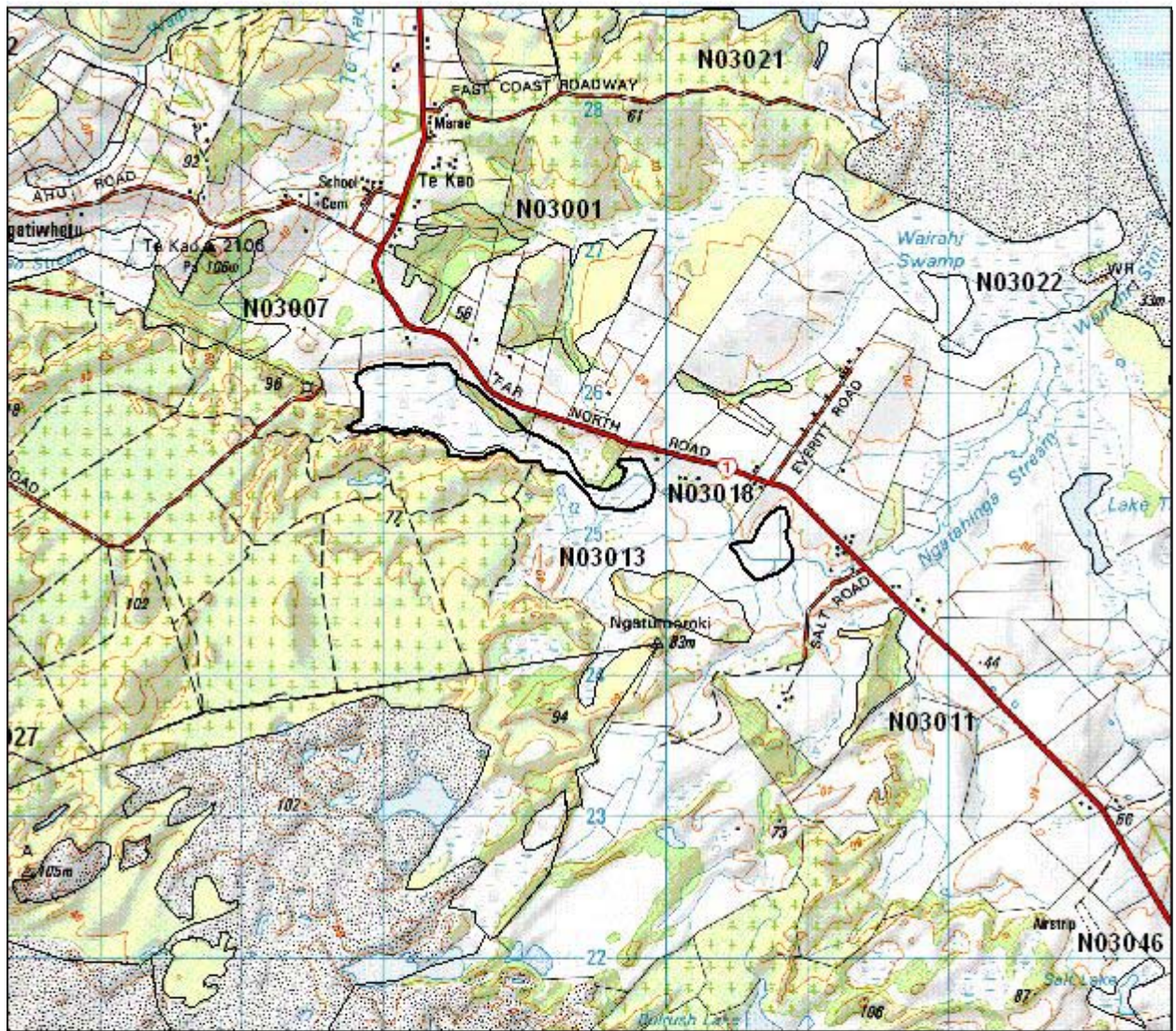
Vegetation

- (a) Open water may occur intermittently.
- (b) In the larger wetland manuka and raupo are common with harakeke less common.
- (c) The shrubland margin is discontinuous. Ti kouka, hangehange, pampas and *Cassytba* are also present.
- (d) There is also a small area of wattle (3%).
- (e) The smaller Ngatumoroki wetland is raupo dominant (100%) with frequent sedges and occasional harakeke and ti kouka.

These wetlands appear to be drier than formerly.

Fauna

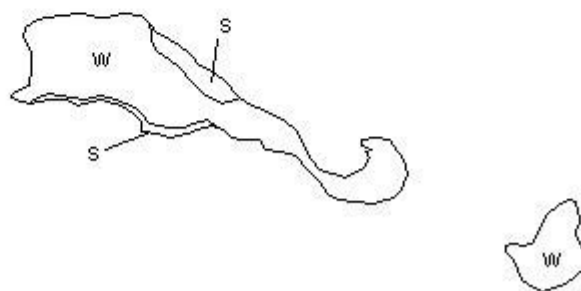
Birds: Australasian bittern (Category O threatened species), NZ shoveler. Little shag, grey duck, formerly present.



Te Kao South Swamp N03/018

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

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



Significance

A sizeable wetland habitat suitable for cryptic species such as Australasian bittern, NI fernbird and spotless crane. Representative site for manuka-raupo swamp association, type (b).

TE RAMANUKA LAKES & SHRUBLAND

Survey no.	N03/019
Survey date	14 August 1995
Grid reference	N03 135 207, N03 112 183, N03 128 202, N03 119 182
Area	423 ha (15 ha duneland, 398 ha shrubland, 10 ha wetland)
Altitude	60-110 m asl

Ecological unit

- (a) Kanuka shrubland on dunes
- (b) Sandfield
- (c) Wattle shrubland on dunes
- (d) *Baumea articulata-Eleocharis sphacelata* reedland in lake bed
- (e) *Isolepis* sp. sedgeland on sand flats
- (f) Raupo reedland in lake bed
- (g) Bracken fernland on sandy flats and knolls
- (h) Gorse scrub on dunes
- (i) Knobby clubrush-*Juncus* sp.-oioi association in lake bed

Landform/geology

Pleistocene consolidated parabolic dunes and late Holocene unconsolidated parabolic dunes with interdune sandy alluvial flats and freshwater wetlands/lakes.

Vegetation

Te Ramanuka Trig

- (a) About half of the area is kanuka shrubland between 3-5 m with occasional ti kouka, tobacco weed and wattle. Apart from small areas of gorse and wattle scrub, the remainder is 6 m tall kanuka.
- (b) To the west of Lake Half is a large sandfield with frequent toetoe and occasional wattle.
- (c) Near Lake Half, wattle is common in the stabilised sand, toetoe frequent and kanuka, bracken, pingao, lupin and *Coprosma acerosa* occur occasionally.

Significant flora

Pingao (Recovering-Conservation Dependent).

A suite of small lakes and wetlands are buffered by shrubland:

Eleocharis Lake

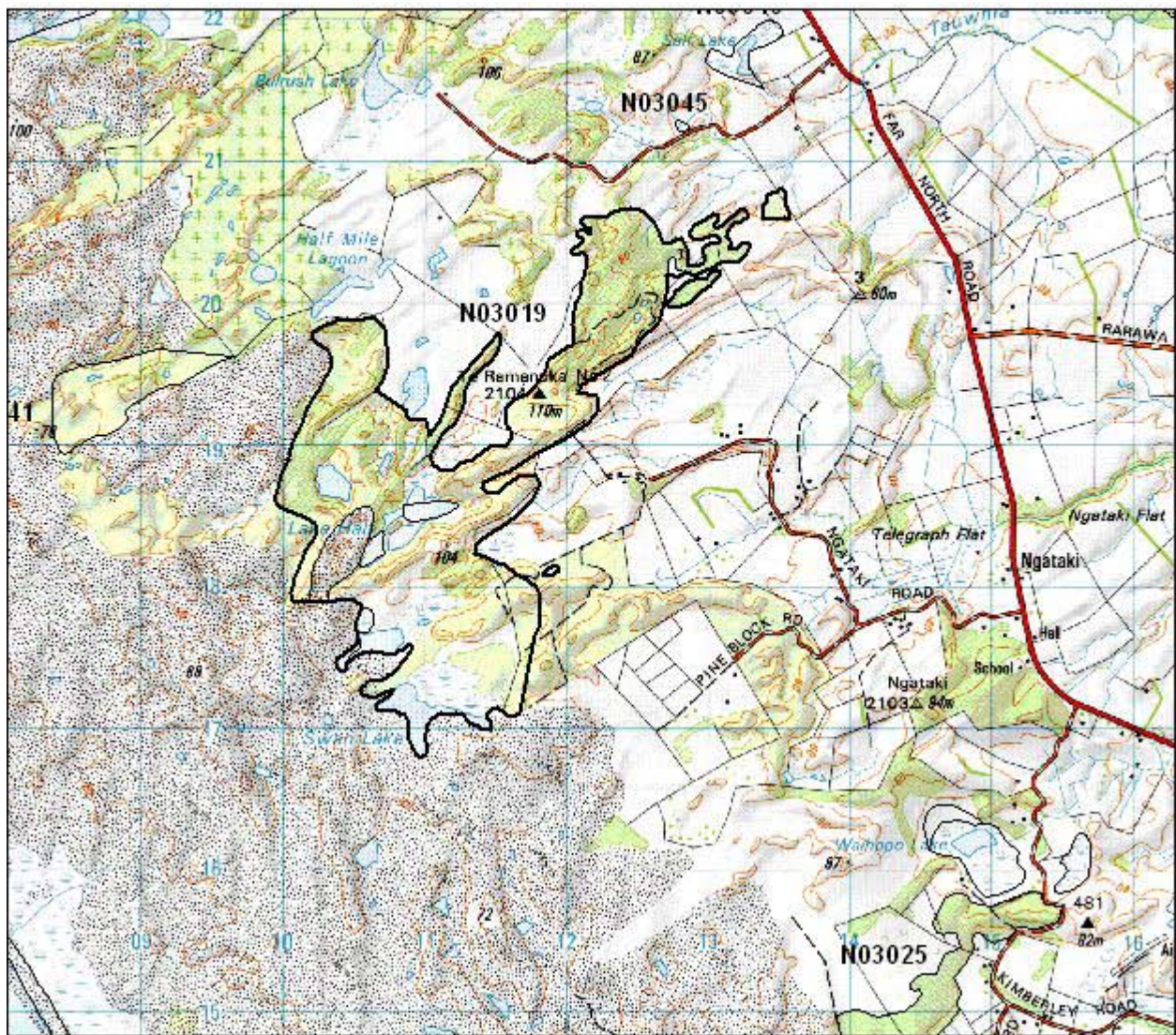
- (d) North-west of Lake Half is a wetland consisting of *Baumea articulata* and *Eleocharis sphacelata*.
- (e) 20% of the area is *Isolepis* sp. and small sedges.

Dabchick Lake

- (f) A short distance to the east is a small dune lake with an *Eleocharis* sp. fringe and raupo swamp. Although small, it is habitat for NZ dabchick and Australasian bittern.

Lake Half

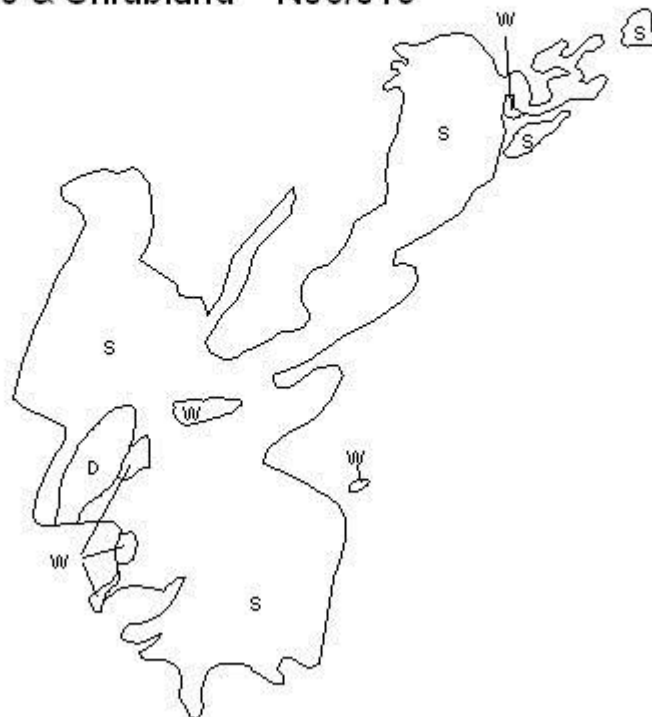
This lake appears to be drying out, being primarily (type f) raupo with small amounts of *Eleocharis sphacelata* and kuta.



Te Ramanuka Lakes & Shrubland N03/019

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

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



Shrubland adjoining the habitat is either type (a) kanuka 2-3 m tall with frequent toetoe, occasional mingimingi, hangehange, bracken and wattle, or type (c) wattle with frequent kanuka. Other species present are pohuehue, *Cassytba*, lupin, *Coprosma rhamnoides* and shining spleenwort.

(g) Bracken fernland occurs in former swampy areas and on knolls.

Significant flora

Thelypteris confluens (Vulnerable) is also found and *Cyclosorus interruptus* (Declining) was recorded from the east of the area in 1984.

Lake Wingy

(h) This has also dried out, with only two small wettish areas remaining. Weeds such as gorse, thistle, pampas and grass are invading. Only a small area of raupo, type (f), remains in which giant umbrella sedge and harakeke occasionally occur.

The surrounding vegetation is two-thirds gorse and one-third kanuka. Wattle is locally dominant.

Swan Lake

(i) This lake has also dried out to a primarily sedge/rushland of knobby clubrush, *Juncus* sp., oioi, *Baumea articulata*, and *Eleocharis* sp. Raupo, toetoe, kanuka, gorse, wattle, pampas and lupin are also present.

Significant flora

The threatened plant *Hydatella inconspicua* (Declining) has been recorded from here, and *Eleocharis neozelandica* (Declining) on damp sand flats with *Lilaeopsis novae-zelandiae* and *Myriophyllum* sp. (Bell 1985).

Fauna

NZ dabchick (Category C threatened species). NZ dabchick have declined and virtually disappeared from these lakes in recent years due to drying out (V. Hensley pers. comm.). Australasian bittern (Category O threatened species). NZ scaup, NI fernbird, spotless crane and Australasian little grebe (all regionally significant species). NZ shoveler, grey duck, little shag and little black shag are also present.

Significance

An important habitat for several threatened and regional significant animal species and several threatened plant species. The shrubland is one of the larger and better examples of its type and the site is located on a rare landform.

