

shore opposite, as well as further north and south along the same coast. The surrounding landscape is pasture/gorse and mangrove forest.

(a) The majority of the forest canopy comprises totara and kanuka in equal proportions with frequent emergent kauri and kahikatea. There are occasional puriri, kowhai, ti kouka and kawaka, as well as mature emergent macrocarpa and radiata pine. There are some stands of senescent manuka with a groundcover of tangle fern (Julia Walker pers. comm.).

(b) Forest on the true right bank comprises totara (abundant) and kowhai (common) with occasional ti kouka.

(c) One large area of recently regenerating shrubland is dominated by manuka, with frequent kanuka and occasional ti kouka.

Significant flora

According to 2005 ground-based survey, this site contains two threatened plant species, mida (Gradual Decline) and kawaka (Sparse), a regionally significant plant species, *Coprosma crassifolia*, and two locally uncommon plant species, mangeao and tawa (Julia Walker, pers. comm.)¹¹.

Fauna

Not surveyed.

Significance

The site contains the best representative example of manuka shrubland (c) in Otamatea ED Northland, and is also significant for the presence of threatened, regionally significant and locally uncommon plant species. 1 ha of the site is within the Paparoa Creek Marginal Strip No. 2 (administered by DOC).

LOWER PAHI RIVER FOREST REMNANTS

Survey no.	Q08/103
Survey date	18 November 2005
Grid reference	Q08 228 641 (6 remnants)
Area	49.4ha
Altitude	0–100 m asl

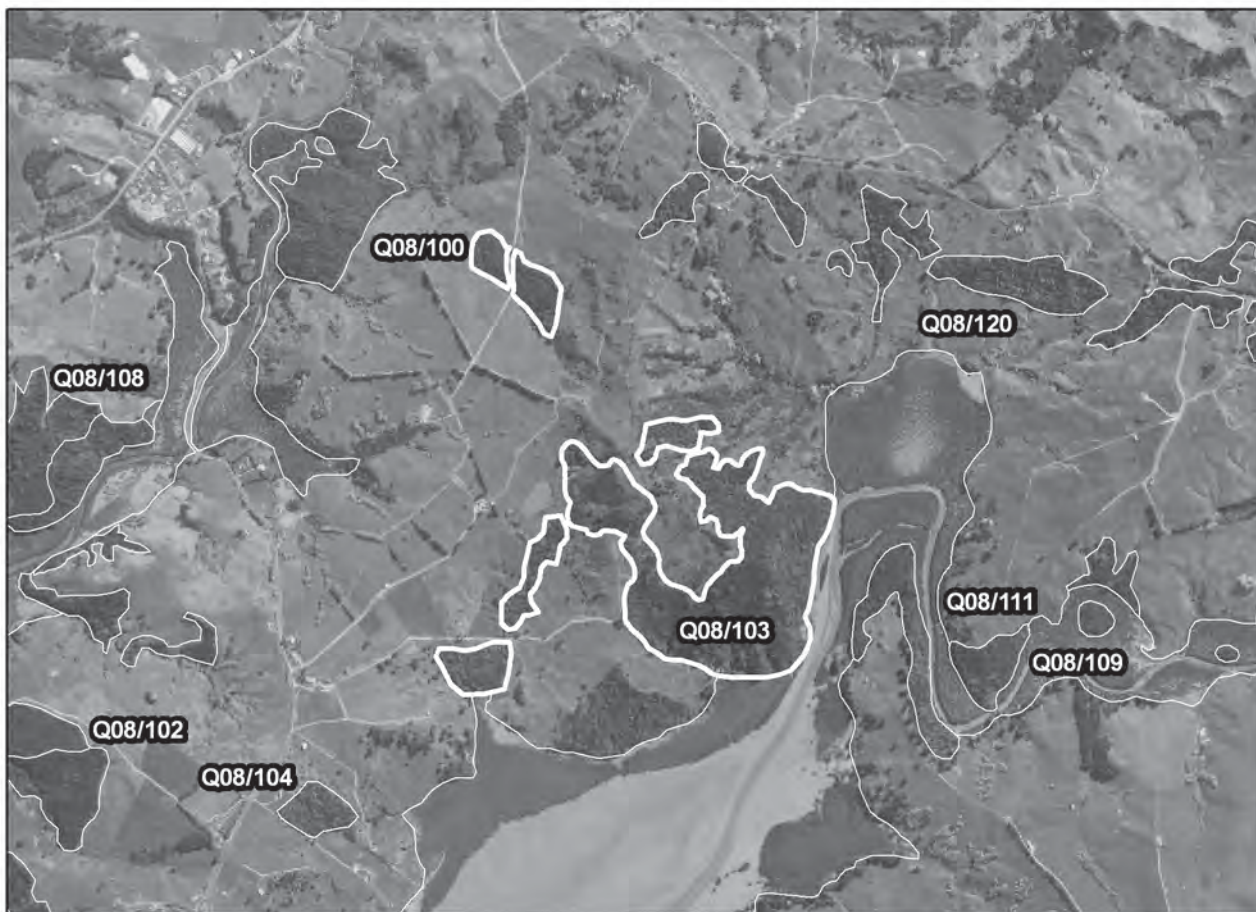
Ecological units

- (a) Totara-kanuka forest on moderate to steep hillslope (50%)
- (b) Totara-kanuka-kahikatea forest on moderate to steep hillslope (35%)
- (c) Totara-puriri-kowhai forest on gentle coastal margin (10%)
- (d) Karaka-kowhai-tree privet forest on steep coastal margin (5%)

