

PUKETOTARA FOREST REMNANTS 2

Survey no. Q09/005
 Survey date 9 November 2005
 Grid reference Q09 261 481 (3 remnants)
 Area 75.4 ha
 Altitude 20-149 m asl

Ecological units

(a) Kanuka-kahikatea forest on moderate hillslope (80%)



Q09/005 Puketotara Forest Remnants 2

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



- (b) Puriri-nikau-taraire forest in gully (10%)
- (c) Kauri-kanuka forest on moderate slope (5%)
- (d) Puriri-kahikatea forest on moderate hillslope (5%)

Landform/geology

Hillslopes and gullies underlain by Miocene polymict igneous conglomerate (Waitemata Group); Miocene muddy sandstone and volcanoclastic gravelly sandstone (Waitakere Group).

Vegetation

This site encompasses extensive secondary indigenous forest remnants in one of the northern catchments of Puketotara Peninsula, with two tributaries flowing northwards that meet near the coastline of the Funnel. It is very similar to Timber Bay Forest (Q09/001) in the neighbouring catchment to the east, although it contains more kanuka and kahikatea, and fewer kauri ricker stands. A considerable area on the western side, which includes the western stream gully (perhaps 40% of the site), has been ring-fenced within the last three years in order to exclude cattle (Tony Walden, pers. comm.). At the time of the site visit, cattle were heard lowing in the forest, indicating that the unfenced parts of the site are still grazed and trampled underneath.

- (a) Kanuka-kahikatea forest is the major forest type, occurring in all mid-slope locations, with kahikatea becoming more common towards the bottom of the slopes. At the upper margins of the site, this forest type generally abuts gorse-woolly nightshade scrub.
- (b) Puriri, nikau and taraire are common in gullies, with scattered pockets of pukatea, karaka and mamaku, and occasional titoki and kohekohe.
- (c) Dense kauri ricker stands occur on some ridge tops within the site, with occasional associated manuka, rewarewa and kahikatea.
- (d) Towards the lower end of the gully, where the coastal influence is stronger, there are puriri and kahikatea dominant stands with frequent kanuka and mahoe. Some of these puriri are in particularly poor condition, most likely due to possum browse.

Fauna

Australasian harrier, paradise shelduck.

Significance

The large size of these remnants, their ridge top to coastal margin sequence, and their role in riparian protection of two major streams on the peninsula afford them Level 1 significance. In addition, this site is considered representative for (b) puriri-nikau-taraire forest in gully and (d) puriri-kahikatea forest on moderate hillslope. These forest remnants have the potential to provide habitat for good populations of common forest birds (e.g. taraire and puriri, species which are important for kukupa, are common here), and may support indigenous geckos and skinks (though none have been found). No pest control is currently carried out and it is likely that a host of common mammalian pests is present, e.g. possums, rats, stoats, feral cats, etc. Grazing and trampling effects have begun to be addressed by recent fencing, which is a positive step towards restoring natural functions to these remnants.

PUKETOTARA FOREST REMNANTS 3

Survey no. Q09/006
 Survey date 9 November 2005
 Grid reference Q09 272 458 (12 remnants)
 Area 122.4 ha (119.5 ha forest, 2.9 ha wetland)
 Altitude 20-144 m asl



Q09/006 Puketotara Forest Remnants 3

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



Ecological units

- (a) Kanuka forest on moderate to steep hillslope (60%)
- (b) Taraire-puriri-kahikatea forest in gully (25%)
- (c) Kauri-kanuka forest on moderate hillslope and ridge tops (10%)
- (d) Raupo reedland in gully (5%)

Landform/geology

Hillslopes and gullies underlain by Miocene polymict igneous conglomerate (Waitemata Group); Miocene muddy sandstone and volcanoclastic gravelly sandstone (Waitakere Group).

Vegetation

This is a large area of secondary indigenous forest spread over multiple gullies and ridges leading south from the main axis of Puketotara Peninsula into a single stream gully. The forest does not extend to the coast, but ends at the head of a grazed freshwater wetland which flows out to the Oruawharo River (Q09/020).