Representative site for type (a) kanuka shrubland, type (b) sandfield, type (d) *Baumea articulata-Eleocharis sphacelata* reedland, type (e) *Isolepis* sp. sedgeland, type (g) bracken fernland, and type (i) knobby clubrush-*Juncus* sp.-oioi association. Only record of type (g) and (i) in the Ecological District.

The complex of lakes, wetlands and shrubland is an important link in the chain of habitats on the Aupouri Peninsula.

The lake/wetland areas and their biota need continuing monitoring on the effects of apparent hydrological changes.

Approximately 80% of this site is protected by Stewardship Land (340 ha) administered by the Department of Conservation.

HENDERSON BAY RD WETLANDS

Survey no. N03/020
Survey date 14 August 1995
Grid reference N03 173 170, N03 174 167, N03 178 174
Area 10 ha
Altitude 25-40 m asl

Ecological unit

- (a) Open water
- (b) *Eleocharis sphacelata*-raupo reedland in dune hollow
- (c) *Baumea articulata*-*Eleocharis sphacelata*-raupo reedland in dune hollow
- (d) *Eleocharis sphacelata* reedland in dune hollow
- (e) Manuka shrubland on lake margin

Landform/geology

Freshwater wetlands ponded between Pleistocene consolidated parabolic dunes.

Vegetation

This suite of small wetlands is surrounded by pasture.

Site 1

- (a) (N03 178 174) to the north of the road is half open water.
- (b) The remaining area is *Eleocharis sphacelata* and raupo, and is habitat for common waterbirds.

Site 2

- (c) (N03 173 170) at the western end of the road on the north side consists of a *Baumea articulata*-*Eleocharis sphacelata*-raupo wetland with less than 5% open water, type (a). Spotless crane were recorded in 1991.

Site 3

- (N03 173 167) on the south side of the road is about a quarter open water, type (a), possibly intermittently, with kauri stumps visible.
- (d) Two-thirds is dense *Eleocharis sphacelata* with small amounts of *Baumea articulata* and raupo.
- (e) A small area of manuka shrubland to 2m occurs on the margin and *Cassytba*, wattle and *Callistachys lanceolata* are present.

Fauna

Birds: Caspian tern (Category O threatened species), little black shag, and common waterbirds were recorded in 2000 by the OSNZ. NZ dabchick (Category C threatened species) recorded in 2002 (V. Hensley pers. comm.) and spotless crane (Regionally significant species) have been recorded in the past.

Significance

Three small wetlands providing habitat for common waterbirds, two threatened species and a regionally significant species. Representative site for *Baumea articulata*-*Eleocharis sphacelata*-raupo reedland.



Henderson Bay Rd Wetlands N03/020

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

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

LAKE MOREHUREHU & WETLAND

Survey no. N03/021
Survey date 28 August 1995
Grid reference N03 105 288, N03 112 284, N03 114 283
Area 56.6 ha
Altitude 5–20 m asl

Ecological unit

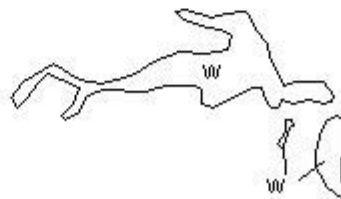
- (a) Open water in dune lake
- (b) *Eleocharis sphacelata* reedland on lake bed
- (c) Manuka shrubland on sand flats



Lake Morehurehu & Wetland N03/021

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

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



Landform/geology

Freshwater wetlands and lakes ponded behind Holocene coastal dunes.

Vegetation

(a) Lake Morehurehu is mostly open water (94%).

(b) A sparse fringe of *Eleocharis sphacelata* occurs. The threatened fern *Todea barbara* is present.

(c) A shrubland margin of abundant manuka occurs with frequent kanuka, emergent *Callistachys lanceolata* and rushes. Kumarahou, toetoe, harakeke, Sydney golden wattle and prickly hakea are occasional.

The southern small lake (N03 114 283) is 60% open water, type (a), with an adjacent wetland of *Eleocharis sphacelata* and rushes and occasional harakeke, type (b).

Significant flora

Todea barbara (Vulnerable).

Fauna

Birds: NI fernbird (Regionally significant species), NZ pipit, grey duck, little shag, black shag. NZ dabchick (Category C threatened species) have been recorded by OSNZ in recent times.

Aquatic fauna: short-finned eel, common bully and inanga.

Significance

A relatively large open-water lake and wetland area provides good habitat for waterbirds and NI fernbird as well as a threatened plant species. A good example of its habitat type. The dune lake, type (a) is a representative example of its type within this District.

WAIRAHI SWAMP & LAKE TAEORE

Survey no.	N03/022
Survey date	28 August 1995
Grid reference	N03 121 270, N03 130 253
Area	127 ha
Altitude	5-10 m asl

Ecological unit

- (a) Raupo reedland in dune hollow
- (b) *Baumea articulata*-manuka swamp association on peat
- (c) Kanuka/manuka shrubland on dunes
- (d) Open water in dune lake

Landform/geology

Freshwater wetland ponded behind Holocene coastal dunes.

Soils

Gley soil (Waipu), organic soil (Ruakaka).

Vegetation

The Wairahi Swamp contains two wetland types:

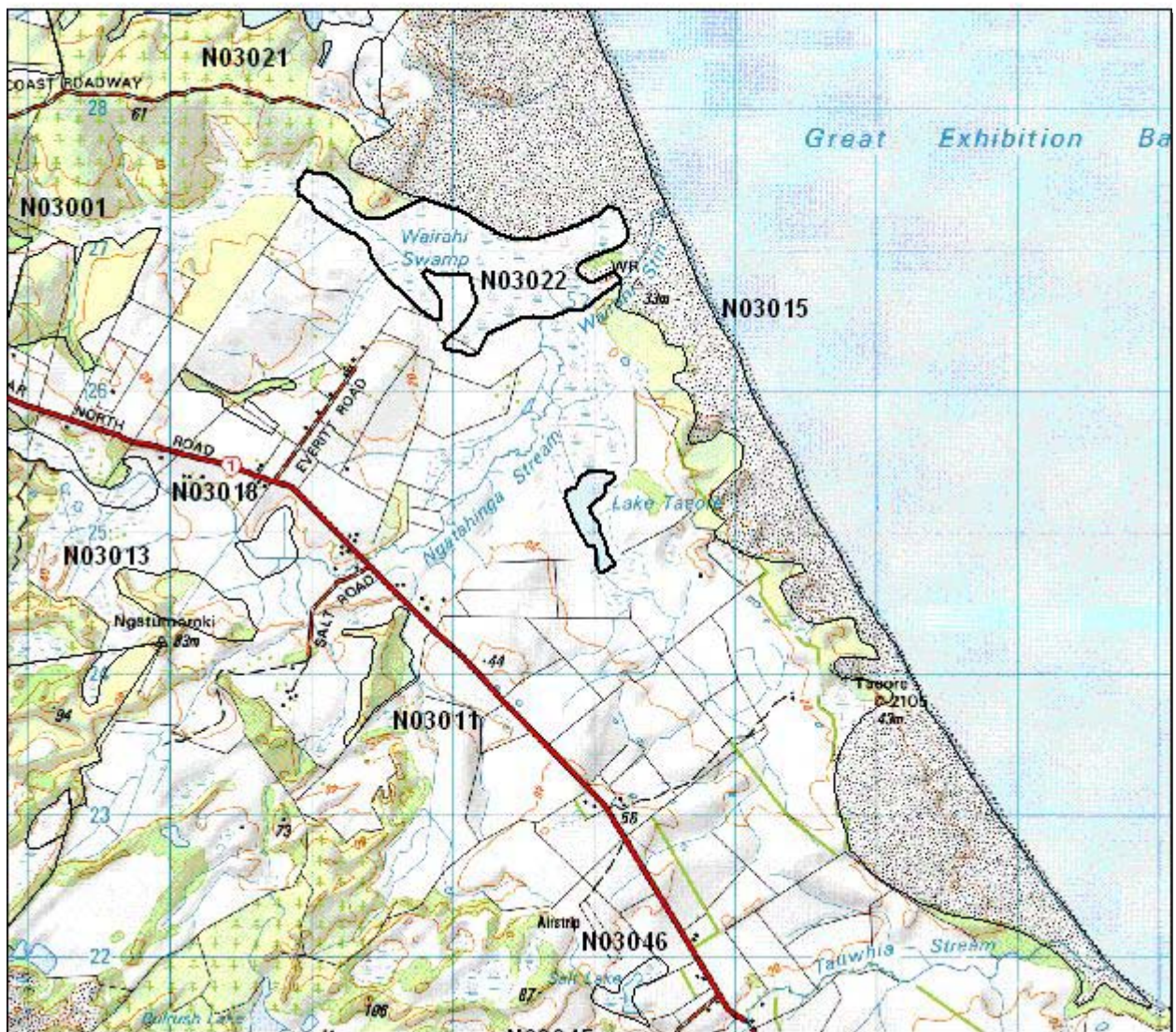
Type (a) raupo dominant with frequent manuka, *Gleichenia* and sedges. The threatened *Thelypteris confluens* is present.

Type (b) *Baumea articulata*-manuka dominance.

(c) Kanuka/manuka shrubland occurs adjacent to the wetland on the northern side. Sydney golden wattle is locally abundant.

(d) Lake Taeore is 10% open water comprising clumps of reeds and raupo swamp. Some manuka shrubland adjoins the site.

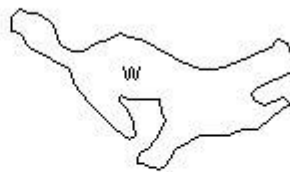
This area appears to be drying out.



Wairahi Swamp & Lake Taeore N03/022

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

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



Significant flora

Thelypteris confluens (Vulnerable).

Fauna

Birds: Past survey (1978): (reported) banded dotterel (Category C threatened species), NZ scaup and (reported) NI fernbird (both Regionally significant)

species), Australasian bittern (Category O threatened species), little shag, NZ scaup, and grey duck.

1991 survey: Caspian tern (Category O threatened species), grey teal (Regionally significant species), NZ shoveler, black shag, breeding black swan, paradise shelduck, Australasian harrier, pied stilt, welcome swallow, spur-winged plover, cattle egret, little egret, and NZ kingfisher.

Lizards: ornate skink (Regionally significant species).

Significance

A large wetland area on the east coast being habitat for a diversity of species including threatened and regionally significant species and a good example of a nationally threatened habitat type.

Representative site for type (a) raupo reedland and type (b) *Baumea articulata*-manuka association with the latter unrecorded elsewhere in the Ecological District.

Lake Taore is a protected Wildlife Management Reserve with approximately 11.4 ha (8.9%) protected within this site. The wider area is very important for several threatened or regionally significant fauna species.

This site also contains soils of national importance:

- (i) lowland organic and gley soils under indigenous vegetation are nationally uncommon.
- (ii) good examples of Waipu and Ruakaka soils are uncommon (most Waipu soils have been developed for dairying).
(Arand et al. 1993).

RARAWA BEACH

Survey no.	N03/023
Survey date	10 August 1995
Grid reference	N03 180 206
Area	59 ha
Altitude	0-20 m asl

Ecological unit

- (a) *Spinifex* grassland on dunes
- (b) Oioi saltmarsh on estuary
- (c) Harakeke-pohuehue association on dunes
- (d) Wattle scrub on dunes

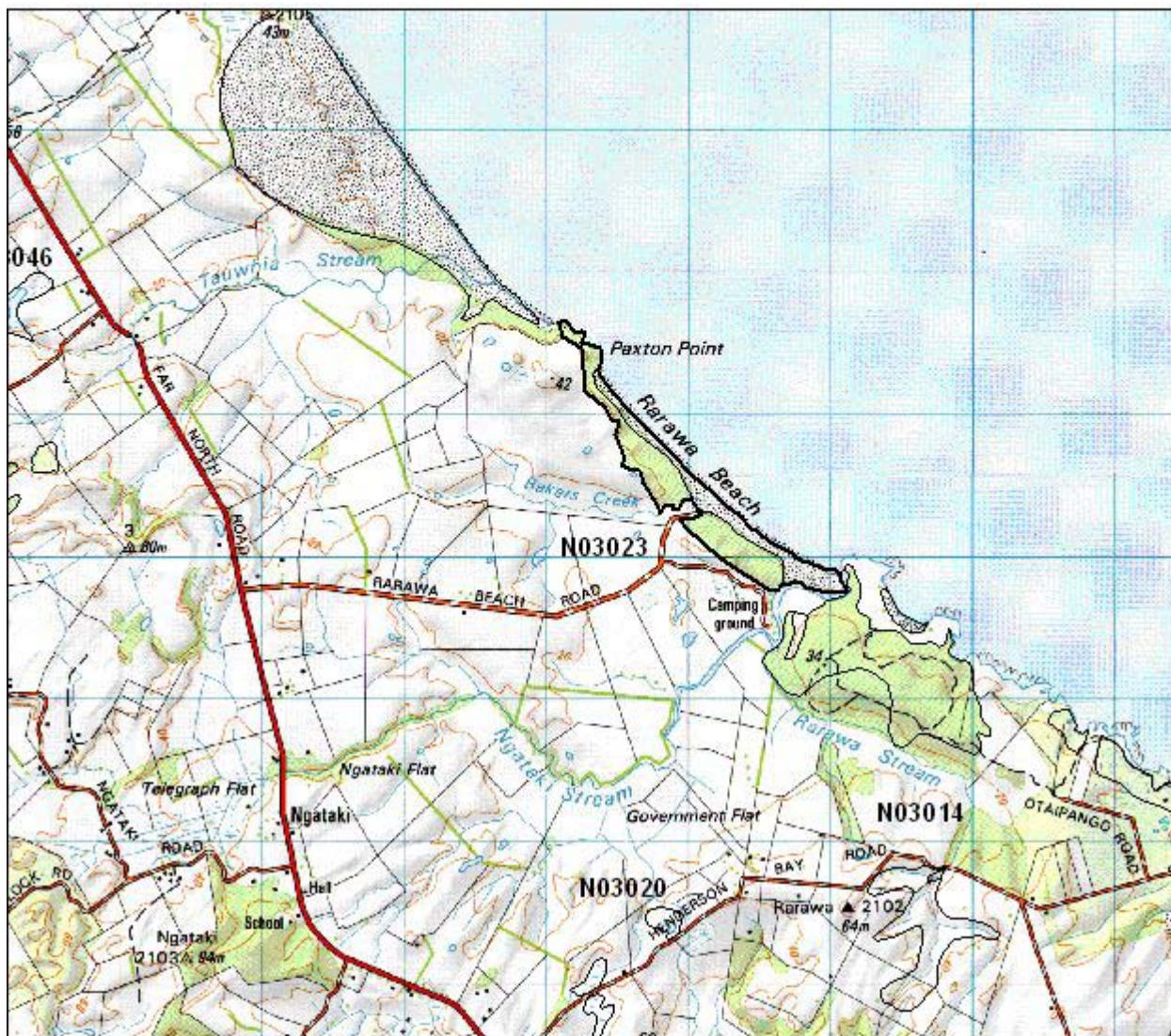
Landform/geology

Beach and Holocene foredune belt backed by Pleistocene leached consolidated sand.