Landform/geology

Hillslopes and gullies underlain by undifferentiated Eocene–Oligocene mudstone, sandstone and bioclastic limestone (Motatau Complex), and melange (undifferentiated Mangakahia & Motatau Complex lithologies).

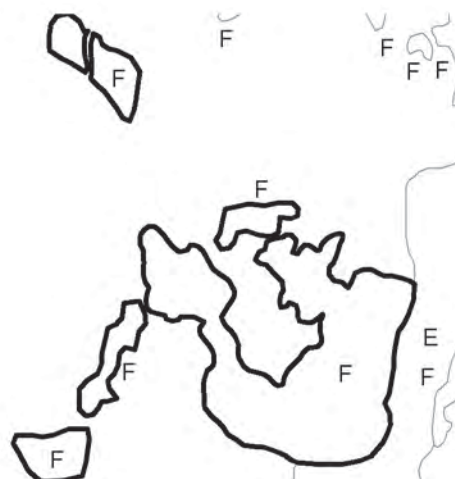
¹¹ Kawaka was recorded at grid reference Q08 208 635. Seedlings and saplings were abundant, but concentrated in one small area of the forest. *Coprosma crassifolia* was recorded at grid reference Q08 204 637 (on the southwestern side of the headland), on the edge of the older forest in the Marginal Strip (Julia Walker 2005, pers. comm.).



Q08/103 Lower Pahi River Forest Remnants

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

0 250 500 1,000 Metres



Vegetation

The site comprises six large indigenous forest remnants on the western side of the Pahi River surrounded by pastoral farming land. Near the site, a substantial area of coastal totara-kahikatea forest¹² has been cleared within the last three years, leaving only occasional totara and kahikatea standing. This area was not included within the site.

¹² The area cleared was approximately 7.7 ha and was located southwest along the coast from the Scenic Reserve.

(a) The majority of the remnants are totara-kanuka forest with scattered emergent radiata pine. Some very large pines are present on the south-facing slopes of the largest remnant.

(b) The next most frequent vegetation type, is a more diverse mixture of equally abundant totara, kanuka and kahikatea with frequent kowhai, taraire and kauri rickers, and occasional puriri, nikau, karaka, rewarewa, rimu and matai.

(c) In the southwestern corner, totara, puriri and kowhai are equally abundant in the canopy,

(d) An area of karaka forest with large kowhai and tree privet in the canopy occurs next to the coast. Totara and tawa are frequent, and nikau, matai, rewarewa, mangeo and radiata pine are occasional. This area is predominantly within the Lower Pahi River Scenic Reserve.

Significant flora

Tawa and mangeo are locally uncommon in Otamatea ED Northland.

Fauna

Kingfisher and little shag. Kukupa (Gradual Decline) were observed in the Scenic Reserve.

Significance

This site is significant as a habitat for a threatened bird species (kukupa). It is also significant as a coastal site for tawa (locally uncommon) and as one of only three sites where mangeo (locally uncommon) was recorded in Otamatea ED Northland (the others are Takahoa Creek Forest (Q08/163) and Paparoa Creek Marginal Strip No. 2 and Surrounds (Q08/102)). This a representative site for three ecological units: (b) totara-kanuka-kahikatea forest on moderate to steep hillslope, (c) totara-puriri-kowhai forest on gentle coastal margin and (d) karaka-kowhai-tree privet forest on steep coastal margin. Many goats were observed in the Scenic Reserve, and a woody weed, elaeagnus, is smothering vegetation along the coastal fringe. This site contains the twelfth largest extent of forest habitat in Otamatea ED Northland, however it is divided into six separate remnants, which reduces its value compared to other sites of a similar size. The Lower Pahi River Scenic Reserve (DOC-administered) makes up a very small part of the total area of this site (1.4%, 0.5 ha).

PAHI COASTAL STRIP

Survey no.	Q08/105
Survey date	17 November 2005
Grid reference	Q08 205 612
Area	39.3 ha (37.4 ha forest, 1.9 ha shrubland)
Altitude	0-60 m asl

Ecological units

(a) Totara-kanuka forest on gentle coastal margin (95%)

(b) Kanuka-manuka shrubland on gentle hillslope (5%)

Landform/geology

Coastal hillslopes underlain by Eocene thickly bedded glauconitic sandstone (Omahuta Sst, Motatau Complex). Well exposed coastal cliffs showing close



Q08/105 Pahi Coastal Strip

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

0 250 500 1,000 Metres



juxtaposition of two different late Eocene–Oligocene sequences in different blocks within Northland Allochthon. Superb Bortonian flysch (Kenny & Hayward 1996).

