

TABLE B: LIST OF LEVEL 1 SITES.

SITE NAME	SURVEY NO.	GRID REF.
Ruarangi Road Forest Remnants 1	Q07/112	Q07 249913
Takatearea Stream Forest	Q07/113	Q07 277865
Pokapu Hill Forest Remnants	Q07/114	Q07 274925
Mangapai Caves Road Forest and Shrubland	Q07/116	Q07 303895
North River Forest	Q07/117	Q07 331824
Waipu Caves Forest	Q07/118	Q07 318852
Ruakaka River Forest Remnants	Q07/119	Q07 359910
Caves Road Forest	Q07/120	Q07 350840
Ruakaka Forest	Q07/121	Q07 363874
Takahiwai Forest	Q07/124	Q07 379937
Tauroa Floodplain Forest Remnants	Q07/125	Q07 388901
Mountfield Road Wetlands	Q07/126	Q07 392848
Doctor's Hill Road Wetland	Q07/127	Q07 413859
Ruakaka Dunelands	Q07/128	Q07 430847
Ruakaka Racecourse Dune Lake	Q07/129	Q07 422891
Ruakaka River Estuary	Q07/130	Q07 420881
McEwan Road Wetland	Q07/131	Q07 429926
Waipu Caves Road Sandstone Knoll	Q07/132	Q07 308866
Ormiston Road Forest and Shrubland	Q07/135	Q07 355854
McDonnell Road Forest and Shrubland	Q07/137	Q07 291899
Upper Mangawai River Wetlands	Q07/138	Q07 263801
Eastern Mangawai Catchment Remnants	Q07/139	Q07 291812
Sime Road Wetland	Q07/141	Q07 424912
Takahiwai Stream Estuary	Q07/143	Q07 391950
Blacksmith's Creek Estuary	Q07/144	Q07 441948
Tauraroa River Forest Remnants	Q07/145	Q07 230923
Waiotira Stream Forest Remnants	Q07/148	Q07 259873
Russek Road Natural Area 1	Q07/149	Q07 232880
Russek Road Natural Area 2	Q07/150	Q07 238889
Paparoa Road Riparian Forest Remnants	Q07/152	Q07 246901
Ngatoka Forest and Shrubland	Q07/158	Q07 278883
Parry Road Forest Remnants	Q07/162	Q07 289911
Pohuenui River Forest Remnants	Q07/163	Q07 389830
Northland Port Corporation Ponds	Q07/164	Q07 443945
Mareretu Forest	Q08/220	Q08 326767
Brooks Road Forest and Shrubland	Q08/221	Q08 355733
Waipu Gorge Forest Remnants	Q08/222	Q08 361708
Glenmohr Road Wetland	Q08/223	Q08 411731
Ahuroa Road Forest Remnants	Q08/224	Q08 376786
Brynderwyn Hills Forest Complex	Part A	Q08/225a
	Part B	Q08/225b
	Part C	Q08/225c
	Part D	Q08/225d
	Part E	Q08/225e
	Part F	Q08/225f
	Part G	Q08/225g
	Part H	Q08/225h
	Part I	Q08/225i
	Part J	Q08/225j
Lang's Beach Coastal Forest and Shrubland	Q08/226	Q08 484723
Waipu River Estuary and Sand Spit	Q08/228	Q08 447762
Lang's Beach	Q08/230	Q08 491716
Waihoihoi River Forest Remnants	Q08/231	Q08 396773

SITE NAME	SURVEY NO.	GRID REF.
Waionehu Stream Forest Remnants	Q08/232	Q08 419768
SH1 Forest Remnants	Q08/233	Q08 390782
Ahuroa River Forest Remnants	Q08/235	Q08 379766
Dodd Road Forest Remnant	Q08/236	Q08 330702
Durham Road Forest and Shrubland	Q08/237	Q08 369723
Maxwell Creek Forest Remnant	Q08/238	Q08 346717
Helmsdale Road Forest and Shrubland	Q08/239	Q08 333801
Kaikowhiti Stream Forest Remnants	Q08/240	Q08 313737
Smales Road Forest Remnants	Q08/241	Q08 317720
Brooks Road Wetland	Q08/244	Q08 363750
Shoemaker Road Forest Remnant 2	Q08/247	Q08 402780
Bream Tail	R08/001	Q08 530706
Cove Road Shrubland and Forest	R08/002	Q08 504708

RUARANGI ROAD FOREST REMNANTS 1

Survey no.	Q07/112
Survey date	10 November 2006
Grid reference	Q07 249913 (15 remnants)
Area	58.8 ha (56.8 ha forest, 1.9 ha shrubland)
Altitude	75–160 m asl

Ecological units

- (a) Totara forest on moderate hillslope (25%)
- (b) Taraire forest on moderate hillslope or in gully heads (21%)
- (c) Totara-kahikatea forest on moderate hillslope (16%)
- (d) Taraire-kahikatea forest on moderate hillslope (15%)
- (e) Totara-kahikatea-taraire forest on moderate hillslope (10%)
- (f) Mahoe-totara-kohuhu shrubland on gentle hillslope (5%)
- (g) Kahikatea forest in gully (4%)
- (h) Kahikatea-pukatea forest on gentle hillslope (4%)

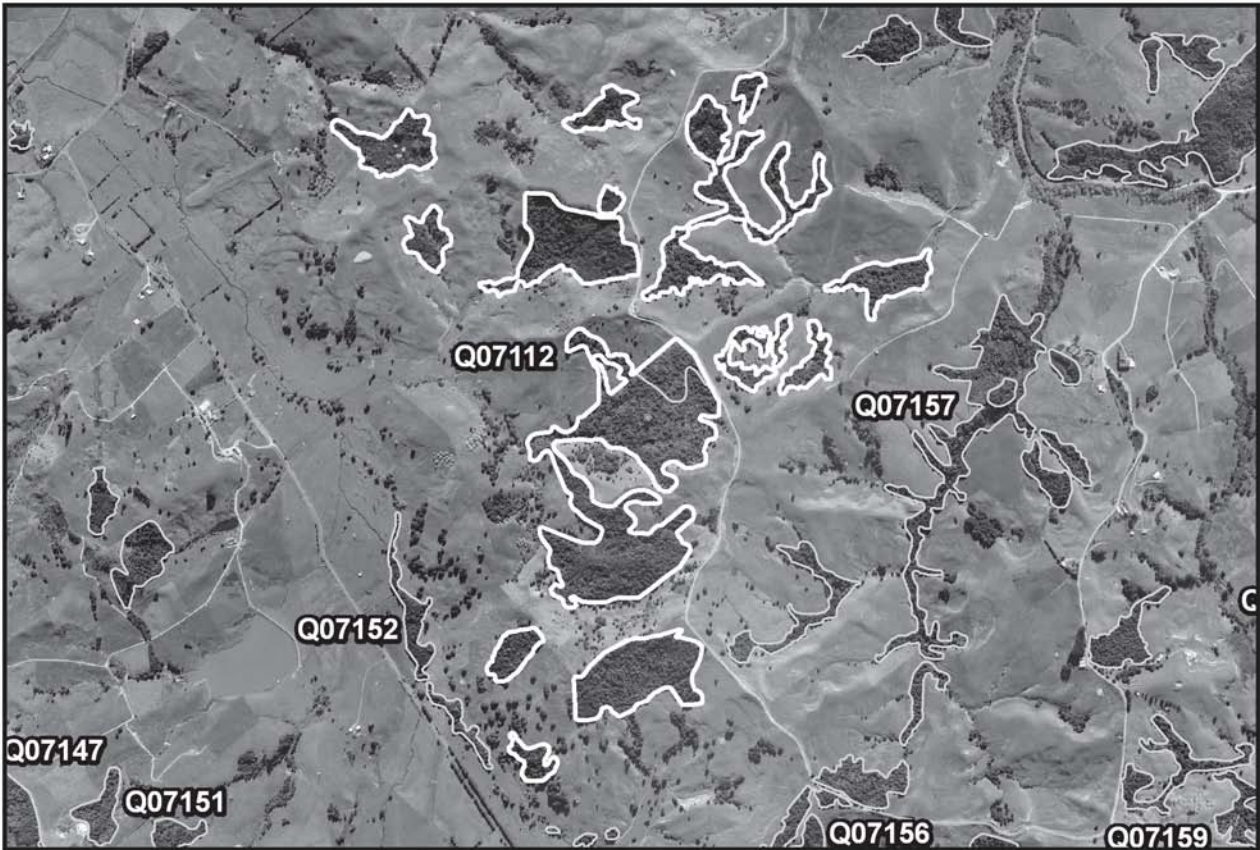
Landform/geology

Hillslopes and gullies underlain by Miocene sandy mudstone (Waitemata Group).

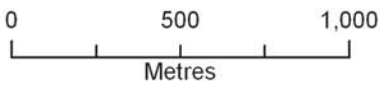
Vegetation

This site comprises 15 forest remnants in the Ruarangi Road area. The road extends along a ridge orientated north-south, and the remnants are on either side of the road on east- or west-facing hillslopes and gullies. They contain a diverse range of vegetation types according to disturbance history and topography. Totara-kahikatea-taraire forest (e) in one of the remnants had mature, emergent kahikatea suggesting that at least some of the forest remnants are not secondary. Most of the remnants are grazed with minimal understorey but part of the largest remnant and the southernmost remnant is fenced with an established understorey.