- (a) The forest making up the main matrix of this remnant tends to be dominated by kanuka. Totara is the next most common tree, though never forming more than 20% of the canopy, and occasional mamaku, puriri, ti kouka, nikau, kauri, kahikatea, rewarewa and tarata were also noted.
- (b) The gully areas are dominated by taraire, puriri and emergent kahikatea, with frequent nikau, karaka and pukatea. Puka, tarata, tawa, rewarewa, mamaku, kohekohe and totara are also present in small quantities.
- (c) Dense kanuka and kauri rickers, some of which are shedding lower branches and taking mature form, cover a broad ridge at the northern end of the remnant, as well as several other smaller ridge tops. Tanekaha is an occasional associate.
- (d) Raupo reedland on the banks of the stream adjoins an area of saltmarsh and mangroves on the Oruawharo River.

Fauna

Grey warbler.

Significance

Most areas of this remnant are heavily grazed which may help to explain the dominance of kanuka, which is resistant to quite a high intensity of grazing. Despite the poor quality of the kanuka forest (a), this site does have particularly good and representative examples of (b) taraire-puriri-kahikatea forest in gully, (c) kauri-kanuka forest on moderate hillslope and ridge tops and (d) raupo reedland in gully. Due to their large size and diversity the forested areas in this site have the potential to provide habitat for good populations of common forest birds (in particular taraire and puriri are common in type (b); these species are important food for kukupa), and may support indigenous geckos and skinks (though none have been found). No pest control is currently carried out and it is likely that a host of common mammalian pests is present, e.g. possums, rats, stoats, feral cats, etc. The raupo reedland adjacent to the coast is the sixth largest in the Northland part of Otamatea ED Northland and is potential habitat for wetland birds such as spotless crane, marsh crane, banded rail and Australasian bittern, though none are known from here. Still, very little is known about the ecology of this large area.

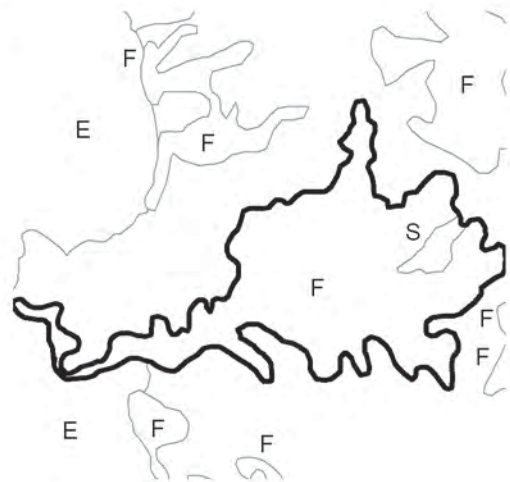
PUKETOTARA FOREST REMNANT 4

Survey no. Q09/008
 Survey date 9 November 2005
 Grid reference Q09 256 471
 Area 35.4 ha (34.1 ha forest, 1.3 ha shrubland)
 Altitude 0-120 m asl



Q09/008 Puketotara Forest Remnant 4

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



Ecological units

- (a) Kanuka forest on moderate to steep hillslope (58%)
- (b) Kauri-kanuka forest on ridge top (20%)
- (c) Puriri-nikau forest in gully (10%)
- (d) Manuka shrubland on gentle hillslope (5%)
- (e) Puriri-pohutukawa-kanuka treeland on steep coastal margin (5%)
- (f) Pohutukawa-kanuka treeland on steep coastal margin (2%)

Landform/geology

Hillslopes and gullies underlain by Miocene muddy sandstone, volcanoclastic gravelly sandstone and hyaloclastite tuff (Waitakere Group).

Vegetation

This site encompasses forest in a steep natural amphitheatre funnelling down to a narrowly forested stream mouth emptying into a small sandy bay. The forested coastal slopes on the westernmost point of Puketotara Peninsula are contiguous with the forest in the valley and are therefore included in this site. The site is approximately southwest-facing and sits opposite the Kaipara Harbour entrance within the influence of strong southwesterly winds.