Vegetation

(a) *Spinifex* is abundant on the dunes with frequent pingao, *Coprosma acerosa* and knobby clubrush. Pohutukawa, toetoe, pohuehue, *Pimelea arenaria*, haretail, wild gladiolus, lupin and pampas are also present.

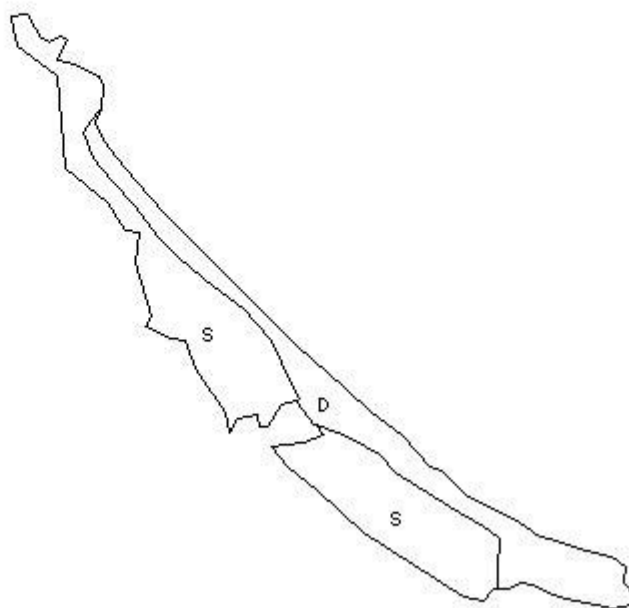
(b) Oioi is common in the tidal reaches of the Ngataki Stream mouth. Saltmarsh ribbonwood occurs frequently. Other species present are mangrove, manuka,



Rarawa Beach N03/023

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

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



kanuka, pohutukawa, glasswort, *Juncus* sp., knobby clubrush, *Callistachys lanceolata*, NZ spinach, taupata, water fern and *Watsonia* sp. Wattle is locally common.

(c) Coastal scrub of harakeke and pohuehue with frequent pohutukawa and toetoe covers the northern point of beach.

(d) The wattle scrub is from 1 to 6 m and contains frequent pohutukawa and occasional harakeke, pohuehue and houpara.

Significant flora

The threatened *Hibiscus diversifolius* (Vulnerable) is recorded from Paxton Point (1984), in a damp seepage below coastal banks. Presence of pingao (Recovering-Conservation Dependent) and *Pimelea arenaria* (Declining) (1998 record).

Fauna

Birds: Northern NZ dotterel (Category B threatened species), variable oystercatcher (Category C threatened species), white-fronted tern (OSNZ year 2000 record) (Category C threatened species), Caspian tern (Category O threatened species).

Significance

An excellent example of dune and tidal stream habitat with a shrubland buffer supporting threatened flora and fauna. A representative site for and the only record of type (c) harakeke-pohuehue association in the Ecological District.

An area of protected stewardship land (approximately 42 ha (71%)) falls within this site, and is administered by the Department of Conservation.

WAGENER'S SWAMPS

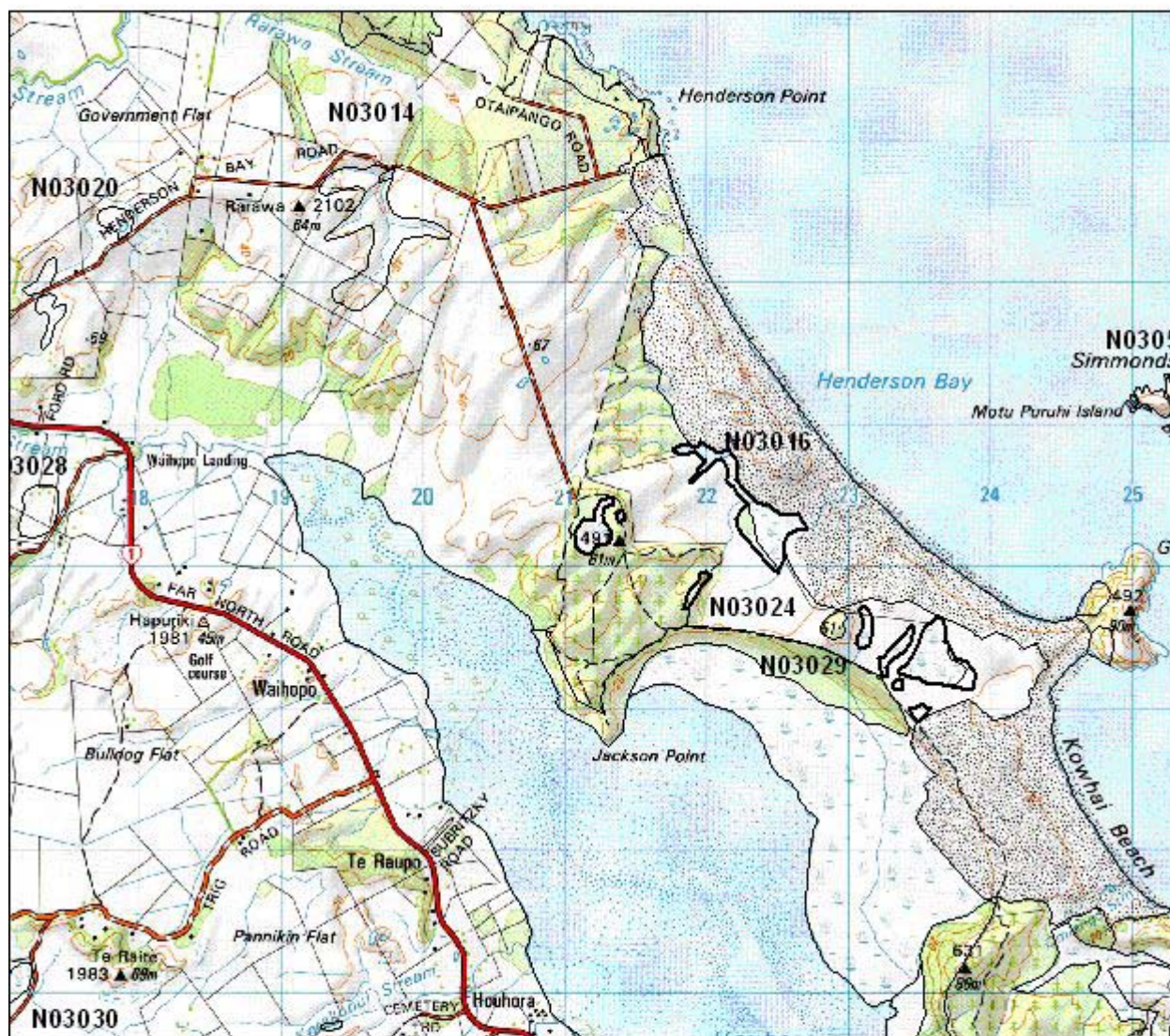
Survey no.	N03/024
Survey date	11 September 1995
Grid reference	N03 213 153, N03 232 146, N03 224 155, N03 234 145, N03 219 148, N03 234 142, N03 228 146, N03 236 144, N03 235 140
Area	45 ha (5 ha shrubland, 40 ha wetland)
Altitude	5-15 m asl

Ecological unit

- (a) Kanuka/manuka-Sydney golden wattle shrubland on swamp margin
- (b) Raupo reedland in dune hollows
- (c) Open water
- (d) *Eleocharis* sp. reedland in dune hollows
- (e) Manuka-*Eleocharis sphacelata* swamp association in dune hollows

Landform/geology

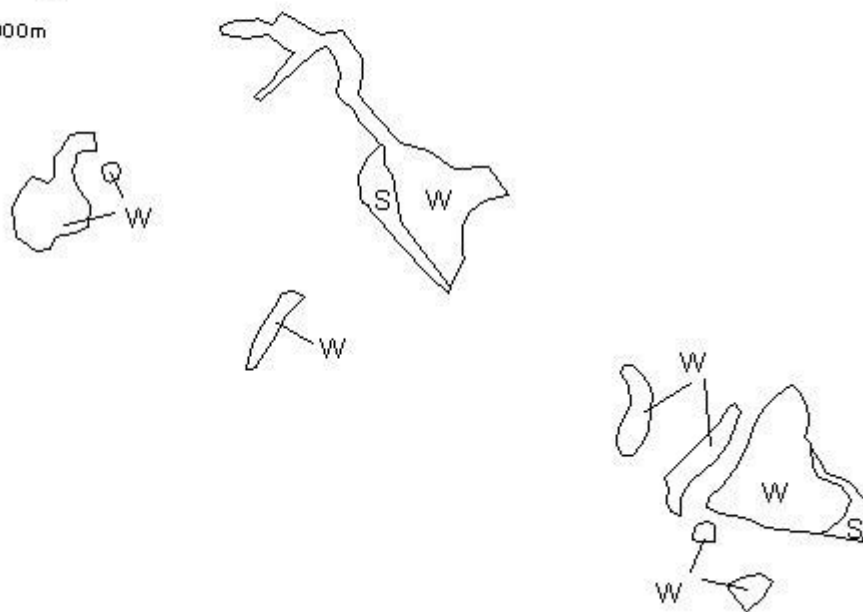
Freshwater wetlands on leached Pleistocene consolidated sand and ponded behind Holocene coastal dunes.



Wagener's Swamps N03/024

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

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



Vegetation

A series of mostly small wetlands. Some have a narrow fringe of kanuka/manuka and Sydney golden wattle, type (a), others have pines or pasture to the margins.

The wetlands are either:

Type (b) raupo dominant. Open water, type (c) comprises approximately 10%, which may be intermittently present.

Type (d), *Eleocharis* sp. dominant. Type (e), manuka may be abundant in association with *Eleocharis sphacelata*, raupo and other sedges may be present.

Fauna

Birds: Australasian bittern (Category O threatened species), NZ dabchick (Category C threatened species), little shag and other common waterbirds recorded by OSNZ in recent surveys.

Aquatic fauna: 1999 survey of black mudfish (Category C threatened species), banded kokopu (Category C threatened species), and short-finned eel.

Significance

A suite of wetlands with threatened species present. A representative site for type (e) manuka-*Eleocharis sphacelata* swamp association.

LAKE WAIHOPO & SHRUBLANDS

Survey no.	N03/025
Survey date	10 August 1995
Grid reference	N03 149 162, N03 156 160, N03 145 150
Area	101 ha (73 ha shrubland, 28 ha wetland)
Altitude	20-40 m asl

Ecological unit

- (a) Open water in dune lake
- (b) *Eleocharis sphacelata* reedland on lake bed
- (c) Kanuka shrubland on dunes
- (d) *Baumea articulata* reedland on swampy sand flats

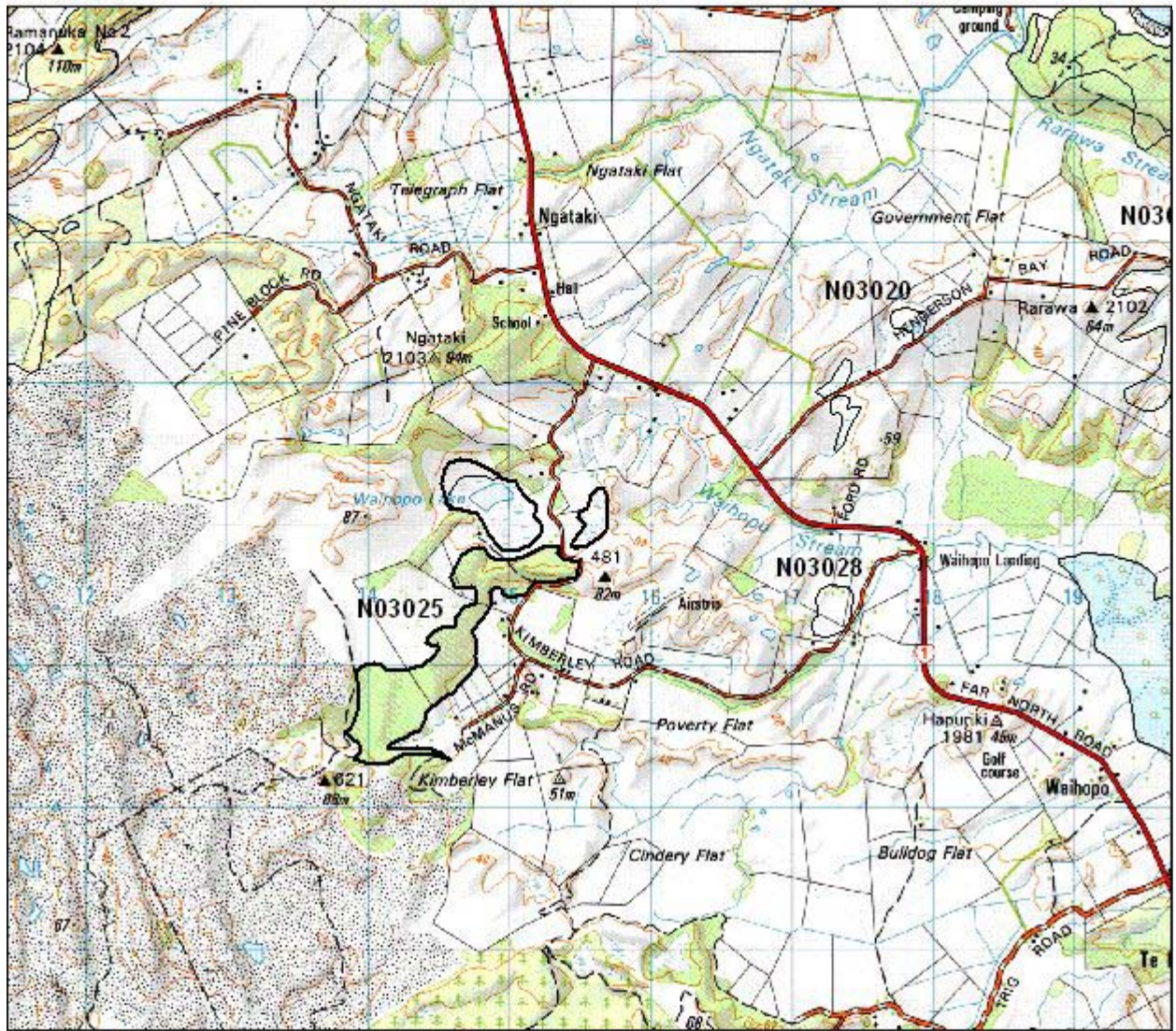
Landform/geology

Late Pleistocene unconsolidated parabolic dunes with swampy interdune flats.