Totara forest (a), totara-kahikatea forest (c) and totara-kahikatea-taraire forest (e) are common forest types on moderate hillslopes. In the totara-dominated remnants at this site there is occasional kanuka, kauri, kahikatea, taraire, puriri, nikau, tawa, rimu,



Q07/112 Ruarangi Road Forest Remnants 1



Habitat Type

-  Forest
-  Shrubland
-  Wetland
-  Duneland/Sandfield
-  Estuarine
-  Rockland



pukatea, tanekaha, kohuhu, mamaku, and ti kouka. Taraire forest on moderate hillslopes or in gully heads (b), or taraire–kahikatea forest (d) on moderate hillslopes are the second most extensive forest types in the remnants and is often associated with frequent kanuka, totara, and kahikatea, and a diverse range of other species

including occasional nikau, pukatea, tawa, mamaku, rimu, rewarewa, mahoe, pigeonwood, kauri and puriri.

On the upper slopes of the largest remnant is an area of indigenous shrubland. Mahoe, totara and kohuhu are common (f), with occasional kahikatea, putaputaweta, ponga, pate, mapou, ti kouka, kanuka, manuka, gorse, and Yorkshire fog.

Kahikatea is often dominant in the gullies (g) and kahikatea-pukatea forest (h) occurs on the gentler hillslopes. Species occurring occasionally in kahikatea-dominated mixtures include puriri, taraire, kauri, rimu, and ponga.

Fauna

Kukupu (Gradual Decline), NZ kingfisher, Australasian harrier, shining cuckoo and welcome swallow were recorded in this survey. *Amborhytida dunniae* (Gradual Decline) has also been recorded (Fred Brook pers. comm. 2007).

Significance

This site contains five representative ecological units: (b) taraire forest on moderate hillslope or in gully head, which includes mature, emergent kahikatea, (d) taraire-kahikatea forest on moderate hillslope, (g) kahikatea forest in gully, (h) kahikatea-pukatea forest on gentle hillslope, and (f) mahoe-totara-kohuhu shrubland on gentle hillslope, which is the only example of this ecological unit in Waipu ED. The canopy of the remnants is generally diverse and healthy, and there is minimal weed infestation. Most of the remnants are grazed with a sparse understorey. Areas that are fenced to exclude cattle have an established and diverse understorey. The site supports a threatened bird species (kukupu) and a threatened land snail (*Amborhytida dunniae*).

TAKATEAREA STREAM FOREST

Survey no.	Q07/113
Survey date	12 November 2006
Grid reference	Q07 277865 (17 remnants)
Area	105.5 ha
Altitude	80-240 m asl

Ecological units

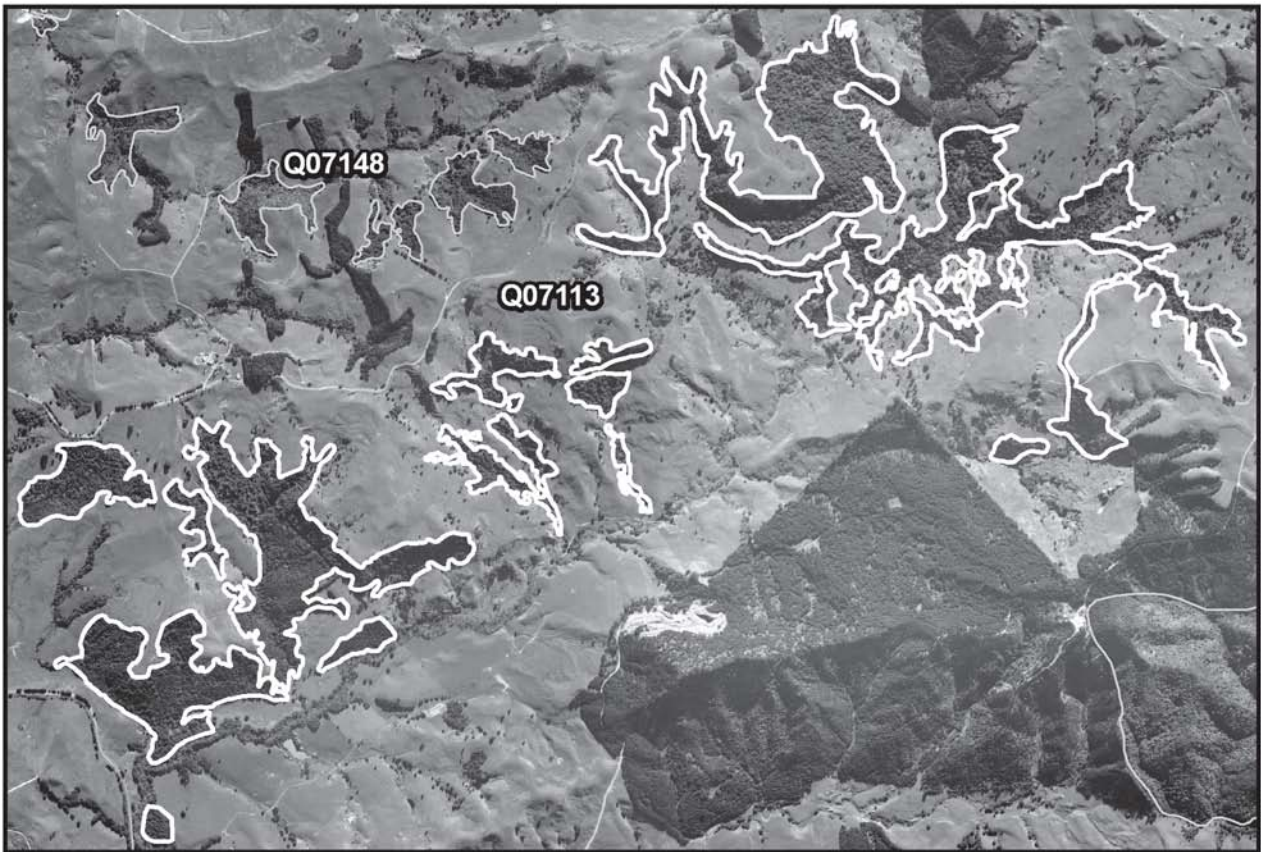
- (a) Totara forest on moderate to steep hillslope and cliff (60%)
- (b) Totara treeland on moderate to steep hillslope and cliff (20%)
- (c) Kanuka-totara-mamaku forest on steep hillslope (10%)
- (d) Kahikatea-nikau forest on alluvium (5%)
- (e) Kahikatea forest in gully (5%)

Landform/geology

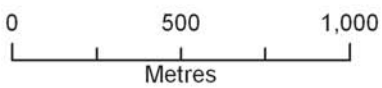
Hillslopes and gullies predominantly underlain by Miocene sandy mudstone and bluff-forming sandstone (Waitemata Group), with a small area of Mesozoic greywacke (Waipapa Terrane) in the vicinity of Q07/263856, and areas of Holocene valley-floor alluvium along Takatearea Stream.

Vegetation







This site comprises scattered remnants of indigenous forest and treeland in the upper Takatearea Stream catchment, to the east of Paparoa Road. The remnants have been heavily impacted by stock (i.e. lack of understorey and edge vegetation,



Q07/113 Takatearea Stream Forest



Habitat Type

-  Forest
-  Shrubland
-  Wetland
-  Duneland/Sandfield
-  Estuarine
-  Rockland



fragmentation) because they are generally unfenced from surrounding pastoral land, however there are many sandstone cliffs and steep hillslopes which deter stock and provide refuges for palatable vegetation. Riparian forest dominated by crack willow which occurs along the main stream gully, and contains only a low density of indigenous species, has been excluded from the site.

Totara is the most common tree species throughout the site. In places it forms forest in association with frequent kahikatea and occasional kauri, ti kouka, rewarewa, taraire, rimu, towai, nikau, puriri and radiata pine (a). In areas with heavier stock impacts totara treeland occurs (b). Scattered mapou, Chinese privet, arum lily and exotic grasses occur outside of the site on occasional bare mudstone cliff faces between totara forest and treeland remnants. There are several steep faces with kanuka-totara-mamaku forest (c) in the western part of the site. At the foot of the largest cliff within the site there is a small area of kahikatea-nikau forest on alluvium (d) with frequent totara and occasional pukatea and rewarewa. Some large old kahikatea are present here. At least one gully in the upper catchment has dense young kahikatea forest (e) with frequent totara and kanuka, and occasional pukatea and taraire. Not all parts of the site were easily visible, therefore some ecological units may have been overlooked.

Fauna

Australasian harrier.

Significance

This site has two representative ecological units: (d) kahikatea-nikau forest on alluvium (not recorded elsewhere in the ED) and (e) kahikatea forest in gully. Apart from these small units the site is not particularly diverse; totara is dominant across the area as a result of grazing impacts. The steep sandstone cliffs are a distinctive feature of the local area. Forest and treeland on steep areas provides some protection to the Takatearea Stream catchment.