- (a) The upper parts of the remnant have a canopy of mainly kanuka, with scattered emergent kauri rickers, and occasional tarata, tanekaha and ti kouka. Mapou is common on the fringes with pasture.
- (b) On elevated ridges dense forest of kauri rickers and kanuka is present. These stands contain local tanekaha and pohutukawa, and occasional karaka, kowhai, rewarewa and tarata.
- (c) The gullies are predominantly forested in puriri and nikau, with frequent pukatea, kahikatea, karaka and occasional kohekohe.
- (d) An area of manuka shrubland occurs on a flat ridge in the upper catchment, from which grazing animals appear to have been recently excluded.
- (e) The more sheltered south-facing coastal slopes have puriri-pohutukawa-kanuka treeland.
- (f) The exposed coastal slopes on the point have pohutukawa-kanuka treeland.

Fauna

Not surveyed.

Significance

This forest remnant is of a considerable size compared with most others in the Otamatea ED Northland (one of the top 30) and is relatively compact in shape. It protects most of a small stream catchment and the steep slopes of a prominent point on Puketotara Peninsula. It has a high diversity of habitat types ranging from ridge top to gully bottom and out to the coast. It is grazed underneath and is probably suffering a lack of regeneration of palatable species. The whole site is representative of a coastal vegetation sequence from ridge top to gully bottom on Waitakere Group geological units.

MOTUROA ISLAND

Survey no. Q09/013
Survey date 9 December 2005
Grid reference Q09 248 454
Area 1.6 ha
Altitude 0-20 m asl

Ecological unit

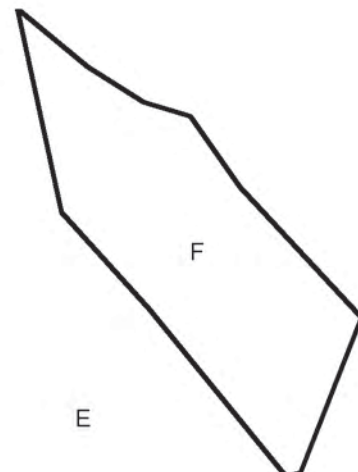
(a) Pohutukawa treeland on steep coastal margin (100%)



Q09/013 Moturoa Island

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

0 250 500 1,000 Metres



Landform/geology

Steep-sided islet formed of Miocene hyaloclastite tuff (Waitakere Group), connected to the mainland by a spit at low tide.

Vegetation

Moturoa is a small, steep, elongated island stretching north-west to south-east, approximately 250 m offshore of the Puketotara Peninsula, but connected to the mainland by tidally exposed sandflats. Scattered pohutukawa cling to the southwest-facing slope. None are healthy and perhaps >50% appear to be dead or moribund. Frequent harakeke, kowharawhara, mapou houpara and manuka are present, with occasional akepiro and ti kouka. A solitary radiata pine stands on the island's crest. A plant species list compiled by DOC in 1993, records 33 indigenous and 8 exotic species (SSBI Q09/H020). The condition of the treeland appears to have deteriorated since then, as no mention was made at that time of severe pohutukawa dieback.

Fauna

The 1993 survey recorded pied shag (Sparse), kingfisher, welcome swallow and silveryeye. Four landsnail species were also found in 1993: *Thalassobelix ziczag*, *Mocella eta*, *Delos coresia* and *Austroiotula arewa* (SSBI Q09/H020).

Significance

The effects of possum browse on pohutukawa are more extreme here than on the nearby peninsular coast, and without timely intervention in the form of possum control they are likely to die off rapidly. In such a state of decline this ecological unit cannot be considered a good example of its type, though it is one of only a few island-based pohutukawa stands remaining in Otamatea ED Northland. If possums have access to the island, no doubt other invasive mammalian pests are also present, which reduces the potential habitat value of the island to indigenous fauna, such as nesting sea birds. Pied shag (Sparse) was recorded, elevating this site to Level 1 significance.

