

degradation, both ecological units are representative types, as they are the last vestiges of forest on fertile alluvial soil in the study area.

KAIWHITU ISLAND

Survey no.	Q08/175
Survey date	12 January 2006
Grid reference	Q08 174 506
Area	2.6 ha (1.6 ha forest, 0.6 ha 'other', 0.3 ha shrubland)
Altitude	0–40 m asl

Ecological units

- (a) Pohutukawa-kowhai forest on steep coastal margin (40%)
- (b) Exotic grassland (26%)
- (c) Karaka-tawapou-harakeke forest on steep coastal margin (22%)
- (d) Mapou-manuka-harakeke shrubland on steep coastal margin (12%)

Landform/geology

Steep-sided islet formed of Miocene volcanoclastic gravelly sandstone (Waitakere Group)

Vegetation

Kaiwhitu Island lies in the inner Kaipara Harbour, approximately 350 m south of the nearest point on the Hukatere peninsula. It is a small, rounded, very steep island with a north-south saddle in the middle, covered in indigenous forest and shrubland. Shallow waters with a sandy bottom surround the island, which is a popular spot for flounder fishing.

- (a) On the eastern, land-facing, side of the island there is a forest of pohutukawa and kowhai with frequent karaka and occasional mamangi.
- (b) About quarter of the island is covered in exotic grassland in which the dominant species could not be identified from a distance.
- (c) The western side of the island supports a forest of karaka, tawapou and harakeke with frequent ti kouka.
- (d) On the southern side of the island the shrubland comprises equally dominant harakeke, mapou and manuka, and frequent pohutukawa, karaka, toetoe and kowharawhara.

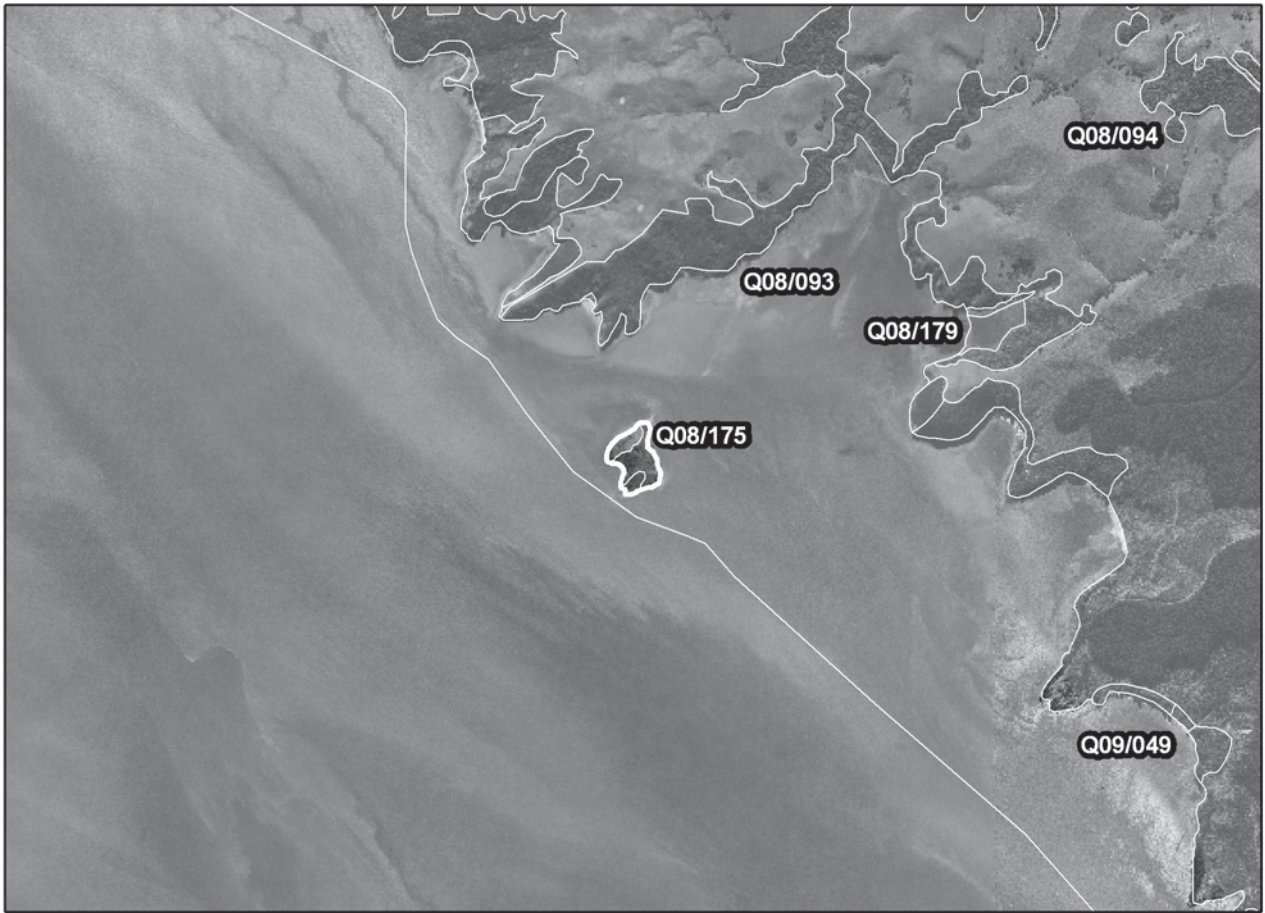
A 1993 survey recorded the island as possum-free and probably rat-free as well, as tawapou seed did not appear to be chewed (SSBI Q08/H056). Some interesting plant species were recorded which are not often noted in Otamatea ED Northland because they appear to be specific to exposed coastal environments, e.g. rengarenga lily, *Peperomia urvilleana* and native iceplant. There is also an unconfirmed record *Libertia ixioides* from this site (SSBI Q08/H056).