POKAPU HILL FOREST REMNANTS

Survey no.	Q07/114
Survey date	13 November 2006
Grid reference	Q07 274925 (6 remnants)
Area	82.8 ha
Altitude	40-55 m asl

Ecological units

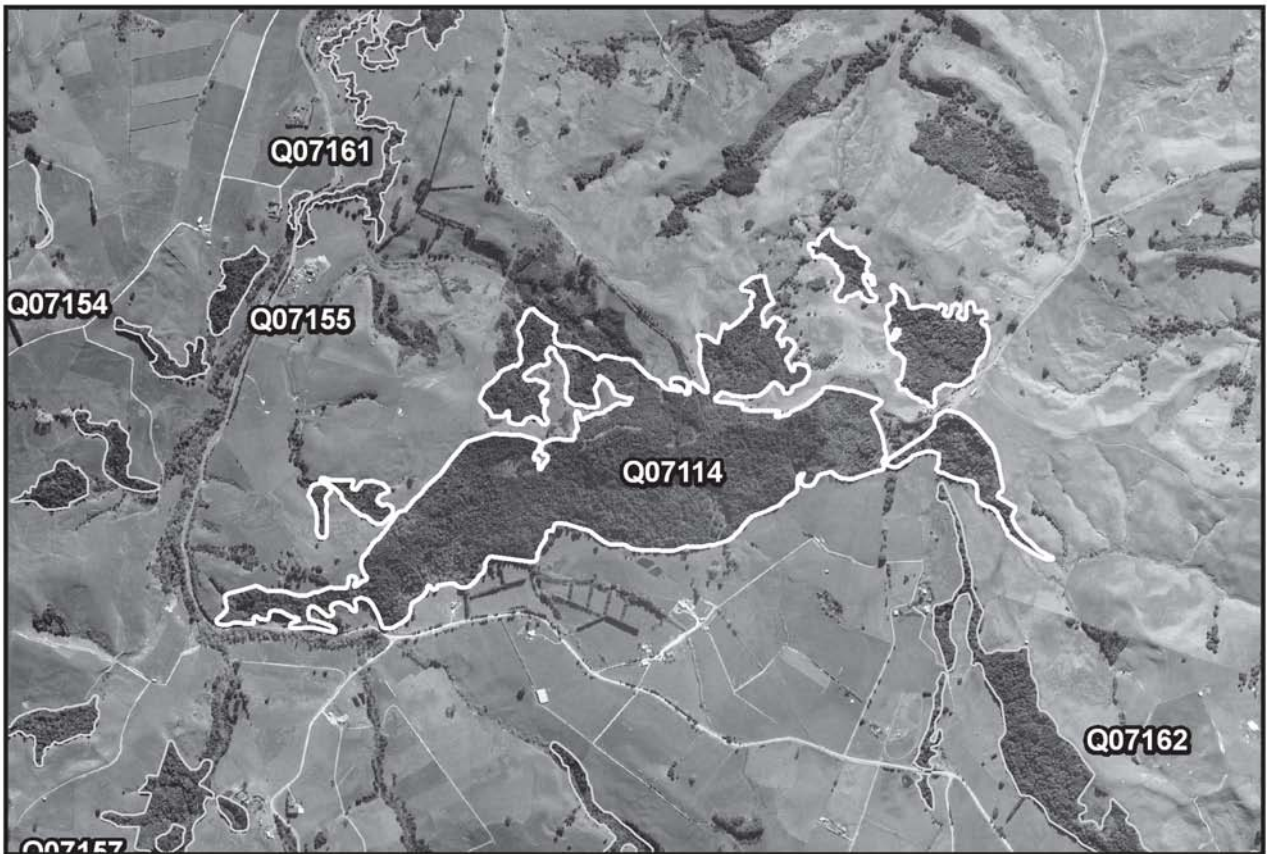
- (a) Taraire forest on moderate hillslope (35%)
- (b) Totara-kahikatea-kanuka forest on moderate hillslope (25%)
- (c) Kanuka-kahikatea forest in gully (20%)
- (d) Kanuka-totara forest on ridge (15%)
- (e) Mamaku-mahoe forest on steep hillslope (5%)

Landform/geology

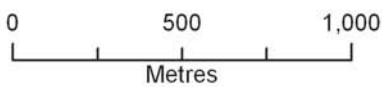
Hillslopes and gullies predominantly underlain by Miocene sandy mudstone (Waitemata Group), with a small area of Mesozoic greywacke (Waipapa Terrane) in the vicinity of Q07 262920, and Holocene valley-floor alluvium along the southern margin of the site.

Vegetation







This site comprises one large and five small forest remnants in the vicinity of the 162 m highpoint to the north of Mangapai Caves Road. The western end of the largest remnant is grazed by cattle and has a severely depleted understorey. The central area of the main remnant, on a moderately sloping, south-facing hillslope, has been fenced

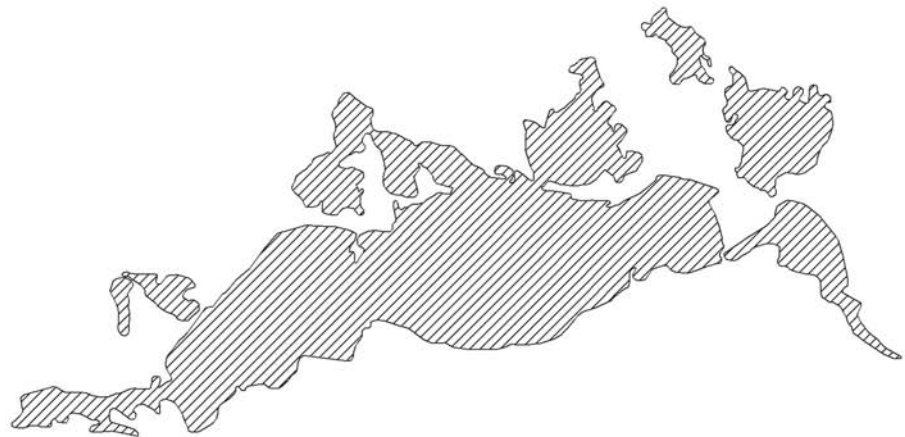


Q07/114 Pokapu Hill Forest Remnants



Habitat Type

-  Forest
-  Shrubland
-  Wetland
-  Duneland/Sandfield
-  Estuarine
-  Rockland



to exclude stock and has an established understorey; this area is approximately 20 ha in area, 16 ha of which is subject to a sustainable harvest permit (Grant McClellan pers. comm.). The larger remnant in the northeast is fenced, and the remaining remnants are probably all grazed (Grant McClellan pers. comm.).

(a) The central, south-facing slope of the largest remnant is taraire forest with frequent puriri and kahikatea, and occasional pukatea, nikau, rimu, towai, mamaku, totara, rewarewa, puka, and kahakaha.

(b) The northern remnants and the edges of the main remnant are totara forest. Kahikatea and kanuka are common with occasional ponga, pukatea, mahoe, mamaku, mapou, kohekohe, kauri, towai, and puriri.

(c) Kanuka- and kahikatea-dominant forest occurs in the gully along the southern edge of the largest remnant, with frequent pukatea and totara, and occasional kowhai, ponga, puriri, ti kouka, kohuhu, and pate.

(d) Kanuka forest occurs on the main ridge of the largest remnant. Totara is common, with frequent rimu and occasional rewarewa, kahikatea, and ti kouka. There are a few mida in the understorey.

(e) The westernmost area of the remnant, on a steep hillslope, is dominated by mamaku and mahoe, with frequent totara and occasional ponga and pate.

Significant flora

Mida (Gradual Decline) is occasional in the kanuka-dominated forest along the main ridge.

Fauna

Kukupa (Gradual Decline), kauri snail (Gradual Decline), tui, North Island fantail, grey warbler and shining cuckoo are present in the central part of the largest forest remnant and in some of the smaller northern remnants (Grant and Lea McClellan pers. comm.). Australasian harrier, pukeko, morepork and silvereye were recorded in 1978 (SSBI Q07/R07/H 052).

Significance

This site is representative of three ecological units: (c) kanuka-kahikatea forest in gully, (b) totara-kahikatea-kanuka forest on moderate hillslope, and (e) mamaku-mahoe forest on steep hillslope. The remnants have a diverse, healthy canopy and an established understorey where stock are excluded. Weeds are largely confined to the forest margins. The remnant provides riparian protection for a tributary of the Tauraroa River. The site supports two threatened fauna species (kukupa and kauri snail) and one threatened plant species (mida).