Vegetation

- (a) Half of the lake is open water.
- (b) The remainder is *Eleocharis sphacelata* dominant with frequent *Baumea articulata* and raupo.
- (c) There is a small area of kanuka shrubland nearby.
- (d) Across the road the Landcorp swamp is mostly *Baumea articulata*, with frequent raupo and low manuka. A small amount of open water is seasonally present. Stock graze to the margins.

Type (c) occurs to the south, where Sydney golden wattle is common or frequent. Gorse is locally frequent. Black wattle and pohutukawa are also present.



Lake Waihopo & Shrublands N03/025

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

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



Significant flora

Utricularia protrusa and *Thelypteris confluens* (Vulnerable).

Fauna

Birds: spotless crane (Regionally significant species), grey duck, NZ dabchick (Category C threatened species), chestnut-breasted shelduck, NZ shoveler, black shag, pied shag, little shag and other common waterbirds were recorded by the OSNZ in early 2000 (Snell 2000).

Aquatic fauna: black mudfish (Category C threatened species).

Significance

Central shrubland and wetland area providing a linkage between the various habitats which stretch along Aupouri Peninsula.

Important habitat for the threatened NZ dabchick, the regionally significant spotless crane and other waterbirds. Presence of two threatened plants.

The threatened black mudfish were recorded from Lake Waihopo in 1998.

Representative site for type (b) *Eleocharis sphacelata* reedland and type (d) *Baumea articulata* reedland.

LAKE WAHAKARI

Survey no.	N03/026
Survey date	15 August 1995
Grid reference	N03 040 277
Area	239 ha (77 ha shrubland, 162 ha wetland)
Altitude	45-60 m asl

Ecological unit

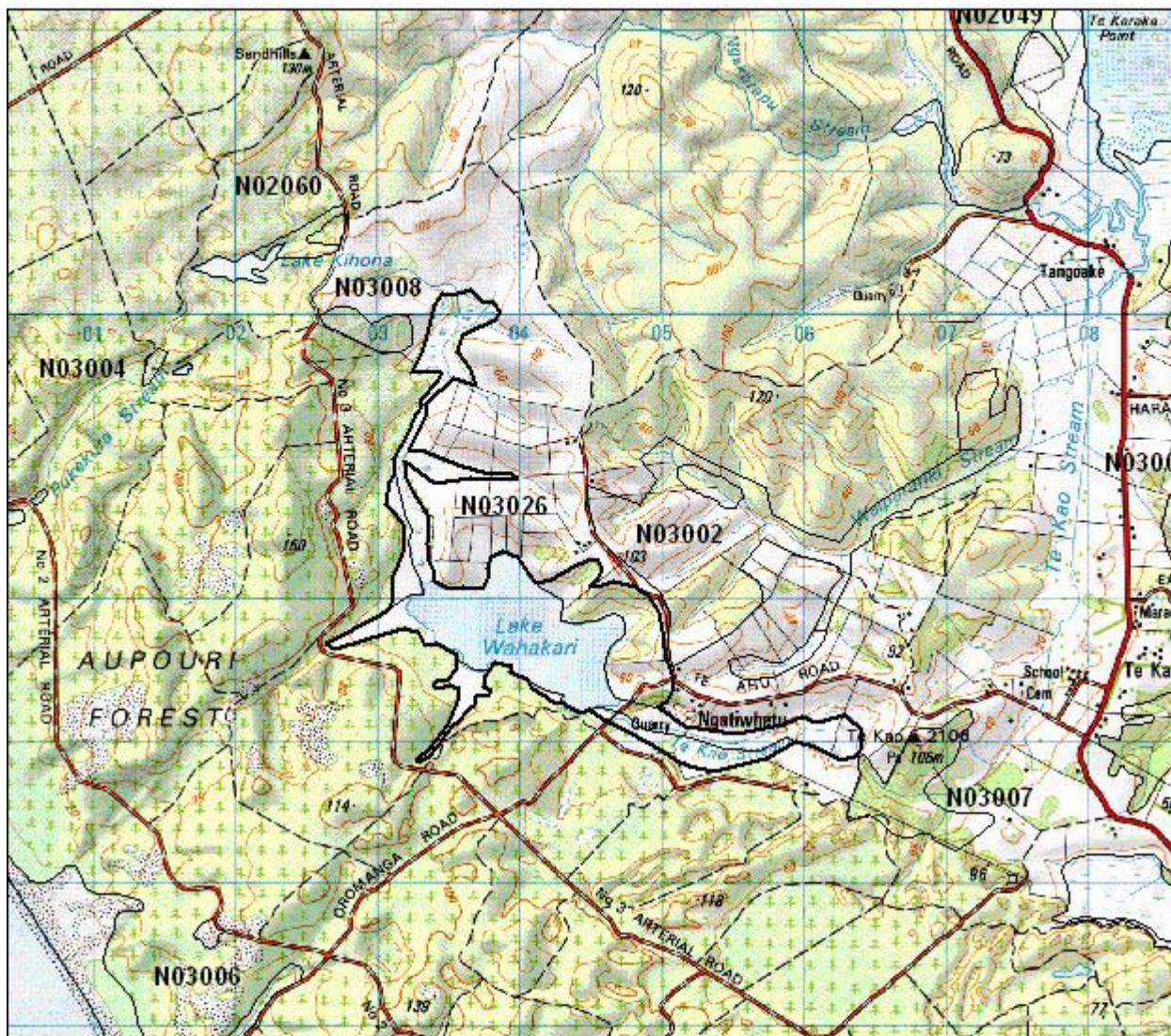
- (a) Open water in dune lake
- (b) Raupo-*Eleocharis sphacelata* reedland in valley
- (c) *Gleichenia dicarpa*-manuka swamp association in bog
- (d) Raupo reedland in bog
- (e) Kanuka shrubland on hillslope

Landform/geology

Catchment with lake and freshwater wetlands ponded between hill country of deeply weathered Tangihua Complex rocks on the true left, and Pleistocene parabolic dunefields on the true right.

Vegetation

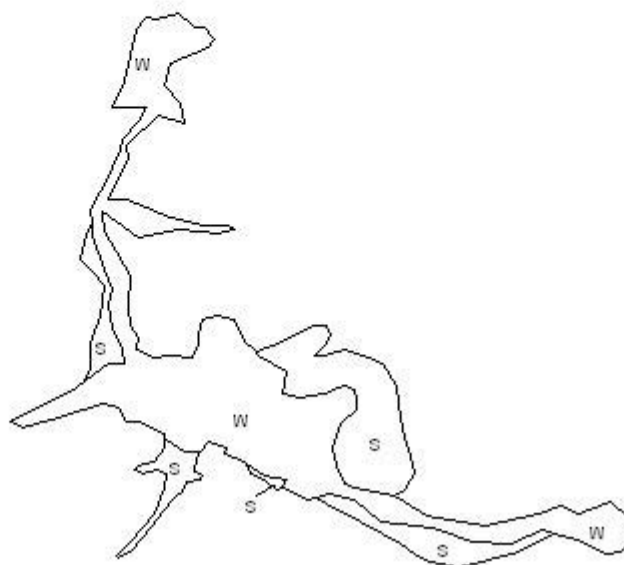
- (a) A large lake with a discontinuous fringe of type (b), raupo and *Eleocharis sphacelata*, and wetlands at each end.
- (c) At the western end is a *Gleichenia dicarpa*-manuka bog.
- (d) At the eastern end a raupo swamp with occasional harakeke, manuka and other sedges which is broken up into arms within pasture.
- (e) On the eastern side kanuka shrubland from 1 to 4 m occurs, with frequent manuka. Ti kouka, harakeke, hangehange, kumarahou, gorse and prickly hakea are also present.



Lake Wahakari N03/026

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

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



Significant flora

Utricularia protrusa (Vulnerable), *Isolepis fluitans* (Declining), 1999 record of *Pomaderris polifolia* (Vulnerable).

Fauna

Birds: NZ scaup, spotless crane and NI fernbird (all Regionally significant species), NZ pipit, black shag, pied shag, grey duck.

Aquatic fauna: long-finned and short-finned eel, common smelt, common bully, red-finned bully, and inanga. Mosquito fish have also been recorded.

Lizards: 1980 record of Pacific gecko.

Significance

An excellent example of a large freshwater lake system supporting threatened and regionally significant species and potential habitat for the threatened NZ dabchick.

Representative site for type (a) open water, type (c) *Gleichenia dicarpa*-manuka swamp association, type (d) raupo reedland and type (e) kanuka shrubland. Type (c) is solely recorded from this site in the Ecological District.

PURIRI-KARAKA REMNANT

Survey no.	N03/027
Survey date	15 August 1995
Grid reference	N03 053 234
Area	1.2 ha
Altitude	50-60 m asl

Ecological unit

Puriri-karaka forest on dunes

Landform/geology

Late Pleistocene unconsolidated parabolic dunes.

Vegetation

An outlier of the Te Arai area consisting of coastal broadleaf forest dominated by puriri with karaka sub-dominant. Kanuka is less common while houpara, kawakawa, wharangi, pohutukawa, native broom and ngaio occur occasionally.

Significant flora

Of botanical interest is the presence of *Myrsine* aff. *divaricata* previously thought to be endemic to the Poor Knights (P.J. de Lange pers. comm. 1999).

Fauna

Birds: Common bush birds. Other fauna not surveyed.

Significance

A very small but unique vegetation/geomorphological combination for the Aupouri Ecological Region. It is the last remaining habitat of its type in the Ecological Region. A representative site for puriri-karaka forest which is not recorded elsewhere in the District and is the only example of its type on dunes in Northland (P. Anderson, L.J. Forester pers. comm. 2000).



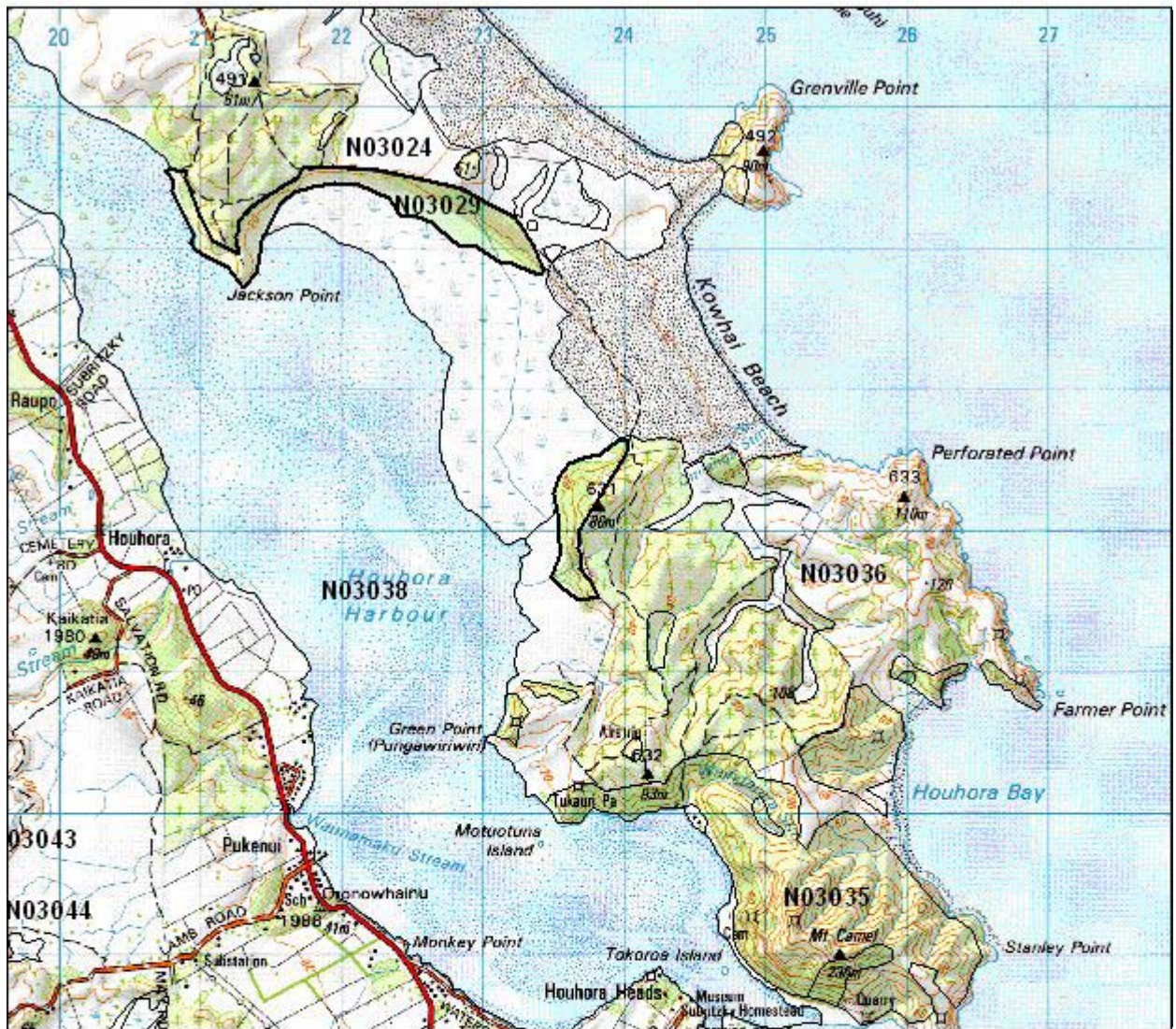
Puriri - Karaka Remnant N03/027

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

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

JACKSON POINT SHRUBLAND

Survey no.	N03/029
Survey date	9 August 1995
Grid reference	N03 221 145, N03 236 123
Area	89 ha
Altitude	0-25 m asl



Jackson Point Shrubland N03/029

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

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



Ecological unit

- (a) Wattle-kanuka/manuka shrubland on coastal hillslope
- (b) Manuka shrubland on coastal hillslope
- (c) Wattle shrubland on coastal hillslope

Landform/geology

Coastal hillsides and cliffs of Pleistocene leached consolidated sand with underlying Houhora Complex greywacke outcropping in cliffs and shore platform at Jackson Point.