Vegetation

This is a relatively large natural area of secondary forest and shrubland on the western shore of the Pahi peninsula, on gentle slopes leading down to mudflats and scattered mangroves on the Arapaoa River (Q08/084). Much of the surrounding land on the peninsula is currently in residential housing or baches, or is in small lifestyle blocks with pasture and exotic trees.

(a) Totara-kanuka forest with frequent ti kouka and emergent old radiata pine is the main vegetation type. Also present in the forest are karaka, puriri and occasional clumps of large macrocarpa. Wild hedges of elaeagnus are a problem along the coastal fringe where they can extend 10 m over the ground right down to the water's edge. Other problem weeds include Mexican devil, Mexican daisy, brush wattle and pampas.

(b) A small stand of kanuka-manuka shrubland is present at the top of the remnant near Pahi Road. Within this shrubland there are occasional totara, kahikatea, rewarewa, mamangi and large emergent radiata pine.

Significant flora

Olearia solandri (regionally significant) was recorded in a survey in 1999 (SSBI Q08/H066).

Fauna

Little shag (present study), white-faced heron, black-backed gull, shining cuckoo, kingfisher, fantail, grey warbler (SSBI Q08/H066).

Significance

This is a representative site for ecological unit (a). Despite being a relatively large area of forest, this site is compromised by weed infestations (especially elaeagnus) and grazing. Nevertheless, it does provide an important protective buffer to the Arapaoa River (Q08/084), especially with land and housing development occurring on all sides. It is also habitat for a regionally significant plant species, *Olearia solandri*. The exposed coastal cliffs and adjacent shore platforms are considered to be regionally significant in terms of geology (Kenny & Hayward 1996).

NORTH WHAKAPIRAU FOREST REMNANT

Survey no.	Q08/107
Survey date	17 November 2005
Grid reference	Q08 221 606
Area	5.9 ha
Altitude	9-99 m asl

Ecological unit

(a) Totara-kohekohe-puriri forest on steep coastal margin (100%)

Landform/geology

Coastal hillslopes underlain by Oligocene micritic limestone (Mahurangi Limestone, Motatau Complex).

Vegetation

This site comprises forest on a south-facing, steep coastal slope bordering mangrove forest and pasture, including some reclaimed land. The vegetation is very distinctive, as three species are equally common in the canopy (totara, kohekohe and puriri), one of which, kohekohe, is unusual in its abundance. Karaka is frequent, and tarata and ti kouka are occasional associates in the canopy.

Fauna

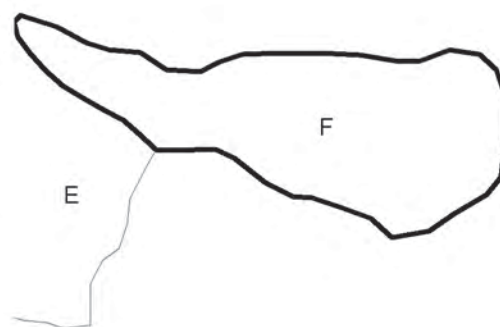
Not surveyed.