MANGAPAI CAVES ROAD FOREST AND SHRUBLAND

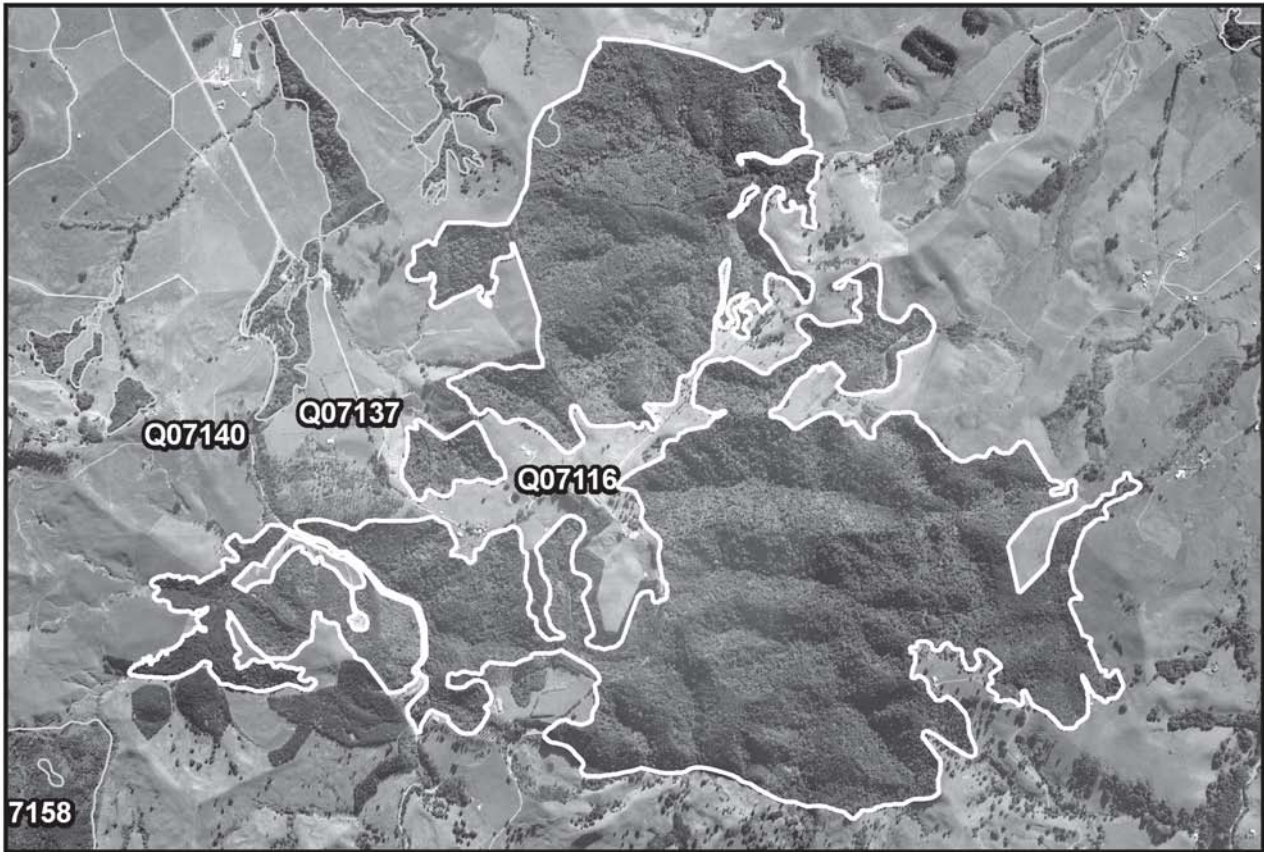
Survey no.	Q07/116
Survey date	13 November 2006
Grid reference	Q07 303895 (4 remnants)
Area	271.3 ha (270.8 ha forest, 0.6 ha shrubland)
Altitude	60-180 m asl

Ecological units

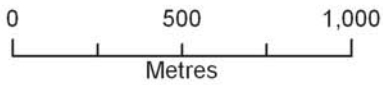
- (a) Kauri forest on moderate hillslopes and ridges (40%)
- (b) Kanuka forest on moderate to steep hillslope (20%)
- (c) Kanuka-totara forest on moderate hillslope (8%)
- (d) Kanuka-towai forest on moderate hillslope and in gully (8%)
- (e) Manuka shrubland on ridge (2%)
- (f) Towai forest on moderate hillslope and in gully (2%)

Landform/geology







Gullies underlain by Miocene sandy mudstone (Waitemata Group).

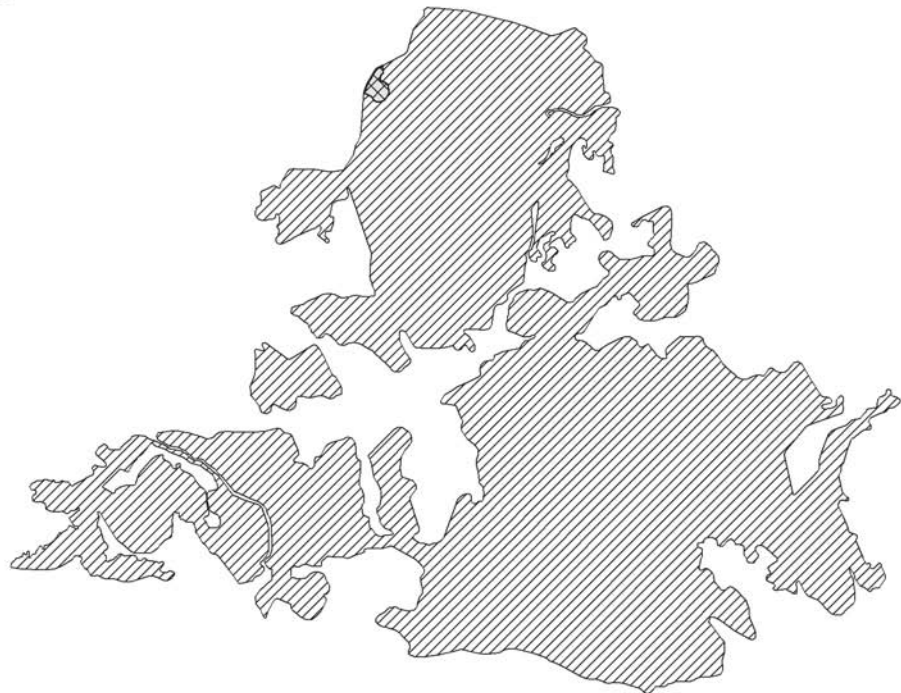


Q07/116 Mangapai Caves Road Forest and Shrubland



Habitat Type

-  Forest
-  Shrubland
-  Wetland
-  Duneland/Sandfield
-  Estuarine
-  Rockland



Vegetation

This site comprises forest remnants in the headwaters of the Waikokopa Stream. The smaller northern remnant is primarily secondary kanuka-totara forest (c) with frequent kahikatea, kauri and tanekaha and occasional puriri, puka, ponga, taraire, rewarewa, rimu, nikau, and mamaku. On the northwestern edge of the remnant on a

ridge is a small area of manuka shrubland (e) with frequent ponga and gorse, and occasional totara, mamaku, and kanuka. Some areas on moderate hillslopes and in gullies comprise towai forest (f) with frequent rewarewa and kanuka, and occasional taraire and tawa.

The larger, southern remnant is also secondary. Kauri forest (a) with occasional kanuka and tanekaha is the most commonly occurring vegetation type on the central hillslopes and ridges, with younger kanuka (b) or kanuka-totara (c) forest on the southern and eastern edges. The western area of the remnant, on either side of Mangapai Caves Road, is also dominated by kanuka. Kanuka forest (b) covers the steep hillslope on the southern side of the road with frequent mamaku and occasional kohuhu, ti kouka, ponga, lancewood, ti ngahere, and mahoe. The vegetation on the moderate hillslope on the northern side of the road, some of which is fenced to exclude stock, is kanuka-towai forest (d) with frequent rewarewa, and occasional pukatea, pigeonwood, pate, mamaku, tawa, taraire, nikau, karaka, and kahikatea.

Significant flora

Mida (Gradual Decline) recorded in 1991 (SSBI Q07/R07/H 054).

Fauna

NZ kingfisher and shining cuckoo were recorded in this survey. Kukupa (Gradual Decline), kauri snail (Gradual Decline), Australasian harrier, grey warbler, North Island fantail, silvereye, and tui were recorded in 1991 (SSBI Q07/R07/H 054).