Significant flora

Tawapou (regionally significant).

Fauna

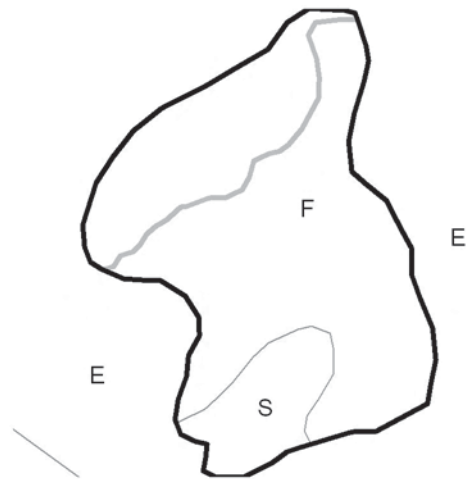
Fauna species were not surveyed during the present study, but a list of indigenous fauna recorded in 1993 includes the following bird species: little



Q08/175 Kaiwhitu Island

S = Shrubland
 F = Forest
 W = Wetland
 E = Estuarine

0 250 500 1,000 Metres



black shag (Sparse), kingfisher, welcome swallow, grey warbler, fantail and silveryeye. Fourteen indigenous landsnail species were present: *Austroiotula arewa*, *Basimocella* 'Nth maculata', *Delos coresia*, *Egestula egesta*, *Flammulina perdita*, *Mocella eta*, *Phenacohelix giveni*, *P. pilula*, *Phrixgnathus moellendorffi*, *Paralaoma caputspinulae*, *Sinployea parva*, *Therasiella cebnde*, *Tornatellides subperforata* and *Tornatellinops novoseelandica* (SSBI Q08/H056).

Significance

Kaiwhitu is one of nine small inner harbour islands surveyed in Otamatea ED Northland, and represents one of the most intact examples of these. This is one of only a few sites with some tawapou remaining in Otamatea ED Northland. Three representative ecological units occur on the island (a) pohutukawa-kowhai forest on steep coastal margin, (c) karaka-tawapou-harakeke forest on steep coastal margin and (d) mapou-manuka-harakeke shrubland on steep coastal margin. Karaka-tawapou-harakeke forest is a rare forest type in the Northland Region (Wendy Holland, pers. comm.). The site is also significant as a habitat for the threatened little black shag. It is also habitat for several non-threatened indigenous landsnail species. Kaiwhitu has some archaeological features in the form of shell middens and a rock wall, according to DOC records (SSBI Q08/H056).