Q08/107 North Whakapirau Forest Remnant

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

0 250 500 1,000 Metres

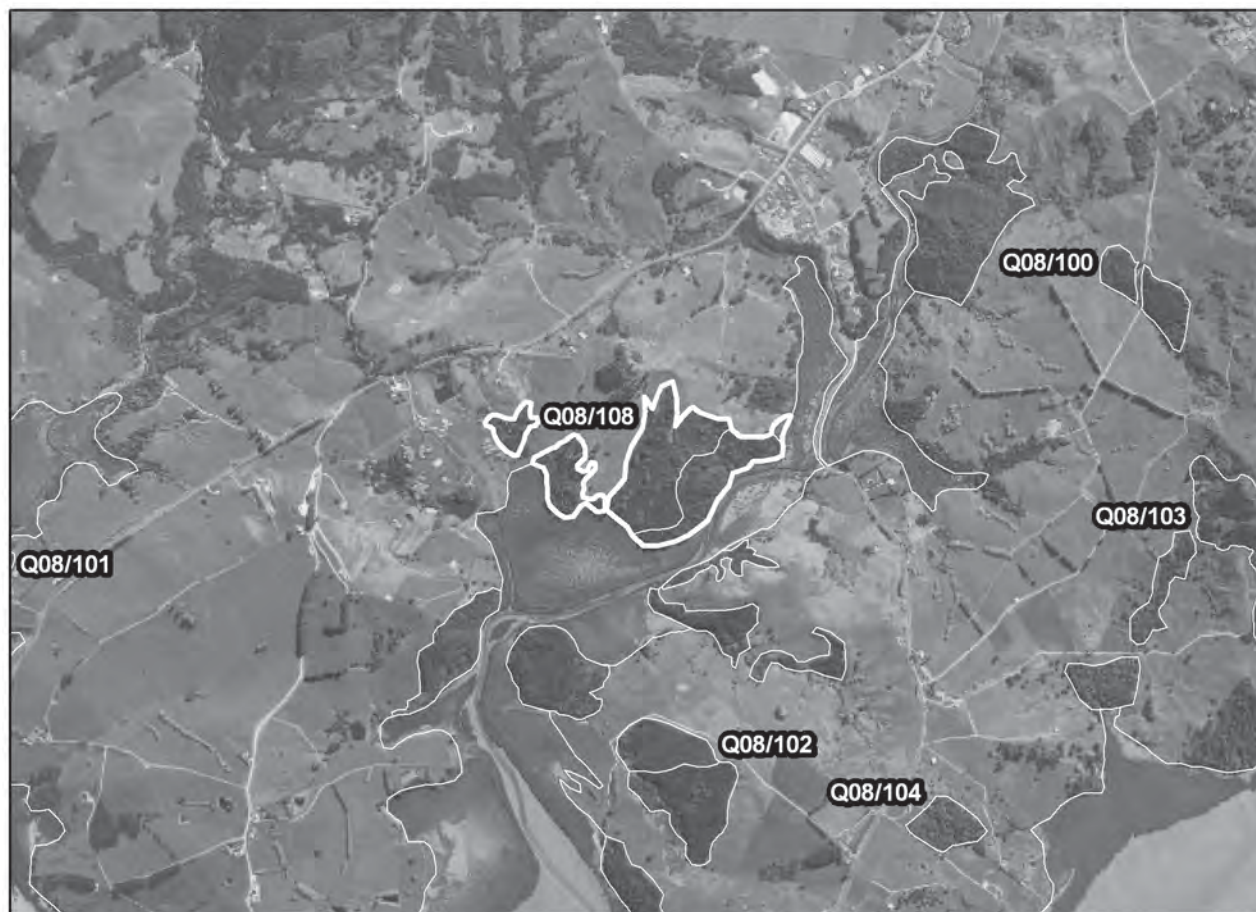


Significance

This forest is the only example of its type in Otamatea ED Northland and is therefore a representative ecological unit. The distinctive feature of the vegetation is the high proportion of kohekohe in the canopy. Some kohekohe appear to be suffering from canopy dieback (probably possum browse) and management action to prevent further damage is an immediate issue. Grazing is also a problem, as the site is not fenced. If mammalian pest control is carried out this site has good potential as kukupa habitat.

PAPAROA CREEK SCENIC RESERVE AND SURROUNDS

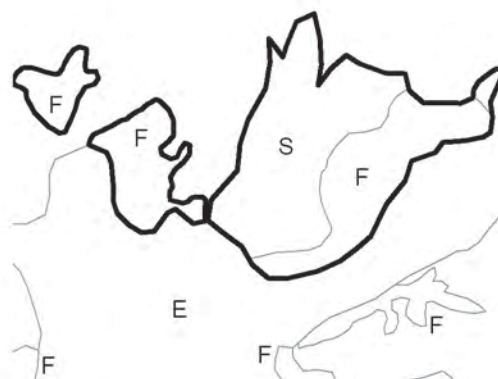
Survey no. Q08/108
Survey date 17 November 2005
Grid reference Q08 206 644 (3 remnants)
Area 20.6 ha (10.8 ha forest, 9.8 ha shrubland)
Altitude 0-58 m asl



Q08/108 Paparoa Creek Scenic Reserve and Surrounds

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

0 250 500 1,000 Metres



Ecological units

- (a) Totara-kanuka forest on steep coastal margin (52%)
- (b) Manuka-kanuka shrubland on moderate to steep hillslope (46%)
- (c) Mahoe shrubland on steep coastal margin (2%)

Landform/geology

Coastal hillslopes and gullies underlain by Cretaceous sandstone and mudstone (Mangakahia Complex).

Vegetation

The site comprises three indigenous forest/shrubland remnants on the western side of the Paparoa Creek..

- (a) Totara-kanuka forest is present in the two smaller remnants and along the coastal margin. Emergent kauri rickers and tanekaha occur frequently in this type. Also present are ti kouka, kahikatea, mamaku, nikau, karaka and rimu. A stand of mature podocarps (kahikatea, rimu and totara) over kanuka appears to be within the boundary of the Scenic Reserve.
- (b) The other common vegetation type is manuka-kanuka shrubland. Emergent mature radiata pine is scattered throughout the shrubland, as is mamaku. Emergent maritime pine is also present in localised groves.
- (c) A very small patch of shrubland dominated by mahoe is present adjacent to the coast. Mamaku and ti kouka are frequent in the canopy with occasional kanuka, mapou, gorse and Japanese honeysuckle.

Fauna

Not surveyed.