MOTUOUHI ISLAND

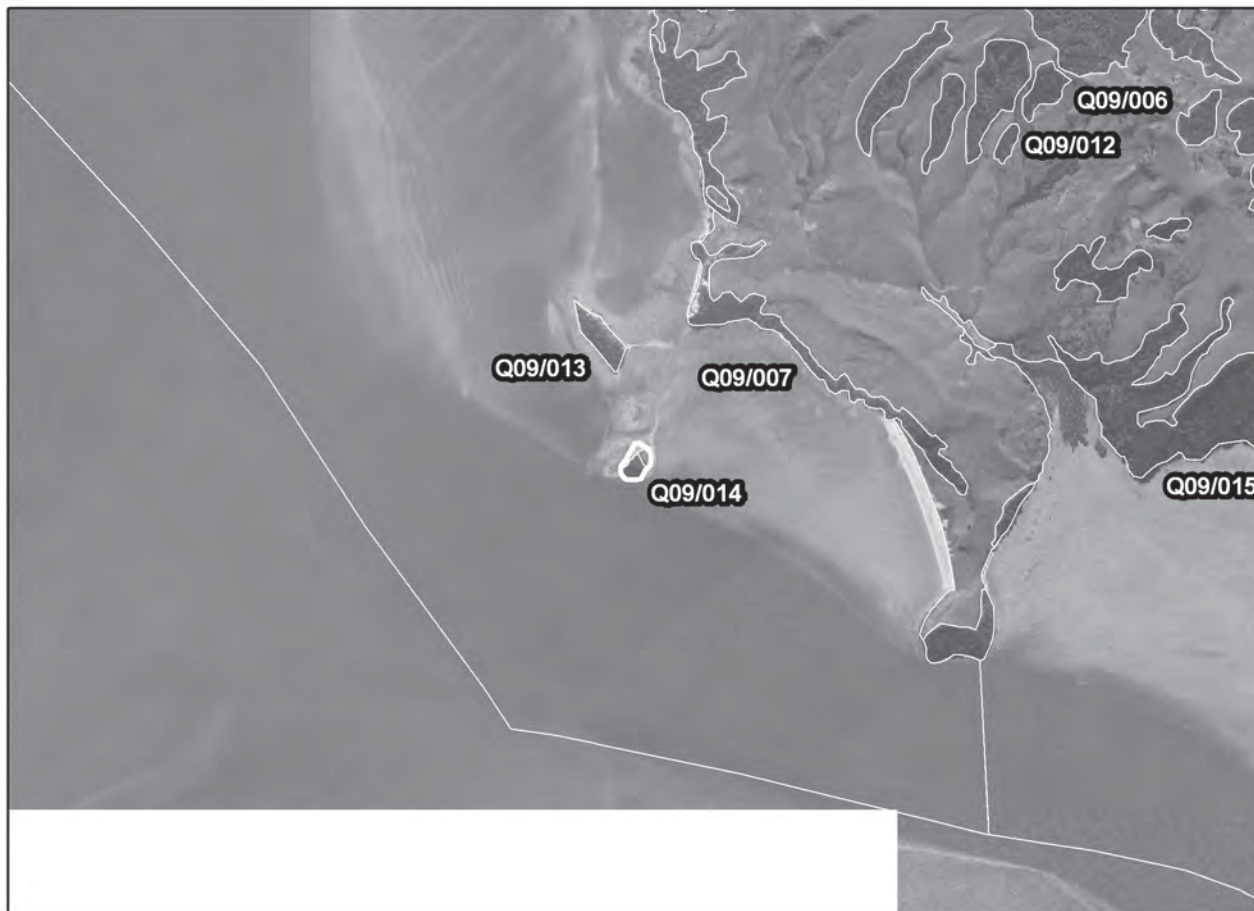
Survey no.	Q09/014
Survey date	9 December 2005
Grid reference	Q09 249 450
Area	0.9 ha (0.5 ha forest, 0.2 ha shrubland, 0.2 ha other vegetation)
Altitude	0-20 m asl

Ecological units

- (a) Pohutukawa forest on coastal cliff (50%)
- (b) Exotic grassland on coastal cliff (30%)
- (c) Gorse and mixed indigenous scrub on steep coastal margin (20%)

Landform/geology

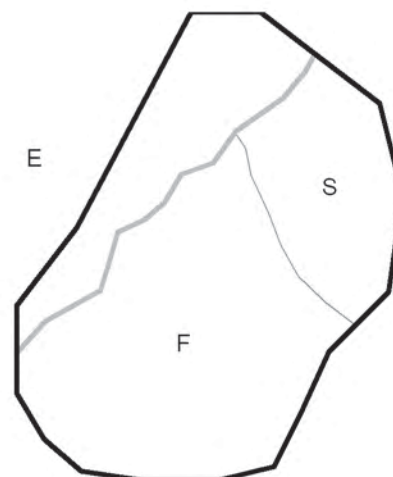
Steep-sided islet formed of Miocene hyaloclastite tuff (Waitakere Group), connected to the mainland by a spit at low tide.