Vegetation

(a) Wattle and kanuka/manuka to 3 m occurs in both the northern and southern area and constitutes the main vegetation type. *Cassya*, pohutukawa and ti kouka are present.

(b) Less than 5% of the area is manuka to 2 m.

(c) An area about twice this size is wattle dominant with frequent kanuka/manuka and pohutukawa.

Fauna

Birds: Common bush birds. Other fauna not surveyed.

Significance

A shrubland area buffering an estuarine marsh on Houhora Harbour.

TE RAITE WETLAND

Survey no.	N03/030
Survey date	10 August 1995
Grid reference	N03 170 119
Area	9.9 ha
Altitude	25-35 m asl

Ecological unit

(a) *Eleocharis sphacelata*-raupo reedland in dune hollow

(b) Open water

Landform/geology

Freshwater wetland ponded by Pleistocene consolidated parabolic dunes.

Vegetation

(a) *Eleocharis sphacelata* is dominant and raupo common. Mamaku, kanuka, *Cassya*, harakeke, *Azolla* and other sedges are also present.

(b) About 5% of the area is open water. Wattle and pines grow to the margins.

Fauna

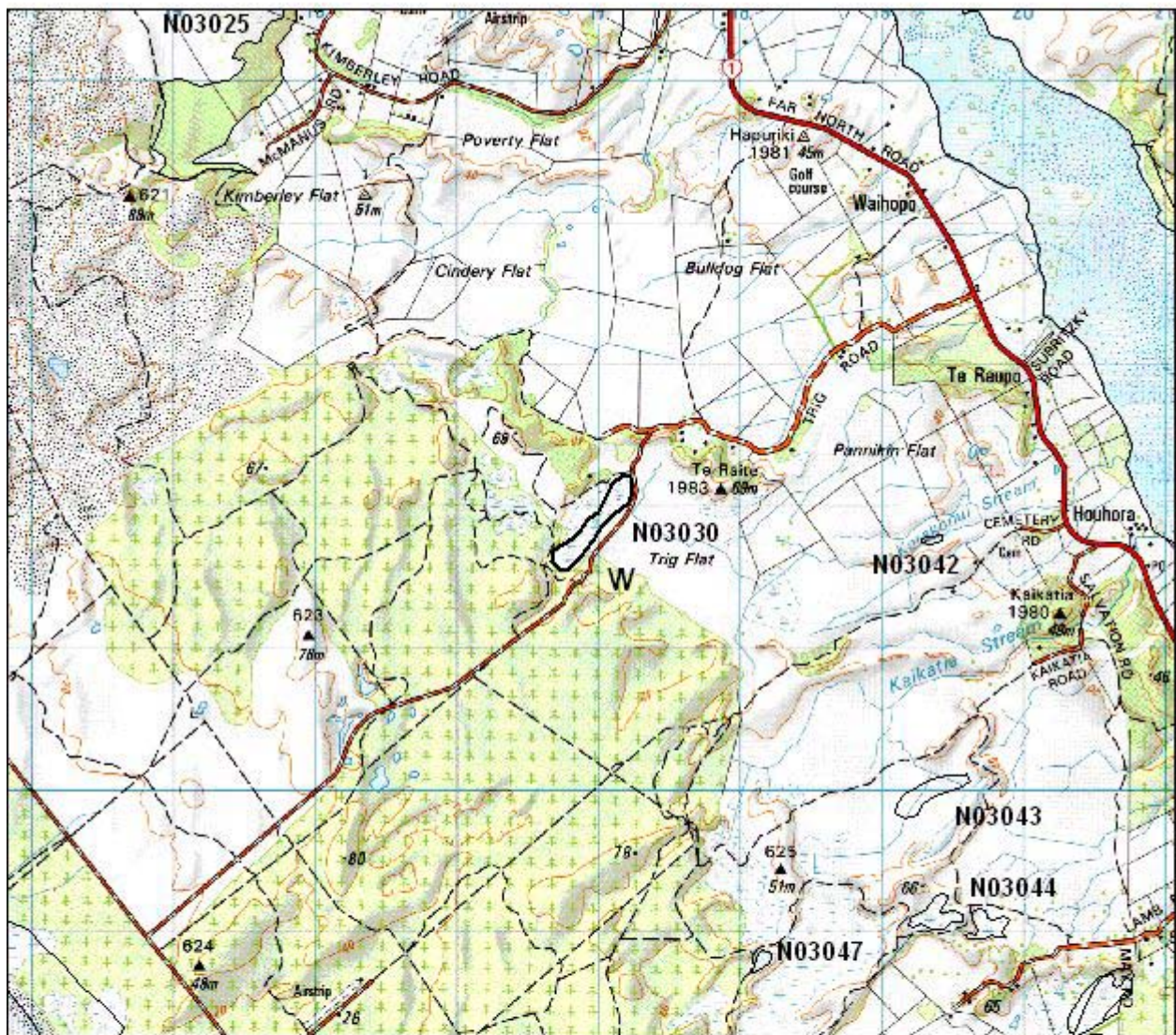
NZ dabchick (Category C threatened species), spotless crane (Regionally significant species), and common waterbirds (OSNZ 2000 survey).

Significance

A wetland of reasonable size which is a nationally under-represented habitat type.

Habitat for threatened and regionally significant species.

A representative site for type (a) *Eleocharis sphacelata*-raupo reedland.



Te Raitu Wetland N03/030

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

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

KAIMAUMAU-MOTUTANGI WETLANDS

Survey no.	N03/031
Survey date	9 August 1995
Grid reference	Midpoint of site is N03 300 000. The whole site is represented on N03, N04, O03 and O04
Area	4,075 ha (2,205 ha shrubland, 1,870 ha wetland)
Altitude	1-20 m asl

Ecological unit

- (a) Kanuka/manuka shrubland on raised sand ridges
- (b) Manuka shrubland on raised sand ridges and flats
- (c) Manuka shrubland on low peaty depressions and flats
- (d) Manuka-*Schoenus brevifolius* association on damp peaty flats
- (e) *Gleichenia dicarpa*-*Schoenus brevifolius* association on peaty sand flats
- (f) Black wattle-Sydney golden wattle association on dry sand ridges and flats
- (g) *Baumea* spp.-manuka association in peat bog
- (h) Harakeke-raupo reedland in swamp
- (i) *Baumea teretifolia*-*Gleichenia dicarpa* association in peat bog

Landform/geology

Holocene coastal foredune belt backed by Pleistocene consolidated foredunes and overlying swamp deposits.

Vegetation

A large, highly acid infertile bog ecosystem with more fertile areas near in-flowing streams and farmland edges.

(a) Kanuka/manuka dominate the canopy in dense thickets together with prickly hakea, Sydney golden wattle and the twining *Cassytha*. The understorey generally consists of bracken, mingimingi, *Coprosma rhamnoides*, hangehange, mamaku, *Lepidosperma laterale*, turutu and some terrestrial ferns, gorse and hakea.

Type (b) is either

(i) lower shrubland (1–2.5 m) consisting of dense thickets of manuka, and to a lesser extent kanuka, interspersed with *Baumea*, mingimingi, bracken, *Schoenus tendo*, hakea and *Gleichenia* sp. and scattered ground orchids, especially *Thelymitra* species, or

(ii) taller unburnt vegetation above the north western corner of Lake Waikaramu, comprising pure manuka to 5 m with *Schoenus tendo* and occasional *Coprosma areolata* and harakeke in the understorey. Near the lake edge, wire rush is common and the threatened duck-billed orchid *Cryptostylus subulata* is found in wet, disturbed ground.

(c) Manuka dominated gumland occurs in depressions between sand ridges to the north-west between Norton and Lake Roads. It is associated with kumarahou, hakea, *Dracophyllum lessonianum*, *Morelotia affinis*, *Lycopodium deuterodensum*, comb fern and *Schoenus brevifolius* in hollows.

In depressions old burnt manuka stands are regenerating in type (d) manuka and *Schoenus brevifolius*. Other species present include prickly hakea, turutu, mingimingi, kumarahou and bracken, with occasional wattle.

In the former “orchid block”, the vegetation is more open, with manuka and sedges and bare, open areas, now surrounded by dense wattle.

A dense stand of damp sedgeland type (e) *Gleichenia dicarpa* with *Schoenus brevifolius* occurs near the road junction at the north-western corner of Lake Waikaramu and in peaty depressions amongst type (d).

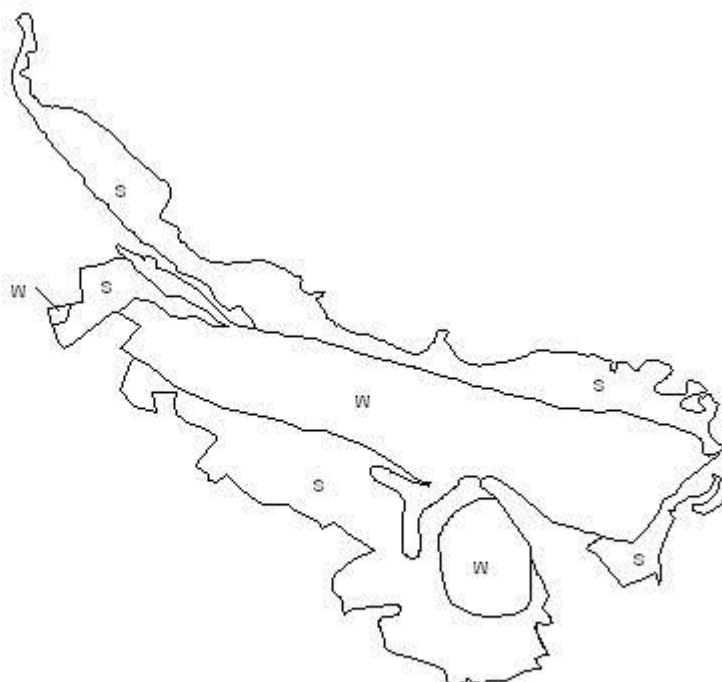
Exotic vegetation, type (f), is conspicuous on the periphery of the site, especially in drier areas in the south-west sector and around Lake Waikaramu, where previous disturbance including repeated burning, has occurred, and



Kaimaumau - Motutangi Wetlands N03/031

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

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



wattles, both black wattle and Sydney golden wattle, have displaced indigenous vegetation. Other fire-resistant species predominant are prickly hakea, downy hakea, and to a lesser extent, *Callistachys lanceolata*.

In some areas, Sydney golden wattle is abundant, sometimes forming a monoculture. A scattered understorey may be present comprising spindly manuka, bracken, hangehange, mingimingi, *Baumea juncea*, *Schoenus tendo*, and *Lepidosperma laterale*. Prickly moses, gorse and pampas may be present.

About 5% of the area consists of gorse and adventive broom.

Pine, gum and macrocarpa are locally frequent in drier parts of the wetland.

Acid peat bog type (g) is mainly at the eastern end of the Motutangi Block. Clumps of manuka are emergent over *Baumea* sedges, *B. rubiginosa* with *B. arthropphylla* and/or *B. teretifolia*, sometimes in dense swards, *Gleichenia* sp., *Schoenus brevifolius*, *Pimelea* sp., wire rush, bracken, sundew and orchids, with *Eleocharis sphacelata* occurring in the wettest holes and *Cryptostylis subulata* may also be present.

(h) Harakeke and raupo are dominant, and generally confined to the western end of Motutangi. Other species frequently occurring are *Baumea* sp. and *Schoenus* sp. sedges in dense swards, manuka, *Coprosma tenuicaulis*, kiokio, wire rush, *Carex virgata* and swamp millet with threatened ferns *Thelypteris confluens* and *Cyclosorus interruptus*.

In type (i), *Baumea teretifolia* and *Gleichenia dicarpa* thrive on the sides and bottoms of gumholes. Sundews and the combfern *Schizaea fistulosa* are also present, with *Sphagnum* in the hole bottoms.

Significant flora

The outstanding natural values of this site include a large number of threatened species including:

Endangered

Phylloglossum drummondii (1998 record).

Vulnerable

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

Declining

Cyclosorus interruptus, *Myriophyllum robustum* and *Pterostylis tasmanica*.

Taxonomically Indeterminate-Critically Endangered

Calochilus aff. *herbaceus*.

Naturally Uncommon-Sparse

Korthalsella salicornioides and *Thelymitra sansscilia*.

Naturally Uncommon-Range Restricted

Thelymitra malvina and *Cryptostylis subulata*.

Taxonomically Indeterminate-Insufficiently Known

Spiranthes aff. *novae-zelandiae*.

Regionally significant species

Utricularia delicatula (largest NZ population) (Clunie & Ogle 1983), wire rush and *Corybas rotundifolius*.

1897 record of *Atriplex hollowayi* by Carse by the Rangaunu Harbour and anecdotal records in the 1970s on East Beach (V. Hensley pers. comm.).

Fauna

Birds: Over 40 species of birds have been recorded including northern NZ dotterel (Category B threatened species). Category C threatened species include banded dotterel, white-fronted tern, and variable oystercatcher. Category O threatened species include Caspian tern, and Australasian bittern. Other bird species include three regionally significant species, NI fernbird, banded rail and spotless crane. Also present is the SI pied oystercatcher.

Aquatic fauna: black mudfish (Category C threatened species), banded kokopu (Category C threatened species), giant bully (Regionally significant species), red-finned bully, common bully, inanga, short-finned eel and freshwater shrimp.

Lizards: Northland green gecko (Regionally significant species), copper skink.

Significance

A large wetland complex system which has an unbroken zonation of wetland sequences from seawater to freshwater and contains diverse habitats including sandy beach (see East Beach N03/040), small dunes, estuarine peat bogs, semi-fertile swamps and stabilised dunes with native shrublands. Old kauri logs remain in some areas. Peat bogs and semi-mineralised wetlands are a much depleted vegetation type. Diversity of flora and fauna species including many threatened species and regionally significant species. The Kaimaumu-Motutangi Wetlands provide very important habitat for NI fernbird, Australasian bittern and other birds because of the large area and quality of habitat.

A representative site for seven vegetation types: kanuka/manuka shrubland, manuka shrubland, manuka-*Schoenus brevifolius* association, *Gleichenia dicarpa*-*Schoenus brevifolius* association, *Baumea* spp.-manuka association, harakeke-raupo reedland, and *Baumea teretifolia*-*Gleichenia dicarpa* association, with the last-named unrecorded elsewhere in the Ecological District.