KOHATUTAHI FOREST AND WETLAND

Survey no.	Q08/178
Survey date	14 December 2005
Grid reference	Q08 108 597 (2 remnants)
Area	3.8 ha (2.7 ha forest, 1.1 ha wetland)
Altitude	18–40 m asl

Ecological units

- (a) Kanuka-mamaku forest on gentle coastal margin (37%)
- (b) Raupo-*Baumea articulata*-pink bindweed reedland in small depression (28%)
- (c) Kowhai-*Coprosma areolata*-ti kouka forest on gentle coastal margin (20%)
- (d) Puriri treeland on gentle coastal margin (15%)

Landform/geology

Steep hillside and coastal fringe underlain by colluvium of basalt boulders.

Vegetation

Kohatutahi Forest and Wetland contains small areas of coastal broadleaved forest on a wet, bouldery, west-facing slope above coastal freshwater wetlands at the toe of the slope. The name suggests something about the nature of the place (kohatu = stone, tahi = one, joint). On the seaward side, the freshwater wetlands grade into mudflats (covered 100% by saltwater *paspalum*) and extensive, very tall mangrove forest. The landward side is surrounded by a radiata pine plantation. Many pine trees have been felled around the margins of the site, sometimes falling into the site. The site is divided into a northern area and a southern area, separated by 400 m of coastline. The northern part of the site was surveyed on foot.

(a) Viewing the harbour, it was determined that the southern forest remnant has a canopy dominated by kanuka and mamaku, with frequent taraire, puriri and kahikatea, and occasional kohekohe.

(b) The freshwater wetlands in the northern part are covered in raupo-*Baumea articulata* reedland with mats of pink bindweed vine covering over 20% of the surface area. Ti kouka and wheki are frequently emergent, and alligator weed, Yorkshire fog and bracken are frequent and dispersed throughout. Occasional



Q08/178 Kohatutahi Forest and Wetland

S = Shrubland
 F = Forest
 W = Wetland
 E = Estuarine

0 250 500 1,000 Metres



species include putaputaweta, karamu, manuka, *Muehlenbeckia australis*, knobby clubrush, oioi and purei (*Carex virgata*).

(c) Forest above the wetlands on the bouldery slope comprises a wide variety of species, three slightly more common than the others: kowhai, *Coprosma areolata* and ti kouka. Frequent canopy species include titoki, mapou, mamangi, karaka and puriri. Occasional canopy species include kahikatea, mamaku, rewarewa, *Coprosma macrocarpa*, *C. rhamnoides* karamu, mahoe, totara, kohekohe, taraire, kanuka and manuka. Many indigenous species were recorded in the understorey: kawakawa, hangehange, supplejack, pohuehue, *Haloragis erecta*, *Metrosideros perforata*, rasp fern, *Arthropteris tenella*,

leatherleaf fern, thread fern and *Oplismenus birtellus* subsp. *imbecilis*. Occasional exotic species were also recorded: umbrella sedge, paspalum, saltwater paspalum, lotus and narrow-leaved plantain.

(d) On flat, bouldery coastal terraces in the northern part there is an indigenous treeland in which puriri is the most common species. Karaka and titoki are frequent, with occasional kohekohe, ti kouka, *Coprosma areolata*, karamu, mapou, saltmarsh ribbonwood, radiata pine (recently planted) and maritime pine (wild).

In 1996 an unconfirmed record of *Coprosma rigida* (regionally significant) was made at this site (SSBI Q08/H063), however no herbarium specimens were collected at this time. During the current survey a range of *Coprosma* specimens were collected and found to be *C. rhamnoides* (which was not recorded on the 1996 list).

Fauna

Grey warbler, kingfisher, kukupa (Gradual Decline), fantail, silvereye, shining cuckoo, Australasian harrier. A morepork was present during the 1996 survey (SSBI Q08/H063).