Q09/014 Motuouhi Island

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

0 250 500 1,000 Metres



Vegetation

Motuouhi is a small, steep island approximately 400 m off the southwest coast of Puketotara Peninsula, connected to the mainland by estuarine sandflats and shellbanks which are exposed at low tide.

(a) The south-facing cliff has a good canopy of healthy, mature pohutukawa with frequent kowharawhara and *Coprosma macrocarpa*, and occasional mapou and houpara.

(b) Exotic grassland with scattered gorse bushes occurs on the northwest-facing cliff.

(c) Gorse is the most common plant in the scrub on the eastern side of the island, but other frequent components of this community are *Coprosma macrocarpa*, mamangi and mapou, and there are occasional ti kouka, hangehange and mingimingi.

A survey in 1993 recorded 24 indigenous and 14 exotic plant species, and observed that the island was recovering from past clearance (SSBI Q09/H019).

Fauna

Not surveyed during the present study. Little shag, kingfisher and silvereye were recorded here in 1993. Five landsnail species were also recorded: *Mocella* sp., *Austroiotula arewa*, *Phenacobelix pilula*, *Delos coresia* and an indeterminate Punctidae sp. (SSBI Q09/H019).

Significance

The difference in pohutukawa condition between this site and neighbouring Moturoa Island (Q09/013) is striking, with most pohutukawa trees on Motouhi Island showing new growth throughout their crowns. This may be because this site is further from the mainland and less accessible to terrestrial pest animals at low tide (though it still has a shallow sandbar leading out to it). This site is representative for pohutukawa forest on coastal cliff (a), as it is the best example of such vegetation on an island in Otamatea ED Northland, though small in extent.

PUKETOTARA FOREST REMNANT 9

Survey no.	Q09/016
Survey date	30 November 2005
Grid reference	Q09 281 458
Area	19.8 ha
Altitude	20-120 m asl

Ecological units

- (a) Kanuka forest on moderate hillslope (50%)
- (b) Puriri-taraire forest on moderate to steep hillslope (35%)
- (c) Kauri-kanuka-tanekaha forest on moderate hillslope (15%)

Landform/geology

Hillslopes and gully underlain by Miocene polymict igneous conglomerate and gravelly sandstone (Waitemata Group).

Vegetation

This site comprises a medium-sized, relatively compact indigenous forest remnant with a good edge to centre ratio. It skirts the steep head of a gully draining southwest into the wetland of Puketotara Forest Remnants 3 (Q09/006).

(a) Kanuka forest occurs throughout half the area, particularly on edges and at the lower end. There is frequent mamaku, and occasional tanekaha, mamangi, puriri, lancewood and ti kouka in the canopy.

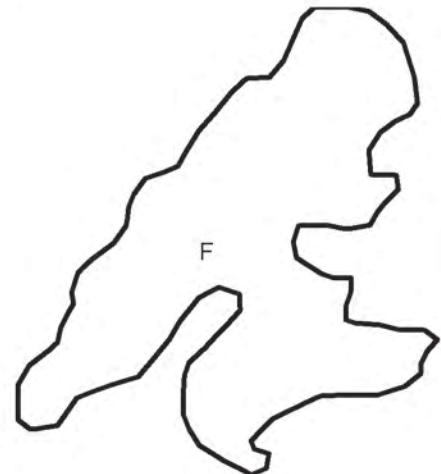
(b) On the steep southeast-facing slope there is a mixture of puriri and taraire with frequent pukatea, rewarewa and kanuka, and occasional titoki, kohekohe and kahikatea.



Q09/016 Puketotara Forest Remnant 9

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

0 250 500 1,000 Metres



(c) Kauri rickers emerge above a canopy of kanuka and tanekaha on a well-drained slope facing northwest, with frequent kahikatea and puriri.

Fauna

Grey warbler.

Significance

This site is representative for (b) puriri-taraire forest on moderate to steep hillslope. It is in relatively healthy condition, compared to other remnants of its size on Puketotara Peninsula, and also has high canopy species richness and a high diversity of habitat types for its size.