This area is contiguous with Houhora Harbour, East Beach and Rangaunu Harbour-Lake Ohia, and along with the three northern harbours of Rangaunu, Houhora and Parengarenga is being investigated for RAMSAR status as a wetland of international significance. More than 100 ha has been cleared since 1995.

Department of Conservation administered land protects a total of 2,825.6 ha (69.3%) which includes 1,889 ha of Stewardship Land, 929.3 ha of Scientific Reserve, and 7.3 ha of Marginal Strip.

References: Anderson (1988); Anderson et al. (1992); Clunie (1988); Hicks et al. (2001).

HUKATERE LOOKOUT

Survey no.	N03/032
Survey date	15 August 1995
Grid reference	N03 188 017, N03 183 013, N03 188 013, N03 195 005, N04 195 995
Area	207 ha
Altitude	5-53 m asl

Ecological unit

- (a) Manuka shrubland on dunes
- (b) Kikuyu-sedge coastal association on dunes
- (c) Oioi rushland in dune hollows
- (d) Harakeke-manuka association on dunes
- (e) Pohutukawa forest on dunes

Landform/geology

Holocene coastal dunes overlying eroded Pleistocene consolidated parabolic dunes.

Vegetation

Type (a) occurs on Hukatere Hill with scattered harakeke, and karo and houpara on the sheltered side. A band of manuka links the hill to the pine forest and continues north along the boundary of the pines.

(b) Occurs on the lower slopes of Hukatere Hill with scattered patches of knobby clubrush, mingmingi, bracken and harakeke with occasional toetoe, pampas and isolated pohutukawa.

Kikuyu is dominant in large patches, especially near the road and track behind the foredune, and along the pine forest margin in the southern block. Pohuehue and knobby clubrush are locally common, with *Spinifex*, *Coprosma acerosa*, shore bindweed, toetoe and pampas scattered. Tauhinu occurs rarely. Patches of the exotic iceplant *Carpobrotus edulis* dominate areas of several square metres, especially near the road and tracks. Lupin also occurs in scattered patches and fleabane and dandelion are also scattered. Buffalo grass is locally common.

Some hummocks are covered in oioi and toetoe.

(c) Occurs in dune hollows over an extensive area, particularly to the south of the block. Clumps of harakeke are frequent and toetoe occasional.

(d) Harakeke with manuka to 2 m grades out of type (c) and is most extensive in the southern sector. Toetoe and pampas are occasional.

Type (e) occurs on two sites towards the rear of the block, south of Hukatere Rd, where pohutukawa form small, dense stands on the top of dunes.

Fauna

Not surveyed.

Significance

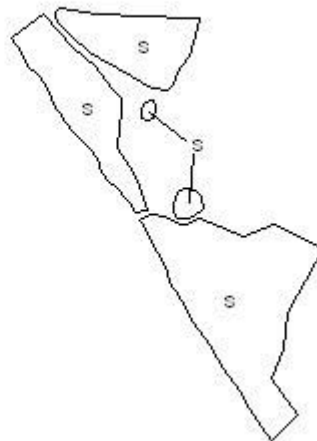
A large area of regenerating coastal shrubland on the west coast being representative of a habitat type much reduced from its former extent. Representative site for type (a) manuka shrubland, type (c) oioi rushland, type (d) harakeke-manuka association, and type (e) pohutukawa forest.



Hukatere Lookout N03/032

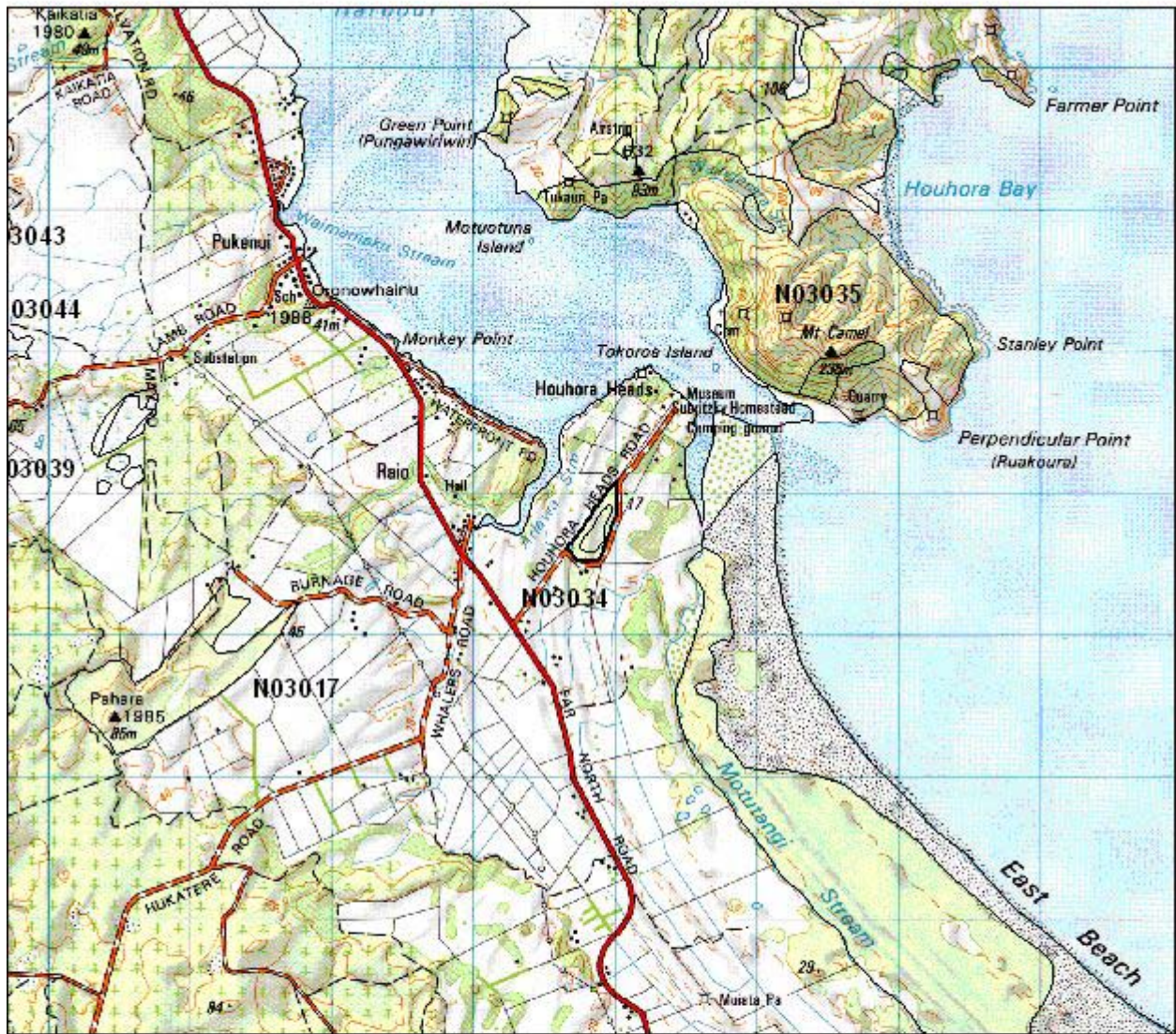
Each grid is 1000 m x 1000 m
and = 100 ha.

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



HOUHORA HEADS RD WETLAND

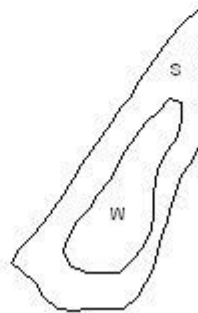
Survey no.	N03/034
Survey date	9 August 1995
Grid reference	N03 239 078
Area	9 ha (6 ha shrubland, 3 ha wetland)
Altitude	5-15 m asl



Houhora Heads Rd Wetland N03/034

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

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



Ecological unit

- (a) Manuka-Cassitha shrubland in dune hollow
- (b) Wattle-kanuka shrubland in dune hollow

Landform/geology

Freshwater wetland ponded on belt of last interglacial consolidated foredunes.

Vegetation

(a) Three quarters of the area is manuka between 1 m and 2 m, commonly covered with *Cassutha*. Isolated raupo is present indicating the area is intermittently wet. Other species occurring are kumarahou, bracken, mingimingi, *Schoenus brevifolius* and *Lepidosperma laterale*.

(b) There is a fringe of wattle and kanuka with frequent prickly hakea and occasional *Cassutha* and pampas.

Fauna

Not surveyed.

Significance

A reasonable sized wetland with limited modification and a shrubland buffer. A representative site for type (a) manuka-*Cassutha* shrubland.

MT CAMEL

Survey no.	N03/035
Survey date	9 August 1995
Grid reference	N03 268 109, N03 262 108, N03 256 105, N03 256 090, N03 235 108, N03 232 107
Area	291 ha (11 ha forest, 278 ha shrubland, 2 ha wetland)
Altitude	0-236 m asl

Ecological unit

(a) Kanuka/manuka shrubland on rolling and steep coastal hillslope

(b) Pohutukawa-kanuka-puriri broadleaf forest on coastal hillslope

(c) *Astelia* sp.-kanuka association on rock

(d) Manuka swamp shrubland in gully

Landform/geology

Promontory of deeply weathered Houhora Complex volcanics and greywacke rock units.

Vegetation

Predominantly shrubland vegetation including numerous remnants with a small area of broadleaf coastal forest.

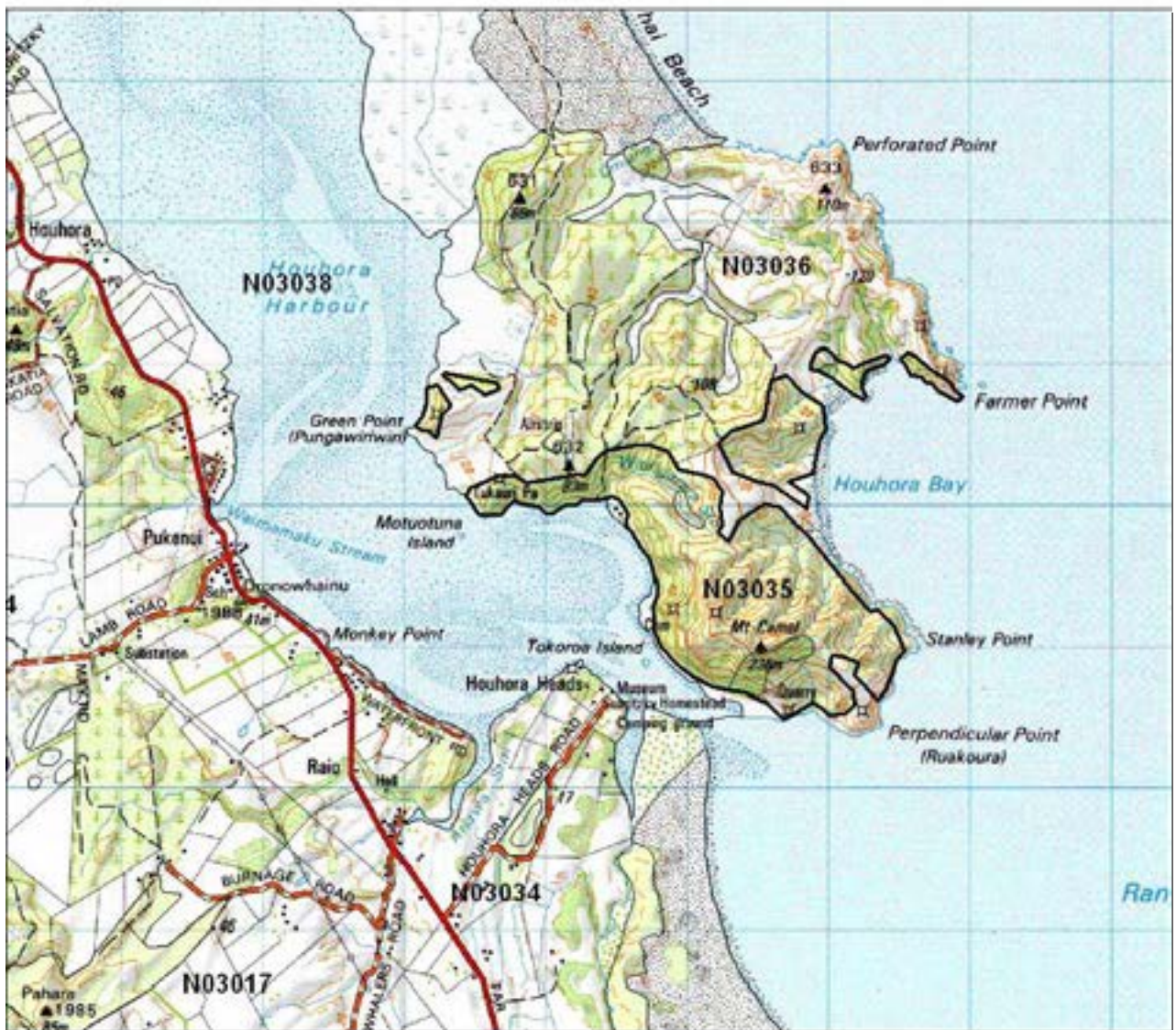
Mt Camel is heavily modified with stock having access to most areas (R. Cawte pers. comm.).

(a) Most of the area is kanuka/manuka dominant, of varying height, with locally frequent pohutukawa. Ti kouka, puriri, kohekohe, harakeke, pampas, prickly hakea, brush wattle, mamaku, manuka, pine and *Cassutha* are also present.

(b) About 10% of the area contains abundant pohutukawa with puriri and kanuka commonly occurring and frequent kohekohe and taraire in gullies.

(c) A small area of bare rock contains frequent *Astelia* sp. and kanuka.

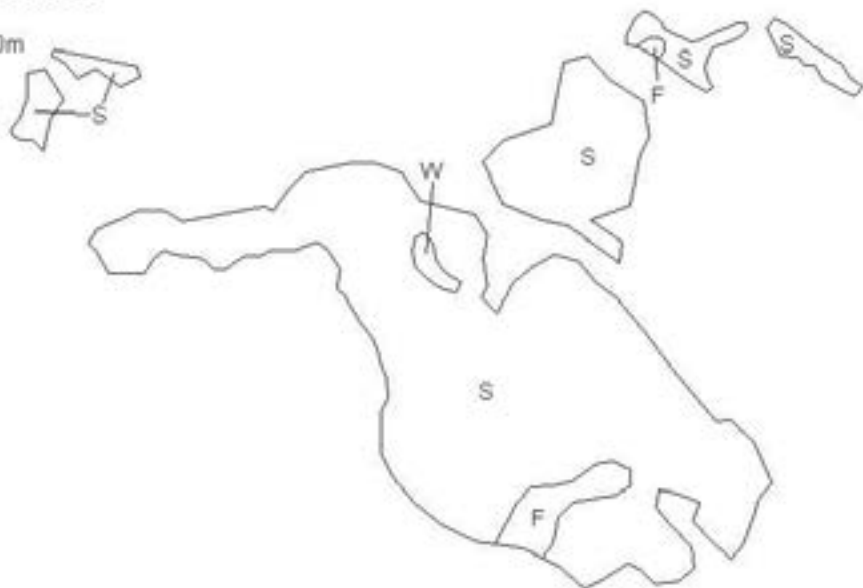
(d) A small gully wetland contains frequent raupo with occasional ti kouka and mamaku.