Significance

This is a representative site for three ecological units: (a) kanuka-mamaku forest on gentle coastal margin, (b) raupo-*Baumea articulata*-pink bindweed reedland in small depression, and (c) kowhai-*Coprosma areolata*-ti kouka forest on gentle coastal margin. Two species which negatively affect the ecological function and natural character of the wetland are alligator weed and saltwater paspalum, which rapidly choke open water and preclude indigenous species from establishing, as well as reducing habitat for indigenous fauna. The use of the site by a threatened bird species (kukupa) increases its significance. In addition, colluvium of basalt boulders is found nowhere else in Otamatea ED Northland.

Two different protection statuses are afforded to parts of Kohatutahi Forest and Wetland. The Kohatutahi Marginal Strip (administered by DOC) covers 0.6 ha of ecological units (a) kanuka-mamaku forest, and (d) puriri treeland. The Kohatutahi Conservation Area (stewardship land administered by the Department of Conservation) covers 0.6 ha of ecological units (b) raupo-*Baumea articulata*-pink bindweed reedland, and (c) kowhai-*Coprosma areolata*-ti kouka forest. 2.6 ha (72 % of the site) is on private land.

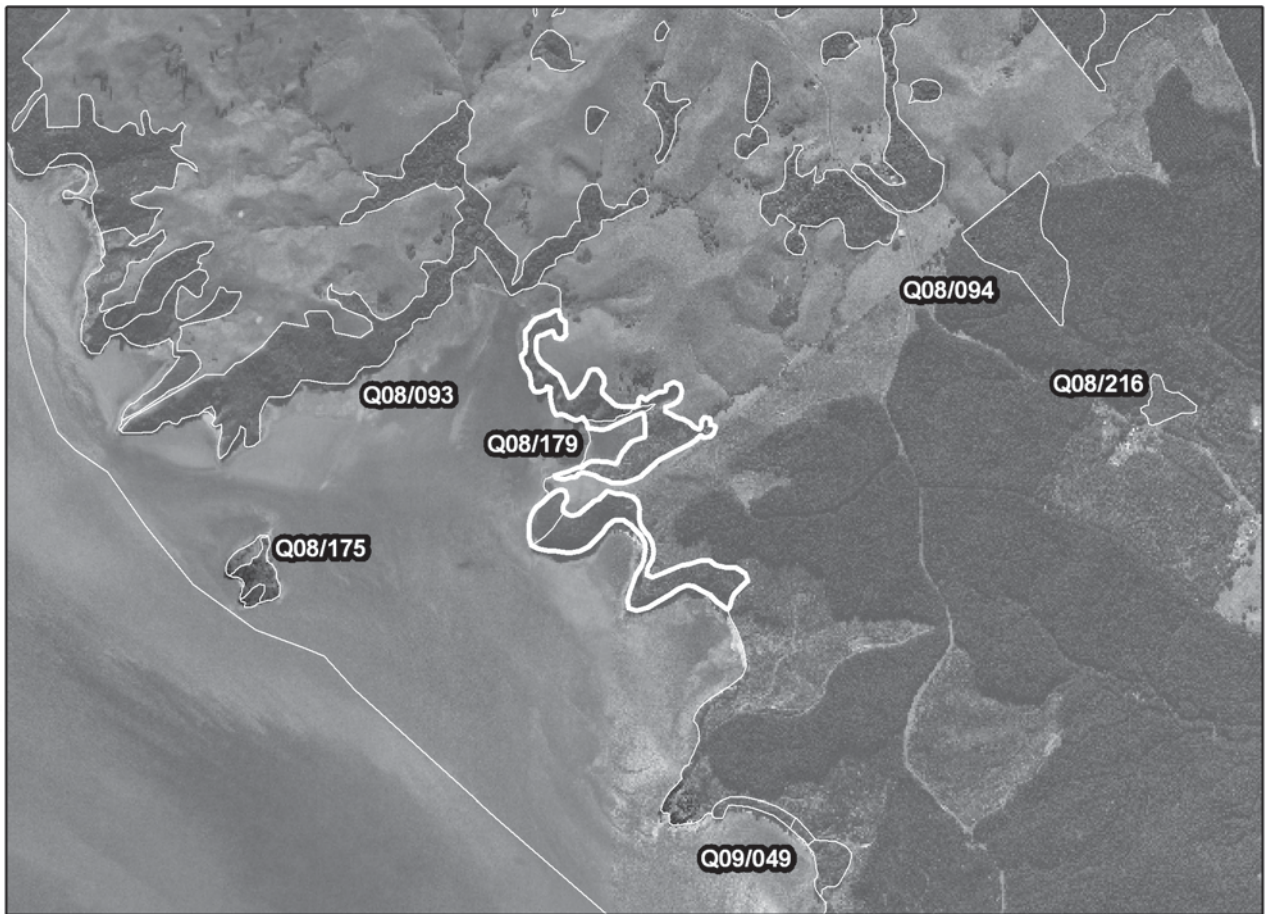
OWHAREAO POINT REMNANTS

Survey no.	Q08/179
Survey date	12 January 2006
Grid reference	Q08 186 510 (2 remnants)
Area	18.7 ha (16.9 ha forest, 1.3 ha shrubland, 0.5 ha wetland)
Altitude	0-60 m asl

Ecological units

(a) Houpara-kowhai forest on steep coastal margin (25%)

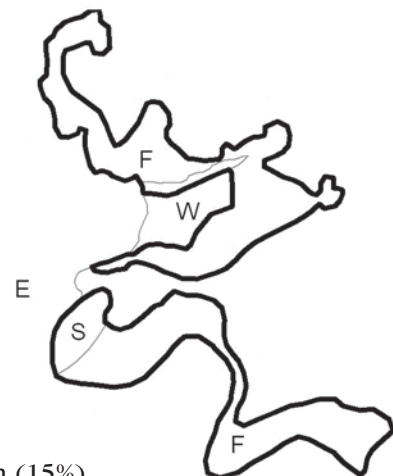
(b) Puriri-kowhai-kanuka forest on moderate to steep hillslope (20%)



Q08/179 Owhareao Point Remnants

S = Shrubland
 F = Forest
 W = Wetland
 E = Estuarine

0 250 500 1,000 Metres



- (c) Taraire forest on steep coastal margin (15%)
- (d) Kauri-kanuka forest on ridge top (15%)
- (e) Pohutukawa-radiata pine treeland on steep coastal margin (10%)
- (f) Kanuka-manuka shrubland on gentle coastal margin (7%)