Significance

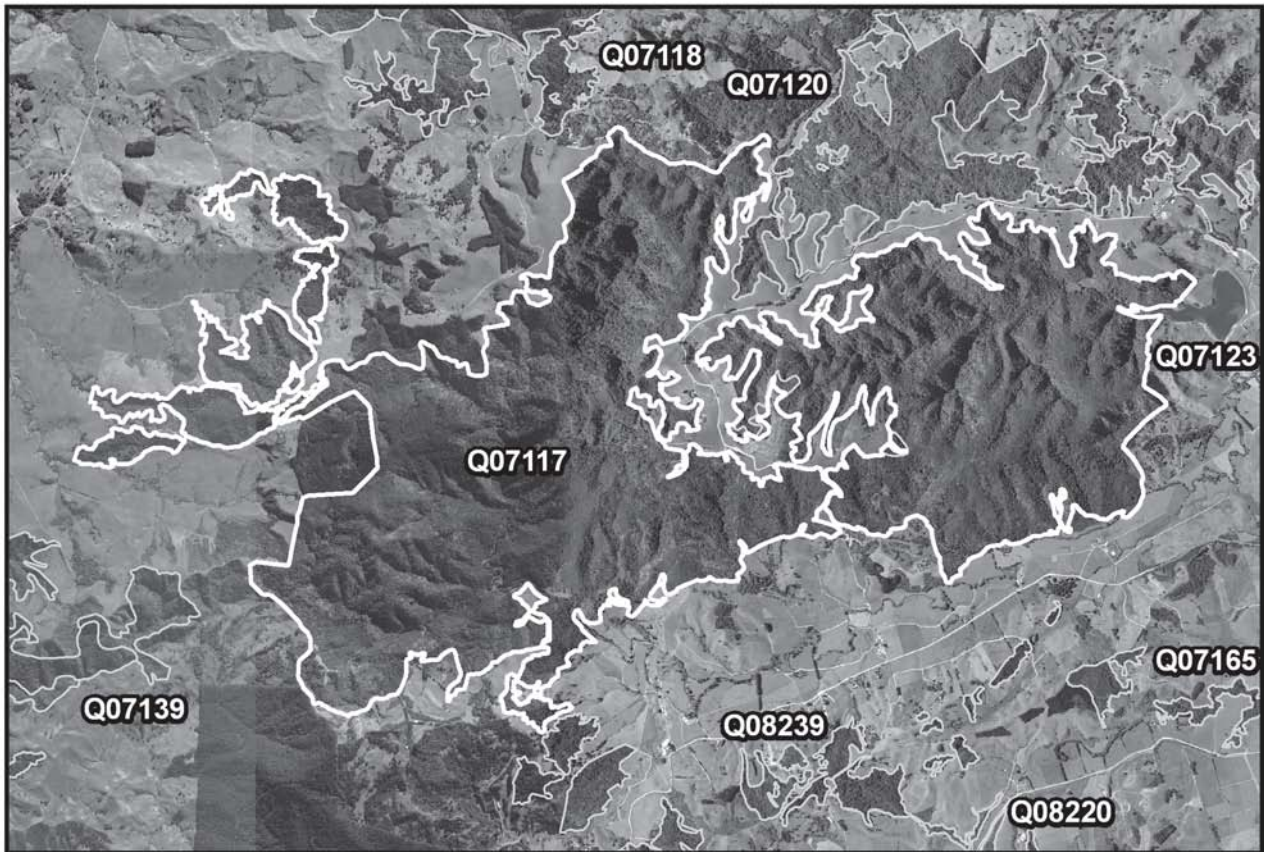
This site contains two representative units: (c) kanuka-totara forest on moderate hillslope, and (d) kanuka-towai forest on moderate hillslope and in gully. The remnants have an established understorey where stock are excluded, and weeds are largely confined to forest edges. The vegetation provides riparian protection for the headwaters of the Waikokopa Stream and a tributary of the Tauraroa River. Twenty-three ha of this site are in a DOC-administered scenic reserve.

NORTH RIVER FOREST

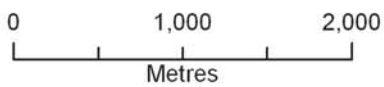
Survey no.	Q07/117
Survey date	12 November 2006
Grid reference	Q07 331824 (9 remnants)
Area	973.4 ha (968.9 ha forest, 4.5 ha shrubland)
Altitude	40-240 m asl

Ecological units







- (a) Kanuka-rimu-tanekaha-kauri forest on ridge (30%)
- (b) Kanuka-mamaku forest on ridge, hillslope and in gully head (20%)
- (c) Taraire forest on moderate to steep hillslope and gully (15%)
- (d) Tanekaha-kanuka forest on ridge and steep hillslope (10%)
- (e) Kanuka forest on ridge (10%)
- (f) Puriri forest in gully (5%)
- (g) Kauri-kanuka forest on ridge (3%)
- (h) Kanuka-rewarewa forest in gully head (2%)
- (i) Totara forest on moderate hillslope (1%)



Q07/117 North River Forest



Habitat Type

-  Forest
-  Shrubland
-  Wetland
-  Duneland/Sandfield
-  Estuarine
-  Rockland



- (j) Totara-taraire forest in gully (1%)
- (k) Rimu-tanekaha forest on ridge (1%)
- (l) Kowhai-kahikatea forest on alluvium (1%)
- (m) Kanuka shrubland on ridge (1%)

Landform/geology

Steep hill country with deeply incised valleys and gullies; predominantly underlain by Mesozoic greywacke (Waipapa Terrane), but with areas of Oligocene limestone karst

(Whangarei Limestone, Te Kuiti Group) along Waipu Caves Road, and Miocene sandy mudstone (Waitemata Group) in the vicinity of Q07 311811. Small areas of Holocene alluvial flats are present in the North River gorge from Q07 328832–326829, and on the southern side of a prominent fault scarp at Q07 358819.

Vegetation

North River Forest is a large, semi-continuous area of indigenous forest and shrubland on east-west-trending steep hill country south of Waipu Caves Road and north of Helmsdale Road. North River lies to the south of these hills, draining eastwards into the Pohuenui River, the Waipu River and ultimately into Bream Bay. Two sub-catchments of the North River lie within this site. One draining eastwards off the northern side of the hills, and one draining south through a steep, winding, limestone gorge that descends from Waipu Caves Road. This gorge has 'impressive water falls' (SSBI Q07/H059). The alluvial plains associated with the North River are mainly in pasture and exotic vegetation, except for a small area of kowhai–kahikatea forest on alluvium (l), which is at the southeastern edge of the site. Piecemeal vegetation clearance has occurred all around the edges of the site, as well as in the central area off Palmer Road around the 239 m asl peak. Within the Palmer Road clearing there are residential houses, small radiata pine plantations, and paddocks, next to which small areas of kanuka shrubland (m) are regenerating. Directly to the east of the Palmer Road clearing lies the North River Scenic Reserve, which contains some of the most densely forested north-facing landforms of the site. The Waipu Scenic Reserve and McLean Queen Elizabeth II Open Space Covenant are located in the deep gorge to the west, which appears to support mature taraire forest with emergent podocarps, however this area was not visible during the survey.

The most widespread forest type within the site is secondary kanuka–rimu–tanekaha–kauri forest (a) on broad ridges, especially those facing northwards. At the lower end of north-facing ridges and on side slopes there is often pure tanekaha over kanuka (d). Small, localised stands of rimu–tanekaha forest (k) occur throughout. These types are probably no older than 100 years, judging by the uniform size and morphology of rimu, tanekaha and kauri poles. Certain prominent ridgelines support kauri–kanuka forest (g) which is probably of a similar age, however on this landform kauri trees have broadened their crowns due to open growing conditions. Extensive areas of younger (i.e. < 50 year old) kanuka–mamaku forest (b) and kanuka forest (e) occur on ridges and hillslopes throughout, although these types appear to be more common on the more frequently disturbed southwestern hills, and also on southern aspects.

The most common forest type in gullies and on steep, shaded hillslopes is taraire forest (c) which was noted as being particularly dominant in very steep south-facing gullies and hillslopes directly above the North River. The canopy comprises abundant taraire, associated with frequent kahikatea and occasional puriri, towai, kohekohe, rimu, kauri, kanuka, rewarewa, totara, karaka, nikau, tree fuchsia and puka. The understorey of this type was briefly investigated in the head of one gully. Vegetation was typical of a southern-aspect, shaded broadleaf forest understorey, with kiekie, supplejack, pate and numerous ferns, e.g. gully fern, ponga, heruheru, *Blechnum chambersii*, thread fern, hanging spleenwort, *Lastreopsis hispidata*, and fragrant fern.

A 1992 ecological survey of this site (SSBI Q07/H059) describes taraire forest in gullies to the southwest of Waipu Scenic Reserve (which was not visible during the current survey) as having kauri, rimu and rewarewa emergent over a canopy of taraire and karaka, with puriri, miro, totara and tawa occurring less frequently. In the

surveyed section the subcanopy comprises kohekohe and nikau with mida and tarata uncommon; the shrub tier consists of taurepo, ponga, kawakawa, rangiora, hangehange and kiekie; ground cover is *Blechnum chambersii* and thread fern. In some areas the understorey was sparse due to grazing

Puriri forest in gullies (f) was less visible, but appeared to be more common in steep north-draining gullies. Puriri forest was associated with frequent kohekohe, nikau and mamaku. Some disturbed gully heads on the north side of the crest appear to be dominated by kanuka and rewarewa (h). Totara-taraire forest (j) with frequent rewarewa and occasional nikau occurs in a few locations within the lower parts of gullies, adjacent to pasture. Forest edges bordering Waipu Caves Road in the north are generally dominated by totara, with scattered puriri, kahikatea and karaka (i).

Significant flora

Doodia squarrosa (Gradual Decline), mida (Gradual Decline), *Doodia mollis* (Sparse), *Nematoceras rivulare* (Data Deficient), *Hebe macrocarpa* var. *macrocarpa* (regionally significant) (AK 220574), tree fuchsia (regionally significant), *Oxalis magellanica* (regionally significant), *Brachyglottis kirkii* var. *angustior* (regionally significant), and gully tree fern (regionally significant) were recorded in 1992 (SSBI Q07/H059).