Significance

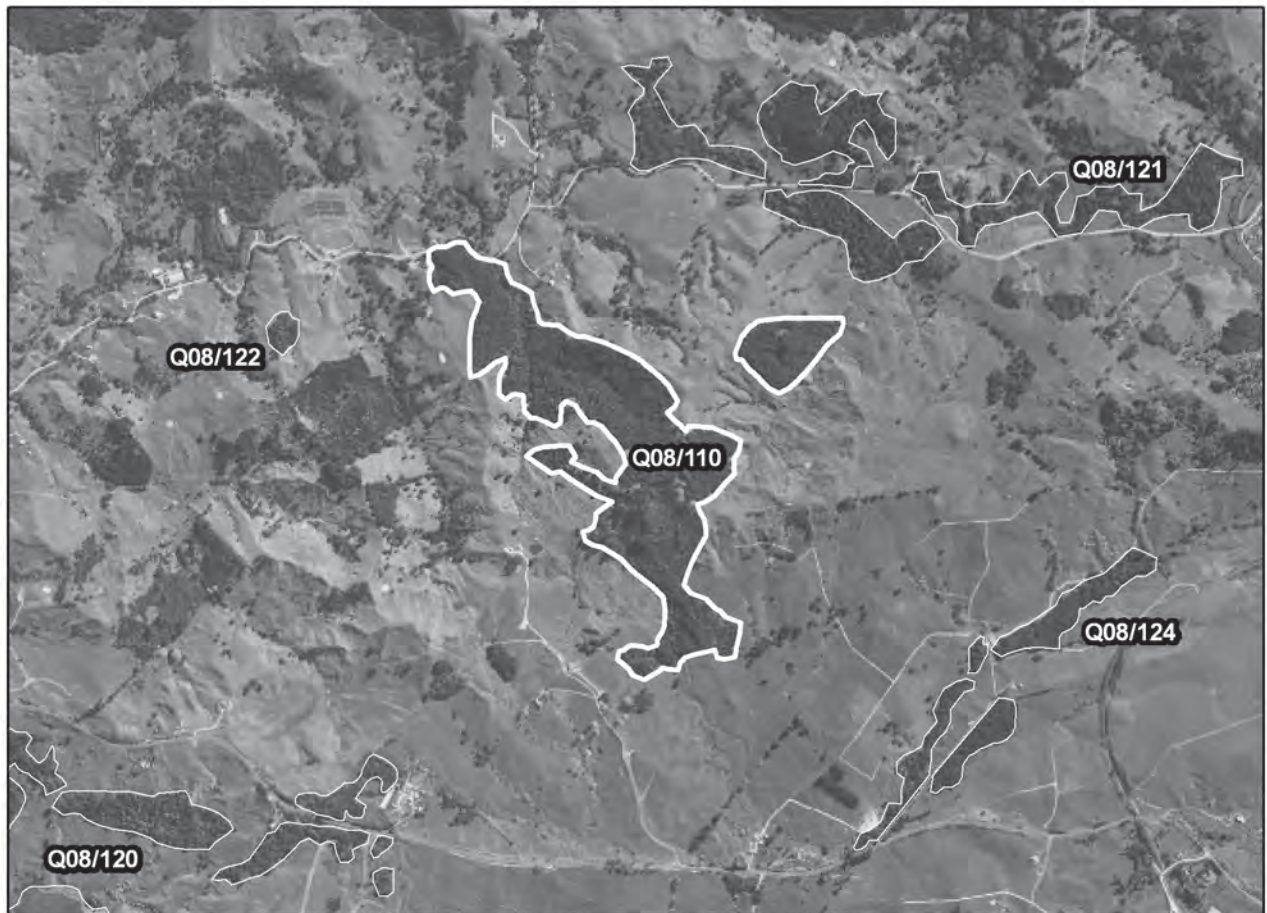
This site comprises the seventh largest example of indigenous shrubland in Otamatea ED Northland. However this shrubland is not entirely indigenous in character with many radiata pine and maritime pine trees emergent above the canopy. The site is not fenced, and suffers ongoing degradation from stock grazing and trampling. Ecological unit (c), mahoe shrubland on steep coastal margin, is a unique and representative shrubland type in Otamatea ED Northland. A small part of this site (0.9 ha) is within the Paparoa Creek Scenic Reserve administered by the Department of Conservation.

PAPAROA STREAM HEADWATERS

Survey no.	Q08/110
Survey date	24 November 2005
Grid reference	Q08 256 662 (2 remnants)
Area	52.5 ha
Altitude	34-140 m asl

Ecological units

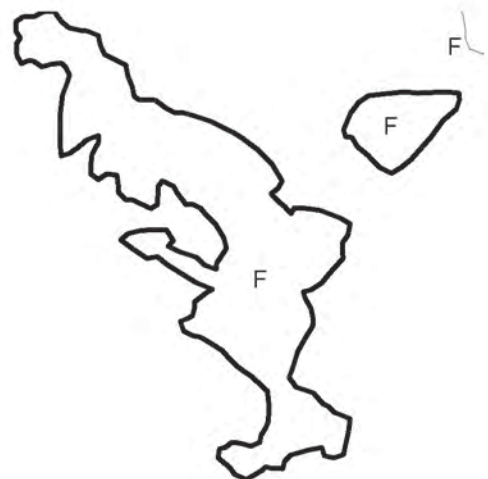
- (a) Taraire-totara forest on moderate to steep hillslope (68%)
- (b) Rimu-kanuka forest on gentle hillslope (20%)
- (c) Kahikatea-totara forest in gully (10%)
- (d) Mamaku-totara forest on moderate to steep hillslope (2%)



Q08/110 Paparoa Stream Headwaters

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

0 250 500 1,000 Metres



Landform/geology

Hillslopes underlain by Cretaceous sandstone and mudstone (Mangakahia Complex), and melange (undifferentiated Mangakahia & Motatau Complex lithologies).