- (g) Kanuka forest on moderate hillslope (5%)
- (h) Raupo-*Baumea articulata*-marsh clubrush reedland in gully (3%)

Landform/geology

Coastal hillsides underlain by Miocene volcanoclastic gravelly sandstone and basaltic lava flows (Waitakere Group).

Vegetation

Owhareao Point forms the southern side of Te Kiakia Bay on the western Hukatere peninsula coast. This site encompasses all indigenous vegetation on the main point, behind Otarawhai Bay, on a smaller point south of the bay, and extending approximately 500 m north and south of the points. The southern half of the site is bounded by a radiata pine plantation, and the northern half is next to pastoral farmland. A small creek runs into the bay on the north side of the point, and some mangroves also shelter in the saltwater zone (the only sizeable mangrove stand on the Hukatere Peninsula West Coast Q08/096). The flats at the river mouth have saltwater paspalum and alligator weed, and appear to have been reclaimed from mudflats (these are excluded from the site). A small freshwater wetland extends along the northern side of the flats.

(a) Forest on very steep coastal slopes in the south is composed of abundant houpara with common kowhai, frequent puriri, karaka and harakeke, and occasional pohutukawa, kanuka, karamu, ti kouka, nikau, *Coprosma rhamnoides*, mahoe, kiekie and gully tree fern.

(b) On slopes around the exotic grassland flats, there is forest dominated by puriri with common kowhai and kanuka. Karaka is frequent, with occasional pukatea, taraire, ti kouka, totara, kauri, nikau, kahikatea and pohutukawa.

(c) The southern side of the main point supports taraire forest with frequent puriri, karaka, kowhai and kanuka, and occasional kohekohe, nikau and tawapou.

(d) Prominent ridges in two places have kauri ricker stands with common kanuka.

(e) The very northern end of the site comprises scattered treeland with pohutukawa and radiata pine in equal proportions. Harakeke occurs frequently on the coastal fringe, with occasional ti kouka.