PUKETOTARA FOREST REMNANTS 10

Survey no. Q09/017
Survey date 30 November 2005
Grid reference Q09 288 477 (3 remnants)
Area 14.6 ha (14.5 ha forest, 0.1 ha wetland)
Altitude 0–40 m asl

Ecological units

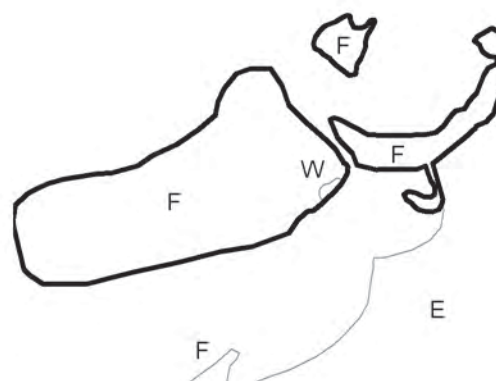
(a) Totara–kanuka forest in gully (98%)



Q09/017 Puketotara Forest Remnants 10

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

0 250 500 1,000 Metres



- (b) Open water (constructed freshwater farm pond) (1%)
- (c) *Carex virgata*-pampas tussockland on constructed pond fringe (1%)

Landform/geology

Hillslopes and gully underlain by Miocene thinly interbedded sandstone and mudstone (Waitemata Group).

Vegetation

This site encompasses a relatively large, rectangular block and two smaller remnants of forest and wetland in a stream gully flowing eastwards from Timber Bay Forest (Q09/001). The riparian forest is adjacent to mangrove forest in the Whakaki River, however it is dissected by a major farm track near the coastal end. The biggest remnant appears fenced to exclude livestock.

- (a) Totara-kanuka forest extends along the small stream. The conical spars of young kahikatea are frequently emergent above the canopy near the stream banks. There is a relatively diverse group of associated canopy species, none of which exceed 5% overall cover, including kowhai, mahoe, kauri, mamangi, puriri, tarata, tanekaha, ti kouka, karaka, kohekohe and heketara. Mapou and rangiora occur on edges.
- (b) A small farm pond occurs at the farm track edge, probably induced by a culvert, and is bordered by luxuriant, tall forest on its the western side.
- (c) The forest edge of the pond supports a marginal vegetation community of isolated *Carex virgata* and pampas tussocks.

Fauna

Tui.