Fauna

Kauri snail (Gradual Decline), kukupa (Gradual Decline), Hochstetter's frog (Sparse), NZ kingfisher, welcome swallow, grey warbler, fantail, silvereye, tui, and Australasian harrier were recorded in 1992 (SSBI Q07/H059). The land snail *Amborhytida dunniiae* (Gradual Decline) (a landsnail) is known from this site (Fred Brook pers. comm.). Two copper skinks were noted in the deeply dissected upper North River valley in 1992 (DOC Bioweb 2007). In 1994 Hochstetter's frogs were also recorded at several locations in the North River catchment, in low numbers (e.g. 1-6 individuals per site) (DOC Bioweb 2007).

Unconfirmed reports of North Island brown kiwi (Serious Decline) and tomtit (regionally significant) were noted in 1992 (SSBI Q07/H059). It is unlikely that kiwi remain at this site, as they are largely absent from southern Northland (Miller & Pierce 1995).

Longfin eel (Gradual Decline), banded kokopu (regionally significant), shortfin eel, inanga, redfin bully, Cran's bully, torrentfish, and koura have been recorded at various points along the North River within this site between 1995 and 2001 (NIWA 2007).

Significance

North River Forest is one of the largest areas of indigenous forest areas in Waipu ED, and occupies an important position between Ruakaka Forest (Q07/121) and Mareretu Forest (Q08/220) in the centre of the inland hill country of the ED. This site provides habitat for four threatened plant species (*Doodia squarrosa*, *D. mollis*, mida, and *Nematoceras rivulare*), five regionally significant plant species (*Hebe macrocarpa* var. *macrocarpa*, tree fuchsia, *Oxalis magellanica*, *Brachyglottis kirkii* var. *angustior*, and gully tree fern), five threatened fauna species (kauri snail, kukupa, Hochstetter's frog, *Amborhytida dunniiae*, and longfin eel), and two regionally significant fauna species (tomtit and banded kokopu). It has nine representative ecological units: (a) kanuka-rimu-tanekaha-kauri forest on ridge, (b) kanuka-mamaku forest on ridge, hillslope and in gully head, (c) taraire forest on moderate to steep hillslope and gully, (d) tanekaha-kanuka forest on ridge and steep hillslope, (e) kanuka forest on ridge, (f) puriri forest in gully, (g) kauri-kanuka forest

on ridge, (h) kanuka–rewarewa forest in gully head, (k) rimu–tanekaha forest on ridge and (l) kowhai–kahikatea forest on alluvium (this unit is unique in the ED, and rare nationally). This site is very similar to Ruakaka Forest and Mareretu Forest but is more disturbed and has younger vegetation overall. However, it does include an area of limestone and associated caves which these other sites do not have. Limestone geology and the vegetation it supports is regionally distinctive. Pressures on this site include feral goats, felling of shrubland areas, and moderate recreational use (particularly caving, trail bikes, orienteering, and horse riding) (SSBI Q07/H059). Approximately 21% of the site is protected. (167 ha of the site is within North River Scenic Reserve and Waipu Scenic Reserve (DOC-administered), and there is a 32.5 ha Queen Elizabeth II Open Space Covenant).

WAIPU CAVES FOREST

Survey no.	Q07/118
Survey date	10 November 2006
Grid reference	Q07 318852 (5 remnants)
Area	370.8 ha
Altitude	84–260 m asl

Ecological units

- (a) Totara forest on moderate hillslope (60%)
- (b) Totara–taraire forest on moderate hillslope and in gully (18%)
- (c) Kanuka forest on moderate hillslope and ridge (10%)
- (d) Totara–mamaku forest on moderate hillslope (5%)
- (e) Totara treeland on gentle hillslope (3%)
- (f) Totara–hawthorn forest on gentle hillslope (2%)
- (g) Kauri–kanuka forest on ridge (2%)

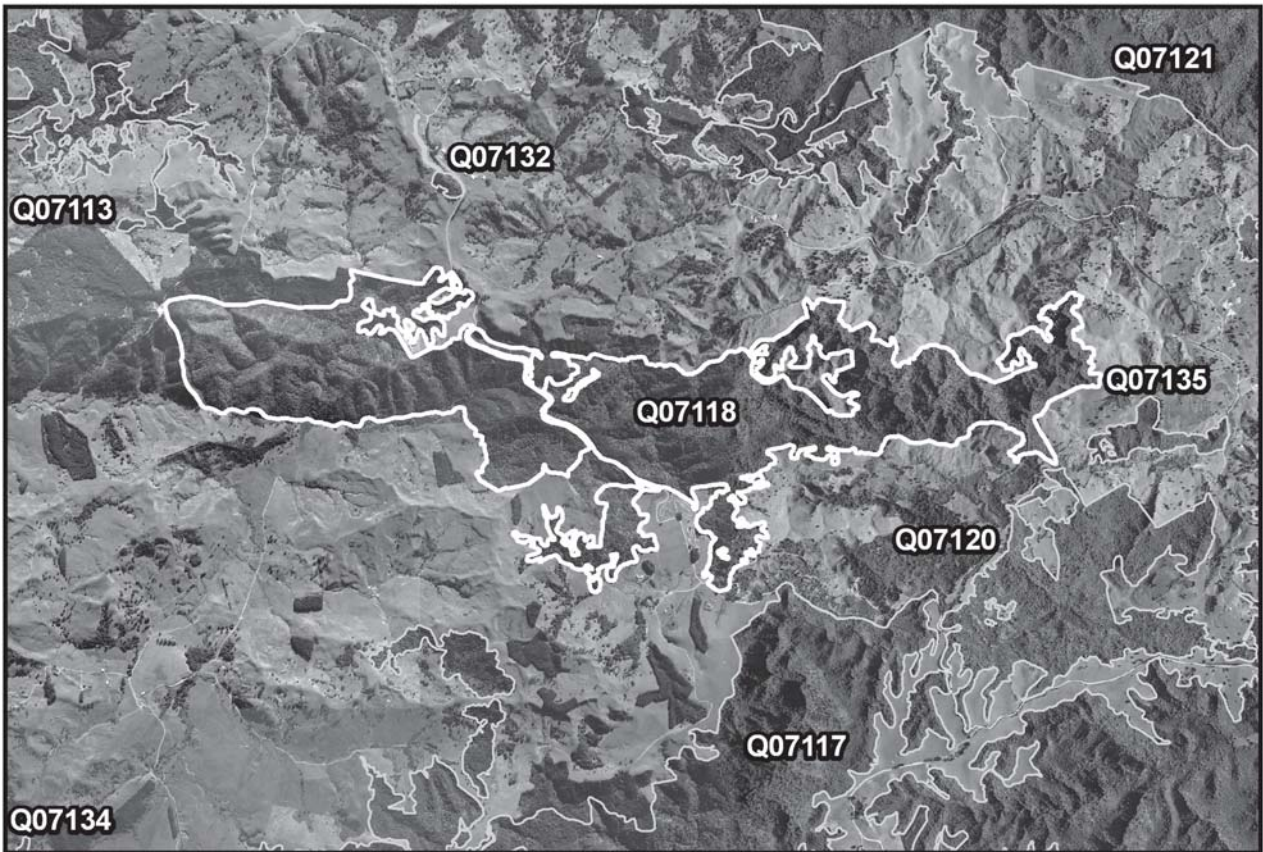
Landform/geology

Steep hill country with deeply incised valleys and gullies; predominantly underlain by Mesozoic greywacke (Waipapa Terrane), but with Oligocene limestone karst (Whangarei Limestone, Te Kuiti Group) at Waipu Caves, and small areas of Miocene sandy mudstone (Waitemata Group).

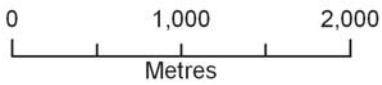
Vegetation

Waipu Caves Forest is a long, narrow tract of indigenous forest—the site extends over approximately 5 km in an east–west direction and 600 m wide in a north–south direction—which covers steep hill country in the western part of the ED. The site is dissected by Waipu Caves Road and is surrounded by agricultural and silvicultural land. A large radiata pine plantation abuts the site to the west. The forest edge is convoluted and irregular in the south, where it extends out towards the Waipu Caves reserve entrance. Apart from the Waipu Caves Road Scenic Reserve at centre, few areas appear to be fenced off from stock. Consequently, on the site margins, there are several areas of grazed totara treeland (e).