(f) On the northern side of both points there is shrubland comprising young manuka and kanuka with frequent houpara, harakeke and ti kouka. Some emergent radiata pine are present.

(g) A small area of kanuka forest with frequent kauri and mamangi is present near kauri-kanuka stands of type (d).

(h) The wetland vegetation is a mixture of three main species: raupo, *Baumea articulata* and marsh clubrush.

A 1977 New Zealand Wildlife Service survey recorded kawaka (Sparse) in this area (Q08/H044), but its continued existence at the site is not confirmed.

Significant flora

Tawapou (regionally significant).

Fauna

Black-backed gull, white-faced heron, pied shag (Sparse), tui, kingfisher.

Significance

The site is representative for three ecological units, which are all unique in Otamatea ED Northland: (a) houpara-kowhai forest on steep coastal margin, (c) taraire forest on steep coastal margin, and (h) raupo-*Baumea articulata*-marsh clubrush reedland in gully. Tawapou, a minor component of the coastal taraire forest (c), is a regionally significant plant species found at only a few sites in the Northland Conservancy part of the ED.

PUKEHAU QEII COVENANT

Survey no. Q08/182
 Survey date 9 December 2005
 Grid reference Q08 233 549 (2 remnants)
 Area 12.4 ha
 Altitude 0-47 m asl

Ecological units

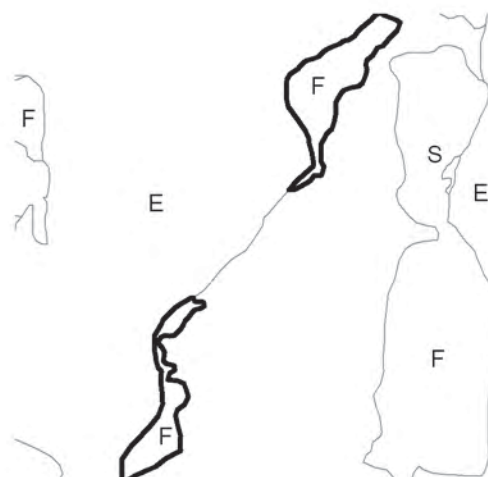
- (a) Totara-kowhai-kahikatea-puriri forest on gentle coastal margin (80%)
- (b) Totara-puriri forest on gentle coastal margin (20%)



Q08/182 Pukehau QEII Covenant

S = Shrubland
 F = Forest
 W = Wetland
 E = Estuarine

0 250 500 1,000 Metres



Landform/geology

Coastal hillsides underlain by Miocene volcanoclastic gravelly sandstone and basaltic lava flows (Waitakere Group).

Vegetation

The site comprises two indigenous coastal forest remnants on the western side of Puriri Point, which extends out into the Arapaoa River (Q08/084). The site abuts mangrove forest, saltmarsh, mudflats, coastal terraces, Pacific oyster beds and Pacific oyster farms on its seaward side, and pasture on its landward side.

(a) In the northern remnant the forest canopy comprises four main species, each occupying just over 20% cover: totara, kowhai, kahikatea and puriri. Frequent species include kauri, kanuka, ti kouka and radiata pine. Maritime pine and woolly nightshade occur occasionally.

(b) The southern remnant is not easily visible from public roads or from a boat on the harbour, however it could be determined that totara and puriri were the two main species in the canopy.

Significant flora

In 1992 a detailed flora and fauna list was prepared for the covenant as part of the covenant registration process. Three significant plant species were recorded: *Doodia mollis* (Sparse), *Olearia albida* (regionally significant) and *O. solandri* (regionally significant) (QEII National Trust records 1992; SSBI Q08/H047).

Fauna

Australasian harrier.

Kukupu (Gradual Decline) and ornate skink (regionally significant) were found using this area in recent times (SSBI Q08/H047).

Significance

Available information suggests that this site supports high biodiversity values of flora and fauna (several threatened and regionally significant species), especially in the fenced areas of the covenant, which have a dense understorey. This is a representative site for (a) totara-kowhai-kahikatea-puriri forest on gentle coastal margin. A QEII Open Space Covenant established in 1994 covers 9.6 ha of these forest remnants, as well as intervening grassland with scattered shrubs along the coast. This natural area also has significance as an archaeological site, with numerous shell middens dotted along the coast (QEII National Trust records 1992).