Significance

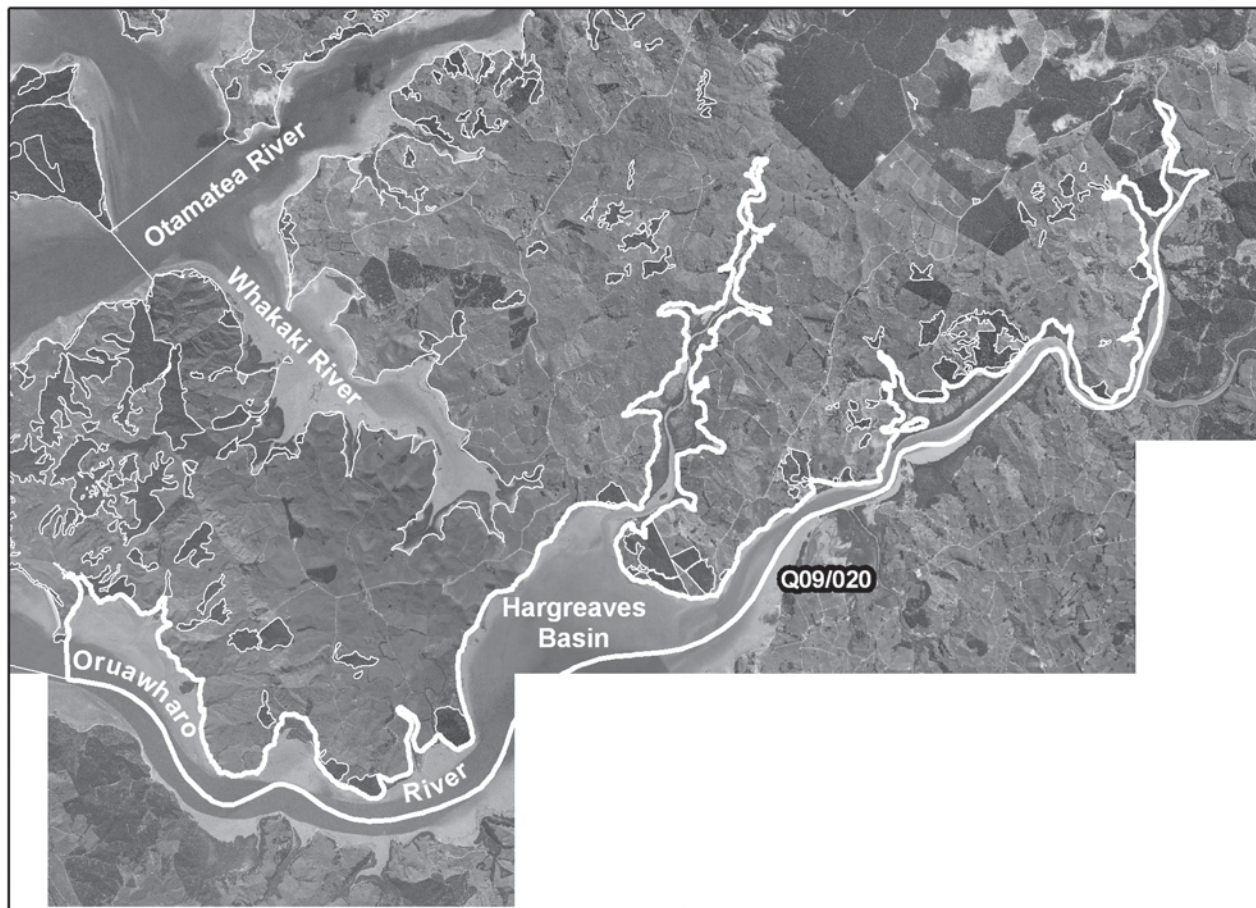
This is one of the more diverse examples of totara-kanuka gully forest (a) in Otamatea ED Northland, and is therefore considered representative. The site is small, but it is obviously habitat for some common forest birds and provides a partial corridor from Timber Bay Forest (Q09/001) to the coast (it is separated by at least 100 m from the former, however). Although this is the only site where *Carex virgata* was recorded with a high amount of cover, the total vegetation cover it is not sufficiently extensive or intact to be a representative community.

ORUAWHARO RIVER NORTH COAST

Survey no.	Q09/020
Survey date	Various (December 2005 - January 2006)
Grid reference	Q09 338 453
Area	1984.1 ha
Altitude	sea level

Ecological units

- (a) Mangrove shrubland and forest in estuary
- (b) Sea rush rushland in estuary
- (c) Mangrove-sea rush shrubland in estuary
- (d) Oioi-sea rush rushland in estuary



Q09/020 Oruawhoro River North Coast

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

0 1,250 2,500 5,000 Metres



- (e) Glasswort-*Suaeda novae-zelandiae*-sharp rush herbfield on shellbank
- (f) Sea primrose-remuremu-saltwater paspalum-sharp rush herbfield in estuary
- (g) Saltmarsh ribbonwood shrubland in estuary
- (h) Saltwater paspalum grassland in estuary
- (i) *Spartina alterniflora* grassland in estuary
- (j) Mudflats and sandflats in estuary

Landform/geology

Holocene estuaries, beaches, and intertidal rock flats.

Vegetation/habitats

(a) Mangrove shrubland and forest is common in the Kaira Creek and from approximately Oruawhoro School Forest (Q09/033) northwards, in the more

sheltered regions of the river, occupying approximately 349 ha (18% of the site).

(b) Stands of pure sea rush are the most common type of saltmarsh. Kaira Creek contains the largest examples of this type.

(c) Where mangrove shrubland and sea rushland meet there is often a mingling of the two over several metres of upper-tidal mudflat, creating habitat with cover for species such as banded rail (which may be present in the estuarine margins).

(d) In some places oioi and sea rush are equally common. This is generally at freshwater outflows (e.g. next to Oruawharo Road Forest Q09/033) or above the pure sea rush rushlands.

(e) At the southern side of Gittos Point Forest and Shrubland (Q09/032) there are shellbanks holding tidepools which are populated with scattered glasswort, *Suaeda novae-zelandiae* and sharp rush around their edges.