The main forest type is totara forest (a) with frequent kanuka and occasional tawa, puriri and karaka. In gullies and on shaded (i.e. predominantly south-facing) hillslopes totara forest grades into a more diverse mixture of totara–taraire forest (b)

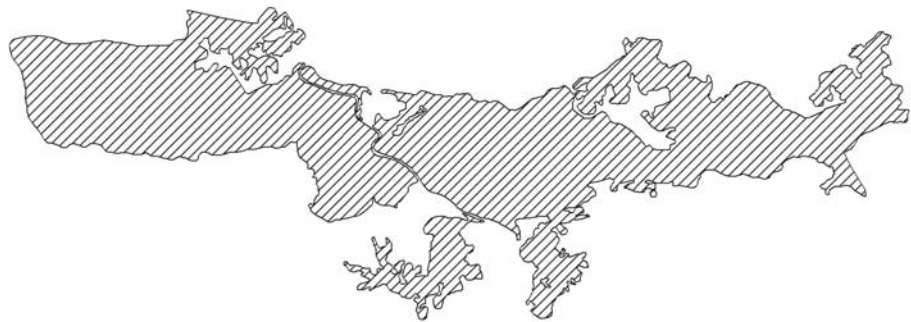


Q07/118 Waipū Caves Forest



Habitat Type

-  Forest
-  Shrubland
-  Wetland
-  Duneland/Sandfield
-  Estuarine
-  Rockland



with occasional emergent northern rata and large ancient totara (perhaps the largest in the ecological district). There is a wide range of locally occurring species in the canopy, including kahikatea, rimu, kauri, tawa, rewarewa, ti ngahere, ti kouka, nikau, kohekohe, puriri, puka, and kiekie. Secondary kanuka forest (c) with occasional tanekaha, rimu, totara, mamaku, ponga, mapou, hangehange, mingimingi and

manuka is present on several broad ridges and moderate hillslopes within the site, usually near the forest edge, which indicates retiring of land or disturbance in these areas around 30–50 years ago. Similarly there are small areas of young totara–mamaku forest (d) on recently disturbed hillslopes with frequent kanuka and occasional lancewood, ti kouka, rimu and kahikatea. One of the most distinctive forest types within the site is totara–hawthorn forest (f) which occurs on areas of low limestone outcrops. Although heavily grazed and trampled, there are several rare, and plants not commonly seen in the ED in unit (f), often perched on the limestone, e.g. *Peperomia urvilleana*, *Parietaria debilis*, *Doodia mollis*, carmine rata and tree fuchsia.

Significant flora

Doodia mollis (Sparse) (AK 298335), carmine rata (regionally significant) (AK 297995), and tree fuchsia (regionally significant).

Fauna

Kukupa (Gradual Decline) are present (current study). 1978 records include kauri snail (Gradual Decline), kukupa, Hochstetter's frog (Sparse), white-faced heron, paradise shelduck, Australasian harrier, pukeko, NZ kingfisher, grey warbler, fantail, silveryeye, and the land snail *Liarea turriculata turriculata** (SSBI Q07/H057). The land snail species *Amborhytida dunniae* (Gradual Decline) and Punctidae sp. 64 (Nationally Endangered) are known from this site (Brook 2002, Fred Brook pers. comm.). Five Hochstetter's frogs were recorded again in the stream on the northern side of the road in 1994 (DOC Bioweb 2007), but were absent when resurveyed in 2005, with stock disturbance and silt smothering being the apparent causes of the decline (Peter Anderson, DOC, pers. comm.).

Significance

The two major ecological units of this site are representative of their types: (a) totara forest on moderate hillslope and (b) totara–taraire forest on moderate hillslope and in gully. Parts of these types occur on limestone. Limestone geology and the vegetation it supports is regionally distinctive. Kenny & Hayward (1996) have ranked the Waipu Cave System as regionally important for geomorphology, because it includes the largest cave passage in Northland and some fossil bone deposits, and it is also considered to be a soil site of national importance (Arand *et al.* 1993 – specifically the Waipu Caves Road Scenic Reserve). Although in parts the vegetation is in poor condition due to stock disturbance (particularly in the lower areas around the caves), this site provides an important ecological linkage between North River Forest (Q07/117) and Ruakaka Forest (Q07/121). One threatened plant species (*Doodia mollis*) and two regionally significant plant species (carmine rata and tree fuchsia) are present. Five threatened fauna species (kukupa, kauri snail, Hochstetter's frog, *Amborhytida dunniae*, and Punctidae sp. 64) use this site. Approximately 20% of the site is formally protected. 70.5 ha at the centre of this site is in Waipu Caves Road Scenic Reserve (DOC-administered) and there is a smaller (3.2 ha) Scenic Reserve (WDC) at the main access point to the Waipu Caves. All ecological units have some representation in the protected areas.

* The *Liarea turriculata* species complex is currently ranked 'not threatened'; however, it is considered an invertebrate for which insufficient information is known on it, and which may be of conservation concern (McGuinness 2001).

RUAKAKA RIVER FOREST REMNANTS

Survey no.	Q07/119
Survey date	10 November 2006
Grid reference	Q07 359910 (39 remnants)
Area	104.3 ha
Altitude	20–60 m asl

Ecological units

- (a) Totara–kahikatea forest on alluvium (87%)
- (b) Totara treeland on alluvium (8%)

Landform/geology

Stream channels containing Holocene alluvium, cut into Late Pleistocene (last interglacial) constructional terrace on alluvial and/or estuarine deposits.

Vegetation

This site comprises a discontinuous ribbon of indigenous riverine floodplain forest on the alluvial plains formed by the Ruakaka River and its tributaries (Waikopakopa Stream, Waipapa Stream, Tauroa Stream, and Waiwarawara Stream). A portion of the Waikopakopa Stream occurs in the Whangarei Ecological District and has already been described in the relevant PNA report (site Q07/047, Manning 2001). This site exists in a landscape of intense pastoral agriculture, and the amount of effective riparian fencing varies considerably from property to property. Several areas of exotic forest dominated by crack willow, Chinese privet or walnut (*Juglans* sp.) are scattered along the river margins, but these have not been included in the site. Possums are present (SSBI Q07/H111).

The main forest type has abundant totara with kahikatea common (a). Kowhai, kanuka and crack willow occur frequently, with occasional rewarewa, titoki, ti kouka, matai, puriri, manatu, karaka, houhere, pukatea, kohuhu, mapou, karamu and nikau. Most forest remnants are 50–100 m wide, and the understorey is often badly infested with riparian weeds, for example tradescantia, montbretia, Chinese privet, creeping buttercup, jasmine, passionfruit, elaeagnus, coral tree, Jerusalem cherry, inkweed, and woolly nightshade. In some fenced areas the understorey is dominated by divaricating plant species including turepo and small-leaved *Coprosma* species (Peter Anderson, DOC, pers. comm.), which is an uncommon community in Waipu ED. Upstream areas of the Waikopakopa Stream have sparse, grazed totara treeland (b) with frequent kanuka and crack willow, and occasional kahikatea, karaka, houhere, titoki, ti kouka, kowhai, walnut, and Chinese privet.

Significant flora

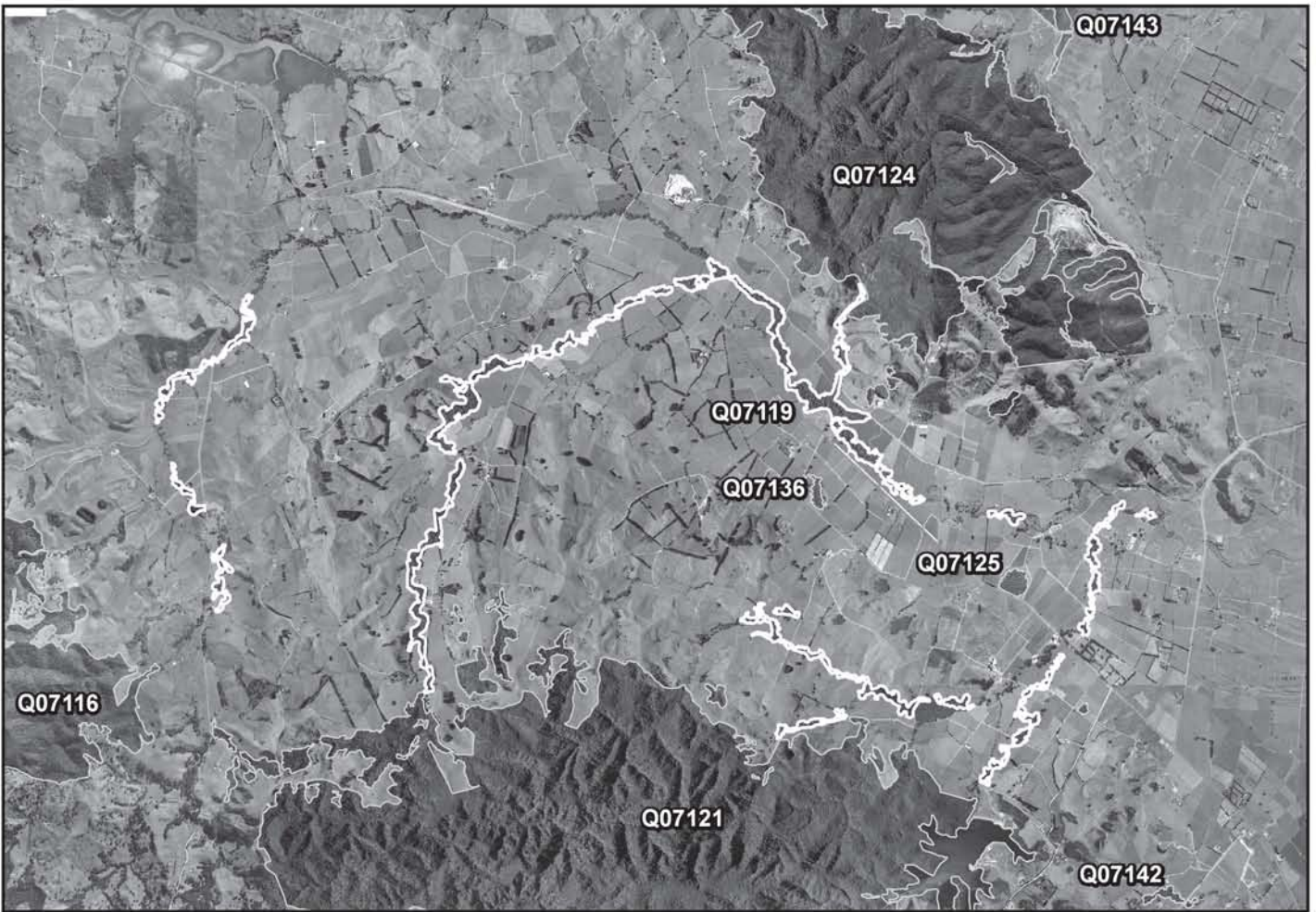
Manatu (regionally significant).