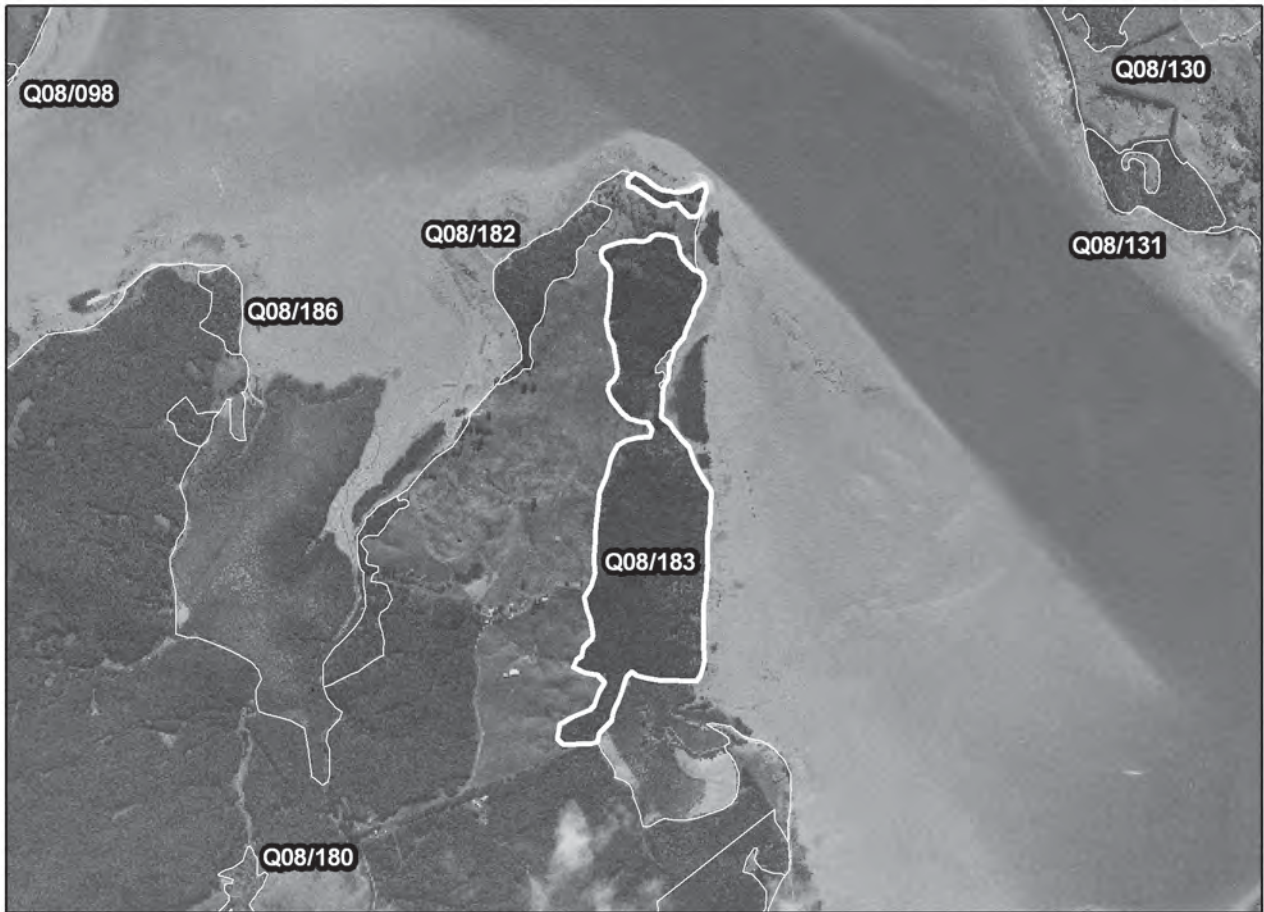
PURIRI POINT FOREST AND SHRUBLAND

Survey no.	Q08/183
Survey date	8 December 2005
Grid reference	Q08 239 548 (2 remnants)
Area	46.5 ha (46.2 ha forest, 0.3 ha shrubland)
Altitude	0–60 m asl