Vegetation

This site comprises one large, forest remnant, and one smaller one on undulating topography at the headwaters of the Paparoa Stream. Most of the

large remnant is difficult to see from roads, and the vegetation type could not be described during this study. This area was described in a 1995 survey as 'mainly broadleaf, dominated by taraire'. A previous study by the NZ Wildlife Service (1977) described totara and taraire as the main canopy species. Hence it was determined that the areas that could not be seen were similar to the visible areas of totara-taraire forest, and that this was the major forest type present.

(a) A relatively even canopy of taraire in humid places and totara in drier places has frequent emergent trees of pukatea, rewarewa and kahikatea, with occasional nikau and macrocarpa.

(b) In the northern part of the remnant, dense young rimu are emergent above a canopy of kanuka. Also frequent in the canopy are kauri rickers, totara and tanekaha. Occasional species recorded include rewarewa, kahikatea, ti kouka, manuka and macrocarpa.

(c) Gully forest in the south of the remnant is composed principally of kahikatea and totara with occasional tarata.

(d) On a moderate to steep southeast-facing slope at the highest point of the remnant there is secondary forest (probably a landslide scar) of mamaku and totara. Rewarewa, kanuka and large radiata pine are frequent, and occasional rimu.

Significant flora

Kaikomako (regionally significant) was recorded at this site in 1995, along with miro and tawa (both locally uncommon in Otamatea ED Northland) (SSBI Q08/H015).

Fauna

Grey warbler, kingfisher, shining cuckoo. Kukupa (Gradual Decline) (SSBI Q08/H015).

Significance

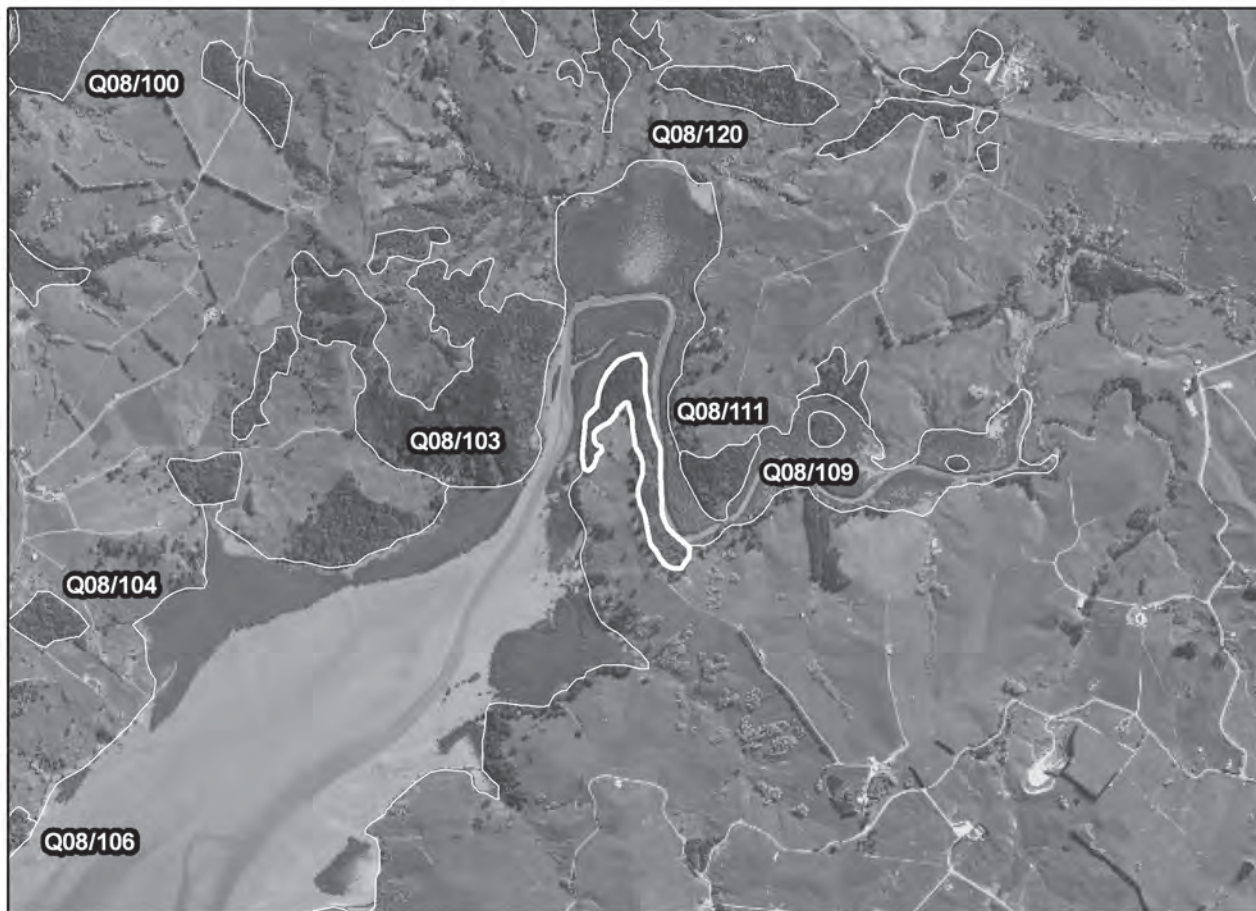
Parts of the site are heavily grazed underneath, however other parts have healthy understoreys, according to 1995 DOC records (SSBI Q08/H015). The current condition is not known. This is the eleventh largest forest area in Otamatea ED Northland, and is one of the most intact. It is representative for all of the ecological units present. Threatened (kukupa) and regionally significant (kaikomako) species are present. A pa site is present at the crest of the hill within this site (SSBI Q08/H015). Two QEII Open Space Covenants cover parts of this natural area (in total 13.7 ha, mostly of (a) taraire-totara forest on moderate to steep hillslope).