Mt Camel N03/035

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

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



Significant flora

Senecio scaberulus (Vulnerable) and *Fuchsia procumbens* (Naturally Uncommon-Sparse) were collected near Perpendicular Point in 1992. 1992 record of *Utricularia protrusa* (Vulnerable) at Mt Camel swamp.

Ophioglossum petiolatum (Vulnerable) is present as is *Tbelymitra* "rough leaf" AK 229531 (Regionally significant species). *Euphorbia glauca* (Declining) was recorded from here by Chinnock in 1971 and there is a 1965 record of *Colensoa physaloides* (Declining).

On the southern coast of Mt Camel, *Hebe speciosa* (AK 107327) (Endangered) was collected in 1915.

Fauna

Birds: Common bush birds and a potential stepping stone for cuckoo species, kukupa and other birds.

Snails: *Allodiscus* sp. "Houhora" (Nationally Endangered), *Climocella reinga* (Range Restricted). Northland-Auckland endemic snails, *Paracharopa delicatula*, and *Phrixgnathus* sp. aff. *P murdochi*.

Aquatic fauna: 1999 records of banded kokopu (Category C threatened species), giant bully (Regionally significant species), long-finned eel, red-finned bully, and inanga.

Lizards: 1971 record of Northland green gecko (Regionally significant species), 1972 record of ornate skink (Regionally significant species), shore skink and common gecko.

Significance

Remnants of coastal forest to the east of the entrance to Houhora Harbour with a regenerating buffer, with several species which are threatened, endemic or of restricted distribution.

A stepping stone for migrating/dispersing forest birds.

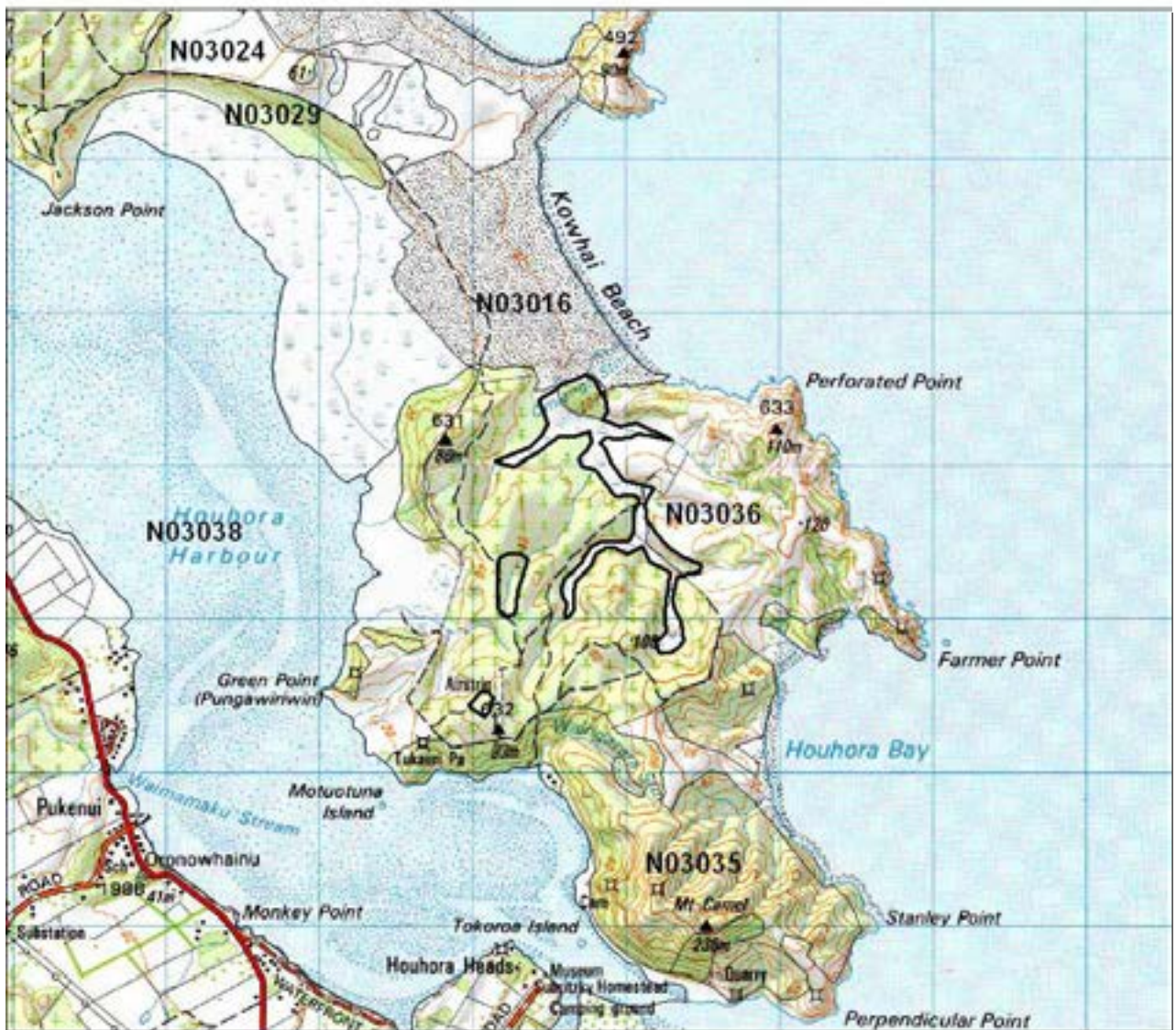
Representative site for kanuka/manuka shrubland and representative site and only record in the Ecological District for *Astelia* sp.-kanuka association and pohutukawa-kanuka-puriri forest.

KOWHAI SWAMPS

Survey no.	N03/036
Survey date	11 September 1995
Grid reference	N03 250 118, N03 243 113, N03 241 104
Area	48 ha (9 ha shrubland, 39 ha wetland)
Altitude	15-40 m asl

Ecological unit

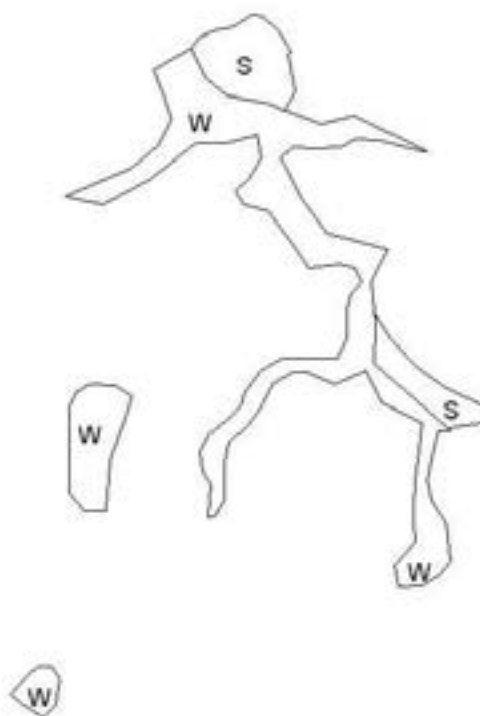
- (a) Raupo reedland in dune hollow
- (b) Giant umbrella sedge-swamp millet sedgeland in dune hollow
- (c) *Eleocharis acuta-Isolepis prolifer*-jointed rush association in dune hollow
- (d) Manuka-kanuka shrubland on dunes



Kowhai Swamps N03/036

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

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



Landform/geology

Valley freshwater wetlands ponded by Holocene coastal dunes.

Vegetation

(a) Mainly raupo with *Baumea rubiginosa* and some scattered *B. articulata* and *Eleocharis sphacelata*.

(b) The upper part has small areas of giant umbrella sedge and swamp millet.

(c) The lower area contains *Eleocharis acuta*, *Isolepis prolifer* and jointed rush.

(d) A small area of manuka-kanuka shrubland occurs on the periphery. Mamaku, *Coprosma parviflora* and ti kouka are also present.

Fauna

Birds: Australasian bittern (Category O threatened species);

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

Significance

A narrow wetland system containing a diversity of wetland plant species contiguous with coastal habitat, an uncommon habitat type. Presence of threatened species and potential habitat for crakes and other wetland fauna (survey required).

Representative site for type (a) raupo reedland, type (b) giant umbrella sedge-swamp millet sedgeland and type (c) *Eleocharis acuta-Isolepis prolifer-Juncus articulatus* association. Only record of type (b) and (c) in the Ecological District.

POHUTUKAWA REMNANT

Survey no.	N03/037
Survey date	10 August 1995
Grid reference	N03 143 075
Area	55 ha (32 ha duneland, 23 ha shrubland)
Altitude	5-15 m asl

Ecological unit

(a) *Spinifex*-kanuka-pohutukawa association on dunes

(b) Kanuka-Sydney golden wattle shrubland on dunes

Landform/geology

Holocene coastal dunes and deflation zones.

Vegetation

(a) *Spinifex* is abundant on the dunes where pohutukawa and kanuka commonly occur. Harakeke, toetoe and oioi are frequent. Other species present are *Coprosma acerosa*, tauhinu, knobby clubrush, pohuehue, native iceplant, manuka, mingimingi, wattle, kikuyu, gorse, lupin and buffalo grass.

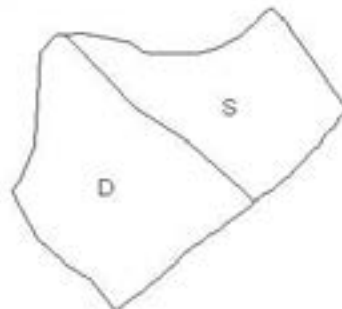
(b) Just over half of the site is kanuka shrubland in which Sydney golden wattle commonly occurs. Harakeke, toetoe, *Spinifex* and small pohutukawa are frequent. Ngaio, knobby clubrush, mature pohutukawa and lupin are occasional.



Pohutukawa Remnant N03/037

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

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



Fauna

Not surveyed.

Significance

A small remnant of what must have been an extensive pohutukawa forest along the west coast. A representative site for *Spinifex*-kanuka-pohutukawa which is only recorded from this site in the Ecological District.

Conservation Covenant protects 5.2 ha of this site and 2.41 ha is protected Stewardship Land both administered by the Department of Conservation.

HOUHORA HARBOUR

Survey no.	N03/038
Survey date	9 August 1995, 11 September 1995
Grid reference	N03 225 115
Area	1,534 ha (1,315 ha estuary, 219 ha shrubland)
Altitude	<2 m asl

Ecological unit

- (a) Mangrove-oioi association on estuary
- (b) Oioi saltmarsh on estuary
- (c) Glasswort herbfield on estuary
- (d) *Baumea* sp.-manuka swamp shrubland on sand flats
- (e) Eelgrass beds on sandy flats

Landform/geology

Estuary fringed predominantly by Pleistocene sands, but with rocky coast in the vicinity of Jackson's Point and between Green Point and the mouth.

Vegetation

(a) Abundant mangroves and oioi are common near the head of the harbour. On the margins manuka is frequent, and saltmarsh ribbonwood, *Isolepis* sp., *Juncus* sp., pampas and harakeke also occur.

(b) On the western side there is an extensive saltmarsh of oioi with sea rush and saltmarsh ribbonwood.

(c) Open areas of glasswort with *Samolus repens* and *Selliera radicans* are frequent.

(d) *Baumea* sp.-manuka association covers three quarters of the area between Jackson Point and Green Point. Kanuka, wattle, *Coprosma rhamnoides*, mingimingi, bracken and *Gleichenia* sp. are also present. The vegetation is a mosaic with islands of woody vegetation amongst sedges and dense kanuka. *Cassityba* is present throughout.

The area grades into the adjoining shrubland behind (N03/029).

(e) Beds of eelgrass are common throughout the tidal flats.

Fauna

Birds: Diversity of bird species with 45 species recorded including wrybill and northern NZ dotterel (both Category B threatened species), banded dotterel, variable oystercatcher, and white-fronted tern (all Category C threatened species), white heron, reef heron, Australasian bittern, and Caspian tern (all Category O threatened species), banded rail, spotless crane, and NI fernbird (all Regionally significant species). Other recorded bird fauna includes, bar-tailed godwit, pied oystercatcher, Australasian gannet, turnstone, lesser knot, terek sandpiper, Pacific golden plover, brown booby, and greenshank.

Lizards: 1992 record of Northland green gecko, a Northland endemic (Regionally significant species) and shore skink.

Aquatic fauna: black mudfish (Category C threatened species) recorded from the Houhora swamp in 1999.

Significance

Houhora Harbour provides excellent wader habitat with extensive shellbanks and mud flats. More than 3000 waders have been recorded at high-tide roosts. It



Houhora Harbour N03/038

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

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

is an important feeding area for international migratory waders, internal migrants and sedentary species, and is a vital link in the chain of estuaries from Rangaunu to Parengarenga.

Representative site for all five Ecological units.

Canada geese have increased over the years. They breed on the Mt Camel side of the harbour (V. Hensley pers. comm.), and if they continue to increase, they will pose a potential threat to dune lake/duneland communities, both flora and fauna (R. J. Pierce pers. comm.).

ARETHUSA SWAMP

Survey no. N03/039
 Survey date 10 August 1995
 Grid reference N03 205 085, N03 205 083, N03 204 081, N03 206 082
 Area 15.3 ha (1.6 ha forest, 4.7 ha shrubland, 9 ha wetland)
 Altitude 25-35 m asl



Arethusa Swamp N03/039

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



Ecological unit

- (a) *Baumea articulata*-*Eleocharis sphacelata* reedland in dune hollow
- (b) Open water
- (c) Sydney golden wattle-kanuka shrubland on gently sloping consolidated dunes

Landform/geology

Freshwater wetland ponded by Pleistocene consolidated parabolic dunes.

Vegetation

A freshwater wetland with many exotic plant species around it.