Ecological units

(a) Kanuka forest on moderate hillslope (50%)

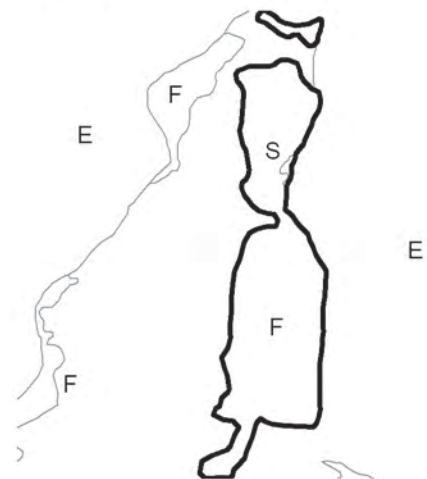
(b) Totara-kahikatea-ti kouka forest on ridge top (25%)



Q08/183 Puriri Point Forest and Shrubland

S = Shrubland
 F = Forest
 W = Wetland
 E = Estuarine

0 250 500 1,000 Metres



- (c) Kowhai-puriri-kahikatea forest on gentle coastal margin (12%)
- (d) Totara-kanuka forest on steep coastal margin (10%)
- (e) Puriri-karaka treeland on estuarine shell bank (2%)
- (f) Ti kouka shrubland on gentle coastal margin (1%)

Landform/geology

Coastal hillsides underlain by Miocene thinly interbedded mudstone and sandstone (Waitemata Group) and melange (undifferentiated Mangakahia & Motatau Complex lithologies).

Vegetation

This site encompasses indigenous vegetation on the northern and eastern sides of Puriri Point, which extends out into the Arapaoa River (Q08/084). Pastoral land abuts the site to the west, and mudflats and sandflats abut the site to the east.

- (a) Most of the inland forest is dominated by kanuka with frequent totara and ti kouka.
- (b) In the south, there is a ridge extending along the coast which has a low forest of abundant young totara with frequent ti kouka and kahikatea.
- (c) A southern finger of forest extending around a small bay comprises kowhai, puriri and kahikatea with frequent kanuka.
- (d) On the northern coast, totara-kanuka forest is the main vegetation type. Puriri is frequent, with occasional mamaku, nikau and radiata pine.
- (e) The northern tip of Puriri Point is a triangular shellbank. A stand of puriri and karaka trees is present, all of which are in poor condition and have been banded with metal, presumably to protect them from possum browse.
- (f) A tiny patch of ti kouka-dominant shrubland occurs on the east coast.

Fauna

Not surveyed.

Significance

Three of the ecological units present are unique and representative in Otamatea ED Northland (despite poor condition or small extent): (b) totara-kahikatea-ti kouka forest on ridge top, (e) puriri-karaka treeland on estuarine shell bank, and (f) ti kouka shrubland on gentle hillslope.

PAKAURANGI FOREST AND SHRUBLAND

Survey no.	Q08/185
Survey date	9 December 2005
Grid reference	Q08 260 520
Area	427.3 ha (162.1 ha forest, 265.2 ha shrubland)
Altitude	0-125 m asl

Ecological units

- (a) Kanuka-radiata pine shrubland on moderate to steep hillslope (61%)
- (b) Kanuka forest on moderate to steep hillslope (24%)
- (c) Puriri-kanuka forest on steep coastal margin (3%)
- (d) Totara-kowhai-puriri forest on steep coastal margin (3%)
- (e) Pohutukawa-radiata pine-kanuka forest on steep coastal margin (3%)
- (f) Pohutukawa-akepiro-kowharawhara forest on steep coastal margin (2%)
- (g) Pohutukawa treeland on coastal cliff (2%)
- (h) Kauri-kanuka forest on ridge top (2%)

Landform/geology

Coastal and inland hillslopes and gullies underlain by Cretaceous siliceous mudstone (Whangai Fmn, Mangakahia Complex); Oligocene calcareous