MOONEY QEII COVENANT

Survey no.	Q08/111
Survey date	18 November 2005
Grid reference	Q08 235 637
Area	7.2 ha
Altitude	0-29 m asl

Ecological unit

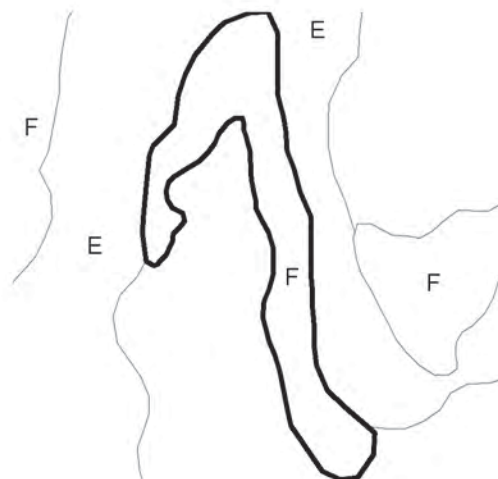
(a) Totara-kanuka forest on gentle coastal margin (100%)



Q08/111 Mooney QEII Covenant

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

0 250 500 1,000 Metres



Landform/geology

Peninsula underlain by undifferentiated Eocene-Oligocene mudstone, sandstone and bioclastic limestone (Motatau Complex).

Vegetation

Forest fringes the outer edges of a long, narrow peninsula at a sharp U-bend in the upper Pahi River. The inside of the river bend is thickly forested in mangroves, which buffer this site on all sides. Lower Pahi River Forest Remnants (Q08/103) is located opposite to the west, and the Upper Pahi River

Scenic Reserve, Rabbit and Goat Islands and Surrounds (Q08/109) lie directly to the east. The main canopy trees are totara and kanuka (the former more common), which are frequently overtopped by stands of kauri rickers, tanekaha, rimu and radiata pine. Kowhai is frequent around the water's edge. Occasional emergent macrocarpa are present.

Fauna

Kukupa (Gradual Decline).

Significance

This site is small and narrow, but forms an important buffer to the estuarine habitat in the Pahi River. Its significance is increased by the presence of a threatened bird species (kukupa), and by its proximity to other natural areas. This site includes part of a QEII Open Space Covenant (4.7 ha), the rest of which is excluded due to it being dominated by exotic grass and willow.

PUKEHUIA FOREST REMNANTS

Survey no.	Q08/115
Survey date	18 November 2005
Grid reference	Q08 269 602 (4 remnants)
Area	36.0 ha (34.7 ha forest, 1.3 ha wetland)
Altitude	40-140 m asl

Ecological units

- (a) Totara forest on moderate to steep hillslope (80%)
- (b) Unknown forest type (16%)
- (c) Open water (constructed freshwater farm pond) (2%)
- (d) Raupo reedland on constructed pond fringe (1%)
- (e) Soft rush rushland on constructed pond fringe (1%)