- (a) Most of the area is *Baumea articulata* and *Eleocharis sphacelata*. Raupo and harakeke are locally frequent. Papyrus is also present.
- (b) An area of open water contains water lilies.
- (c) Surrounding the wetland, Sydney golden wattle is emergent over kanuka. Manuka, brush wattle and black wattle occur frequently. A wide range of exotic plant species and other native planted specimens are present as well as frequently occurring kumarahou, mingimingi, mapou, *Pomaderris phyllicifolia*, turutu, *Lepidosperma laterale*, waterfern and bracken.

Fauna

Birds: Australasian bittern (Category O threatened species) reported. Spotless crane and Australasian little grebe (Regionally significant species), shining cuckoo, NZ kingfisher, pukeko and grey warbler are all year 2000 records by the OSNZ.

Significance

A sizeable wetland area providing habitat for threatened and regionally significant species and potentially banded rails and NI fernbirds. Arethusa Swamp is owned by the Royal Forest and Bird Protection Society, protecting 12.5 ha of this site.

EAST BEACH

Survey no.	N03/040
Survey date	23 August 1995
Grid reference	O03 330 023, N03 275 044
Area	627 ha
Altitude	0-10 m asl

Ecological unit

- (a) *Spinifex* grassland on foredunes
- (b) Knobby clubrush-oioi-pampas association in dune depressions

Landform/geology

Holocene coastal foredunes and deflation areas.

Vegetation

- (a) *Spinifex* is abundant. Pingao and open sand areas are frequent. Marram is present.



East Beach N03/040

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

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

(b) In dune depressions, knobby clubrush and oioi are common as is pampas and open sand. Kanuka, *Spinifex*, toetoe, lupin and *Coprosma acerosa* are frequent. Other species present are tauhinu, bottlebrush, gorse, prickly hakea, wattle, apple of Sodom, broom, kikuyu, pine and macrocarpa.

Significant flora

Austrofestuca littoralis (Declining) and pingao (Recovering-Conservation Dependent).

Fauna

Birds: Northern NZ dotterel and wrybill (both Category B threatened species), Caspian tern (Category O threatened species), variable oystercatcher (Category C threatened species), pied stilt, bar-tailed godwits and several common coastal bird species were recorded in a year 2000 OSNZ Aupouri Peninsula lake survey. Banded dotterel and white-fronted tern (both Category C threatened species) and SI pied oystercatcher have been recorded in previous surveys.

Marine reptiles: 1973 record of loggerhead turtles.

Significance

A major east coast beach utilised by threatened bird species for nesting and by large numbers of international and national migrant birds for roosting and feeding.

The foredune vegetation is primarily indigenous.

Representative site for *Spinifex* grassland.

An example of a nationally rare habitat type.

Approximately 92% of this site is protected. East Beach, 577.9 ha, is protected Stewardship Land and a small area of Marginal Strip, 0.4 ha, is included, both administered by the Department of Conservation.

WAIKOKOPU SHRUBLAND

Survey no.	N03/041
Survey date	18 January 1996
Grid reference	N03 090 195
Area	42 ha
Altitude	50-80 m asl

Ecological unit

Kanuka shrubland on dunes

Landform/geology

Holocene parabolic dunefield.

Vegetation

Shrubland comprising 2-3 m kanuka with frequent toetoe. Ngaio is common in the understorey.

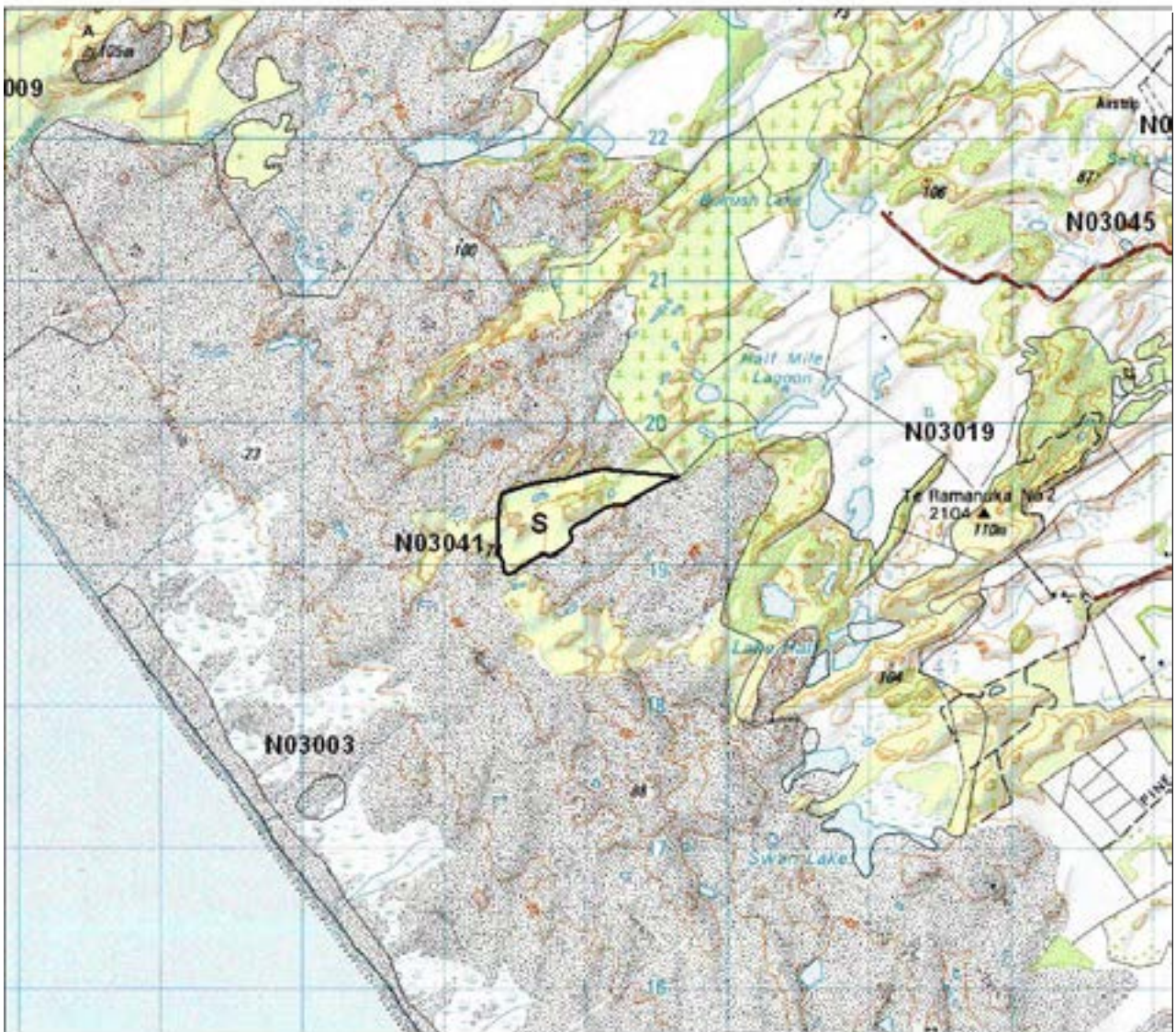
Fauna

Not surveyed.

Significance

A large area comprising a nationally rare habitat type largely devoid of exotic species and with an uncommon understorey type.

Representative site.



Waikokopu Shrubland N03/041

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

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

SALVATION RD SWAMP

Survey no.	N03/043
Survey date	17 January 1996
Grid reference	N03 193 099
Area	6.6 ha
Altitude	40 m asl



Salvation Rd Swamp N03/043

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

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

Ecological unit

- (a) *Eleocharis sphacelata* reedland in dune hollow
- (b) Open water

Landform/geology

Freshwater wetland on interdune flat of Pleistocene parabolic dunefield.

Vegetation

- (a) Almost all of the area is *Eleocharis sphacelata* with *Baumea articulata*.
- (b) Only a very small area of open water occurs.

Fauna

Birds: NZ dabchick (Category C threatened species), Australasian little grebe (Regionally significant species), black shag, pied shag, pied stilt, and other common waterbirds (recorded by OSNZ in 2000).

Significance

A sizeable wetland being suitable habitat for waterbirds including a threatened and regionally significant species, and part of a suite of wetlands in the Lambs Rd area.

Representative site for type (a).

LAMBS RD SWAMP

Survey no.	N03/044
Survey date	17 January 1996
Grid reference	N03 197 090, N03 194 091
Area	8.4 ha
Altitude	40 m asl

Ecological unit

(a) Open water

(b) *Baumea articulata*-*Eleocharis sphacelata* reedland in dune hollow

(c) *Eleocharis sphacelata* reedland in dune hollow

Landform/geology

Freshwater wetlands in interdune hollows on Pleistocene parabolic dunefield.

Vegetation

(a) Two small adjoining wetlands. Open water comprises 20% in one and 5% in the other.

(b) *Baumea articulata* and *Eleocharis sphacelata* are common in one.

(c) In the other, *Eleocharis sphacelata* is abundant and *Baumea articulata* frequent. Some raupo is also present.

Both are grazed to the margins.

Fauna

Birds: NZ dabchick (Category C threatened species), little shag and other common waterbirds were recorded by the OSNZ in early 2000. Black shag and pied shag have also been recorded.

Aquatic fauna: short-finned eel.

Significance

Part of a suite of wetlands in Lambs Rd, providing habitat for waterbirds including a threatened species.



Lambs Rd Swamp N03/044

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

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



SALT LAKE

Survey no.	N03/046
Survey date	18 January 1996
Grid reference	N03 132 217
Area	9.5 ha
Altitude	20 m asl



Salt Lake N03/046

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

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

Ecological unit

- (a) Open water in dune lake
- (b) Raupo reedland in dune hollow
- (c) Manuka shrubland in dune hollow

Landform/geology

Freshwater wetland on Pleistocene dunefield ponded by gully in Holocene parabolic dunes.

Vegetation

- (a) About 25% of the lake is open water.
- (b) More than half the area is raupo with occasional ti kouka.
- (c) Manuka shrubland with ti kouka occurs in the north-west arm.

Fauna

Birds: Common waterbirds.

Significance

A fenced area providing good habitat for waterbirds and other wetland species. Likely habitat for threatened species such as Australasian bittern and spotless crake. Further survey needed.

Salt Lake (3.4 ha or (35.7%) of this site) is protected Stewardship Land administered by the Department of Conservation.

TE WAKATEHAUA (THE BLUFF) ISLAND

Survey no.	N03/050
Survey date	1990, 1996
Grid reference	N03 010 240
Area	7.2 ha
Altitude	0-7 m asl

Ecological unit

- (a) Buffalo grass grassland on rock
- (b) Taupata shrubland on cliff margins
- (c) *Spinifex* grassland on low dune
- (d) Native iceplant turf on rock
- (e) *Dichondra* aff. *brevifolia*-native iceplant turf on rock
- (f) Glasswort turf on exposed rock faces

Landform/geology

Basaltic lava of Houhora complex, connected to the mainland by a sand tombolo.

Vegetation

- (a) Buffalo grass grows densely on the leeward side of the northern rock with occasional *Lachnagrostis billardieri*, knobby clubrush, *Lotus*, grasses and *Sonchus oleraceus*.
- (b) Dense stunted taupata are confined to cliff margins through which grows shore groundsel, *Senecio repangae* subsp. *repangae*, *Einadia trigonos*, shore bindweed and occasional tauhinu. *Hebe stricta* var. *macroura* occurs within this type.
- (c) *Spinifex* is dominant on a low dune covering most of the southern rock. Scattered shore bindweed, *Lachnagrostis billardieri*, *Zoysia pauciflora* and oioi occur here.
- (d) On the northern rock native iceplant forms a dense turf with occasional shore groundsel, *Selliera radicans* and *Lachnagrostis littoralis*.
- (e) The exposed summit is covered with native iceplant and *Dichondra* aff. *brevifolia*. The grass *Zoysia minima* occurs where the turf grades into the taupata shrubland.



Te Wakatehau Island (The Bluff) N03/050

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

(f) On exposed cliff faces of the northern rock are small tufts of glasswort. Associated species are *Samolus repens*, shore groundsel, *Crassula sieberiana* and *Einadia trigonos*.

Significant flora

Sonchus kirkii (true puha) (Declining) (probably extinct from this site), 1990 record of *Senecio regangae* subsp. *repangae* (Naturally Uncommon-Sparse). The site contains taxa which are uncommon in the Ecological District and close to their northern limits, i.e. *Hebe stricta* var. *macroua* (generally found south of Taranaki and Bay of Plenty).

Fauna

Variable oystercatcher and white-fronted terns (both Category C threatened species) and tattlers (sp.) recorded (R.J. Pierce pers. comm.).

Significance

Rocky habitats are scarce along Ninety Mile Beach and uncommon in the Ecological District.

Roosting and feeding area for threatened bird species.

Presence of several threatened and uncommon plant species and representative site for *Spinifex* grassland, taupata shrubland, native iceplant turf, *Dichondra* aff. *brevifolia*-native iceplant turf and glasswort turf.

This site description draws directly from de Lange (1996).

MOTU PURUHI ISLAND & TERAKAUTUHAKA ISLAND

Survey no.	N03/051
Survey date	1988, 1990, 1992, 1993
Grid reference	N03 252 162
Area	6.34 ha
Altitude	0-40 m asl

Ecological unit

- (a) Tawapou forest on gentle coastal slopes
- (b) Coastal shrubland on coastal slopes
- (c) Pohutukawa treeland on coastal cliffs
- (d) *Samolus repens*-glasswort turf on rock

Landform/geology

Altered volcanic rocks of the early Cretaceous Houhora complex.

Vegetation

- (a) Coastal forest 4-5 m tall occurs on Motu Puruhi Island and is dominated by tawapou with occasional mahoe, houpara and karo. The understorey is sparse with occasional *Asplenium flaccidum* subsp. *aurakiense*.
- (b) Shrubland 1.5-2.5 m tall occurs near the coastal edge and includes ti kouka, *Coprosma macrocarpa*, taupata, *Melicytus novae-zelandiae*, hangehange, pohuehue, harakeke, toetoe, bracken and sedges.
- (c) Pohutukawa are scattered around the cliffs.
- (d) Salt tolerant succulents are found in the splash zone.

Significant flora

Sicyos australis (Vulnerable) year 2000 record, and tawapou (Regionally significant species).

Fauna

Birds: 1990 record of Buller's shearwater (Category B threatened species), white-fronted tern (Category C threatened species), fluttering shearwater, little blue penguin, grey-faced petrels nesting. Reef heron, and Caspian tern (both Category O threatened species), black-winged petrel, pied shag.

Lizards: shore skink.