(f) Tiny areas of indigenous salt meadow are present. The main indigenous herbs are sea primrose and remuremu, and occasionally bachelor's button. However, the invasive saltwater paspalum and sharp rush are also quite common.

(g) Saltmarsh ribbonwood occurs at the extreme upper tidal limit, with various mixtures of indigenous and exotic species. The following were recorded as occasional associates in this type: *Coprosma propinqua*, harakeke, ngaio, mapou, periwinkle, Japanese honeysuckle, gorse, woolly nightshade. Tiny scattered examples of this type are present.

(h) Saltwater paspalum is present in most saltmarsh areas of Oruawharo River North Coast, and can form extensive grasslands, through which indigenous salt meadow herbs often grow, e.g. sea primrose, bachelor's button, remuremu. It does not tend to occur on more exposed, sandy beaches. This type generally occurs in quiet tidal inlets above mangrove forests and shrublands.

(i) Two sites of *Spartina alterniflora* grassland are present on this coast, both on the southern side of Puketotara Peninsula. Both infestations are in the process of being eradicated by the Northland Regional Council (Peter Joynt, pers. comm.).

(j) Mudflats and sandflats are somewhat less extensive on the north coast of the Oruawharo River than they are on the Otamatea River (Q08/062) or the Arapaoa River (Q08/084) (695 ha). The river is narrower than either of the aforementioned sites, and only the north coast is within Otamatea ED Northland. The largest area of shallow wading habitat is present on the southern side of the Puketotara Peninsula, especially in the bay behind Schnapper Point.

Significant flora

Suaeda novae-zelandiae (regionally significant) occurs in this site (AK 294744).

Fauna

This site is important to several bird species. Some are listed below, based on records appearing in Crockett (1992–2004), in which counts for 'Oneriri' roughly equate to the Puketotara Peninsula coast (lower Oruawharo River). Counts were often 'nil' at this site (no birds present, or not counted), so all records are sporadic, therefore the species below are listed simply as present.

- Pied shag, black shag (both Sparse)
- Pied stilt, pied oystercatcher, white-faced heron, black-backed gull (all not threatened)

In addition to these records, white-faced heron were abundant in January 2006; 20–30 observed on shellbanks in the bay behind Schnapper Point. Bar-tailed godwits (Migrant) were also observed flying up and down the Oruawharo River.

Significance

A recent review of shorebird habitat networks deemed the Kaipara Harbour to be a ‘site of particular importance’ for NZ shorebirds, as it is within the top five non-breeding sites for seven species of indigenous-breeding shorebirds, and is also used by 1000+ Arctic migrants during summer months (Dowding & Moore 2006). This site contains 14% of the wading habitat in Otamatea ED Northland. This is a representative site for ecological unit (e), glasswort-*Suaeda novae-zelandiae*-sharp rush herbfield on shellbank, which is particularly unique as it contains a regionally significant plant species (*Suaeda novae-zelandiae*). This species was only recorded at one other site in this survey (Tinopai foreshore on Otamatea River Confluence (Q09/021)).

The Kaira Creek Marginal Strip covers small areas of ecological unit (b) at the upper tidal limit. The Oruawharo River Marginal Strip covers the edge of a reclaimed mudflat. In total, 10.1 ha of Marginal Strip overlap with the estuarine habitats in this site. These are administered by DOC.

OTAMATEA RIVER CONFLUENCE

Survey no.	Q09/021
Survey date	Various (December 2005–January 2006; Wildland Consultants 2002)
Grid reference	Q09 243 479
Area	1878.0 ha
Altitude	sea level

Ecological units

- (a) Mangrove shrubland and forest in estuary
- (b) Oioi-sea rush rushland in estuary
- (c) Sea primrose-remuremu-saltwater paspalum-sharp rush herbfield in estuary
- (d) Saltmarsh ribbonwood shrubland in estuary
- (e) Mudflats and sandflats in estuary

Landform/geology

Holocene estuaries, beaches, and intertidal rock flats. On both sides of the site there are geologically significant Miocene shore platforms (Kenny & Hayward 1996).

Vegetation/habitats

The Otamatea River Confluence area is a zone of fast water movement with extensive sandy beaches, mudflats and rock platforms (some of which are human-modified), and very little marginal vegetation.