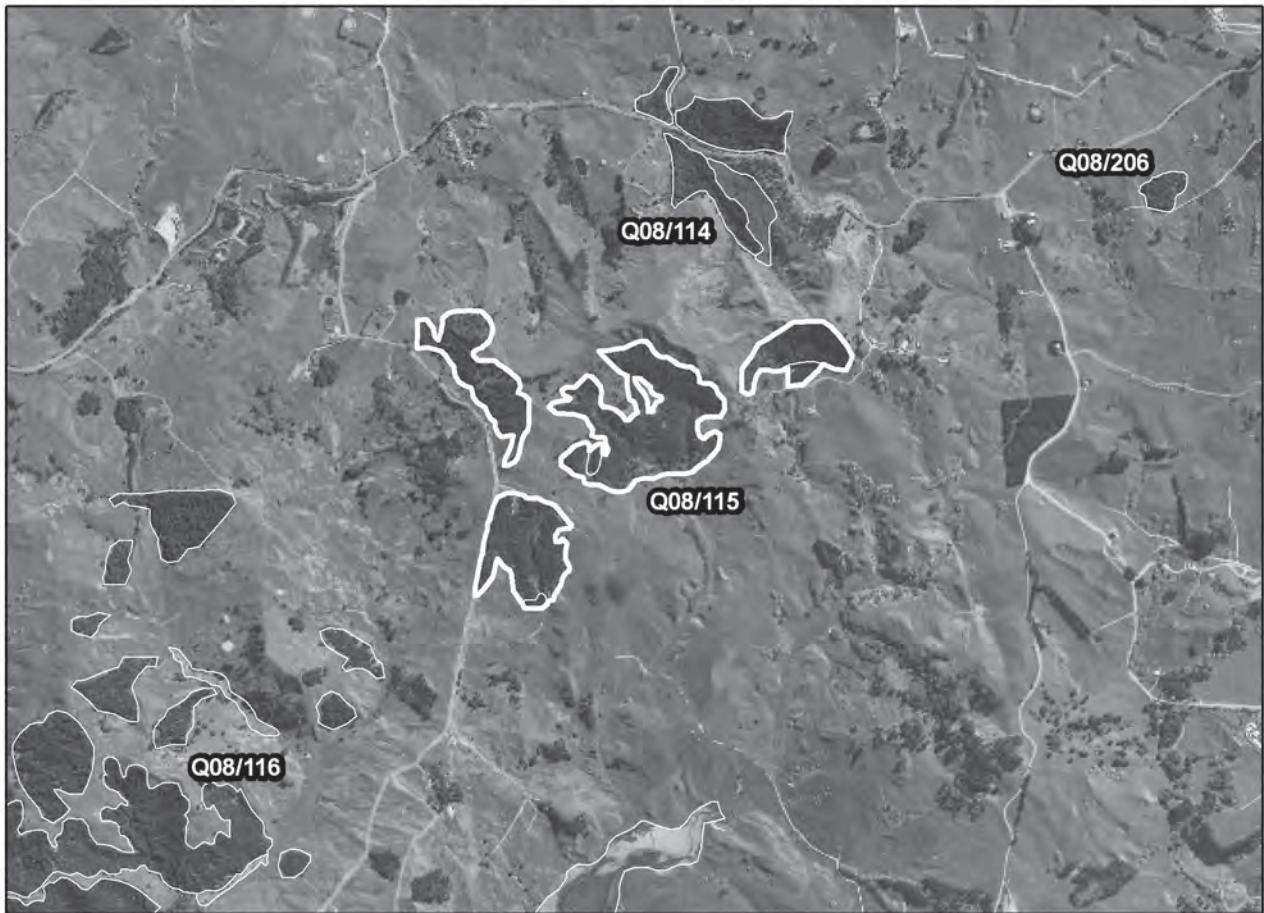
Landform/geology

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

Vegetation

This site encompasses four indigenous forest remnants associated with three constructed farm ponds, which are clustered around the southern slopes of Pukehuia peak.

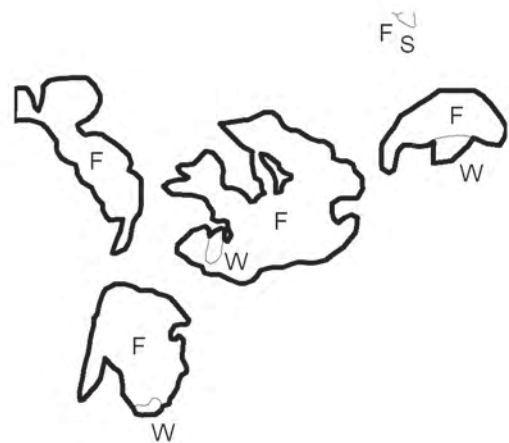
- (a) Most of the forest is dominated exclusively by totara. Kahikatea, kanuka and manuka occur frequently, with occasional taraire, karaka, kohekohe, puriri, rewarewa, tarata, mamaku, poplar, macrocarpa and pine. The exotic conifers mainly occur in groves and some are quite large.
- (b) The northeasternmost remnant obviously has a different vegetation type from (a), but was not able to be viewed from a public road, therefore its type remains indeterminate.
- (c) Three open water ponds, created by damming, are present.
- (d) One of the ponds has raupo as a major component of its fringing vegetation.



Q08/115 Pukehuia Forest Remnants

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

0 250 500 1,000 Metres



(e) Two of the ponds do not have indigenous fringing vegetation; it comprises mainly pasture and soft rush.

Fauna

Not surveyed.

Significance

This site has a significant extent of freshwater wetland for Otamatea ED Northland, being one of only fourteen sites with over 1 ha. It also has a relatively large forested extent for this part of the ED (over 30 ha). This is a representative site for (a) totara forest on moderate to steep hillslope.