Fauna

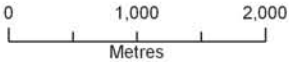
Grey duck (Serious Decline), kukupa (Gradual Decline), pukeko, spur-winged plover, NZ kingfisher, grey warbler, fantail, silvereye, and tui were recorded in 1993 (SSBI Q07/H111). Black shag (Sparse), little shag, kukupa, fantail, tui, grey warbler, and welcome swallow have been recorded here recently (Wildland Consultants 2006). Shining cuckoo was recorded in the current survey.

In 1981 longfin eel (Gradual Decline), shortfin eel, redfin bully, common bully, and koura were recorded in tributaries of the Ruakaka River within this site. In addition, shortjaw kokopu (Sparse)* and banded kokopu (regionally significant) were known







* This may have been a misidentification (Peter Anderson, DOC, pers. comm.).

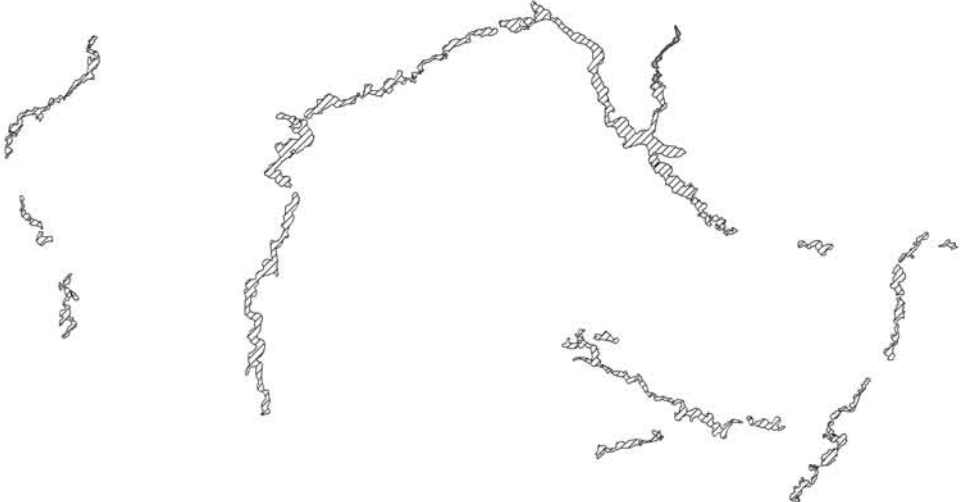


Q07/119 Ruakaka River Forest Remnants



Habitat Type

-  Forest
-  Shrubland
-  Wetland
-  Duneland/Sandfield
-  Estuarine
-  Rockland



from a small Ruakaka River tributary above Fulton Road in the Takahiwai Forest (Q07/124) (NIWA 2007).

Significance

This lowland river complex contains the best representative examples in Waipu ED of a formerly extensive floodplain forest type (with manatu, a regionally significant plant species). Floodplain forest is also a nationally rare habitat type. Four threatened fauna species (grey duck, kukupa black shag, and longfin eel) have been recorded in the site. It is recognised as a wildlife corridor linking Ruakaka Forest (Q07/121), Takahiwai Forest (Q07/124) and Mangapai Caves Road Forest and Shrubland (Q07/116) (SSBI Q07/H111). Some of the remnants have been fenced to exclude livestock (Wildland Consultants 2006), but most are grazed and severely impacted by pest plants and animals. The streams in this catchment support a range of fish and aquatic bird species including five threatened species, and one regionally significant species. The forest and treeland remnants provide some protection to the riparian margins, though large stretches remain open and unvegetated, with breaks between remnants up to 500 m in length. Potential impacts of construction of a proposed rail route between the main trunk line and Marsden B power station are loss of floodplain forest, disruption of movement corridors for animals and erosion impacting on instream fauna (Wildland Consultants 2006). Approximately 2.5% of the total site area is protected. 2.37 ha of the site is within the Ruakaka River Marginal Strip No. 1 (DOC-administered), 0.16 ha within a local purpose reserve (WDC) and 0.1 ha within the Springfield Domain Recreation Reserve (WDC).

CAVES ROAD FOREST

Survey no.	Q07/120
Survey date	11 November 2006
Grid reference	Q07 350840 (9 remnants)
Area	171.9 ha (171.0 ha forest, 0.8 ha wetland)
Altitude	31–220 m asl

Ecological units

- (a) Kanuka forest on moderate hillslope and in gully (55%)
- (b) Totara-kanuka forest on moderate hillslope (20%)
- (c) Totara-kanuka treeland on moderate hillslope (10%)
- (d) Taraire forest on gentle hillslope (5%)
- (e) Nikau forest on moderate hillslope (5%)
- (f) Kauri-rimu forest on ridge (2%)
- (g) Kahikatea forest on gentle hillslope (1%)
- (h) Rimu-tanekaha forest on ridge (1%)
- (i) Open water (constructed ponds) (1%)

Landform/geology

Hillslopes and gullies underlain by Mesozoic greywacke (Waipapa Terrane), Oligocene limestone karst (Whangarei Limestone, Te Kuiti Group), and Miocene sandy mudstone and bluff-forming sandstone (Waitemata Group).

Vegetation

This is a diverse but highly fragmented area of indigenous forest situated directly north of Waipu Caves Road and west of Ormiston Road, where it is closely linked with North River Forest (Q07/117), Ormiston Road Forest Remnants (Q07/135), Waipu Caves Forest (Q07/118) and Waipu Caves Road Wetland (Q07/123). Small parts of the site also extend east of Ormiston Road and south of Waipu Caves Road a short way down steep limestone ravines. This site has been affected by piecemeal clearance for traditional pastoral agriculture as well as for 'lifestyle blocks', which has resulted in the planting of various tree crops (e.g. olives and fruit trees) and non-ecosourced indigenous species around the forest margins, e.g. karo, taupata, harakeke and *Astelia banksii*. There are also numerous invasive weed species present, e.g. arum lily, tradescantia, ivy, Chinese privet, and coastal banksia. Most areas are not fenced and are grazed by stock.

The vegetation over most of the site is characterised by young kanuka forest (a) with frequent totara and mamaku, and occasional ponga, nikau, kauri, kahikatea, rimu, and radiata pine; especially on the western side, which was allowed to regenerate from farmland around 50–60 years ago (Ian Fox pers. comm.). Within gullies the kanuka forest tends to have frequent taraire and kahikatea, and may also include occasional puriri, karaka, towai and tanekaha. Most of the northern half of the site was not easily visible during this survey, therefore its vegetation cover has been estimated from aerial photography (flown in January 2004).

Totara-kanuka forest (b) and treeland (c) occurs in stock-damaged areas on limestone geology around the Ormiston Road junction. Within these types puriri and karaka occur frequently, and there are occasional scattered matai, kahikatea, titoki, and puka. Taraire-dominant forest (d) with occasional rewarewa, kauri, tanekaha, puriri and kahikatea occurs on gentle hillslopes at the eastern end of the site. On a south-facing hillslope to the north of Waipu Caves Road there is a particularly dense, diverse and distinctive forest type which has abundant nikau (e) and a high number of locally occurring canopy species including pukatea, kiekie, taraire, puriri, kahikatea, titoki, lancewood, and toro. Ridges generally have kanuka forest (a), but can also support tall stands of secondary kauri and rimu with frequent tanekaha and kanuka (f), or rimu and tanekaha with frequent kauri and kanuka (h). There is a relatively small area of secondary kahikatea forest (g) at the toeslope of a small hill in the very east of the site. This area has frequent rimu and occasional pukatea, kanuka, and totara.

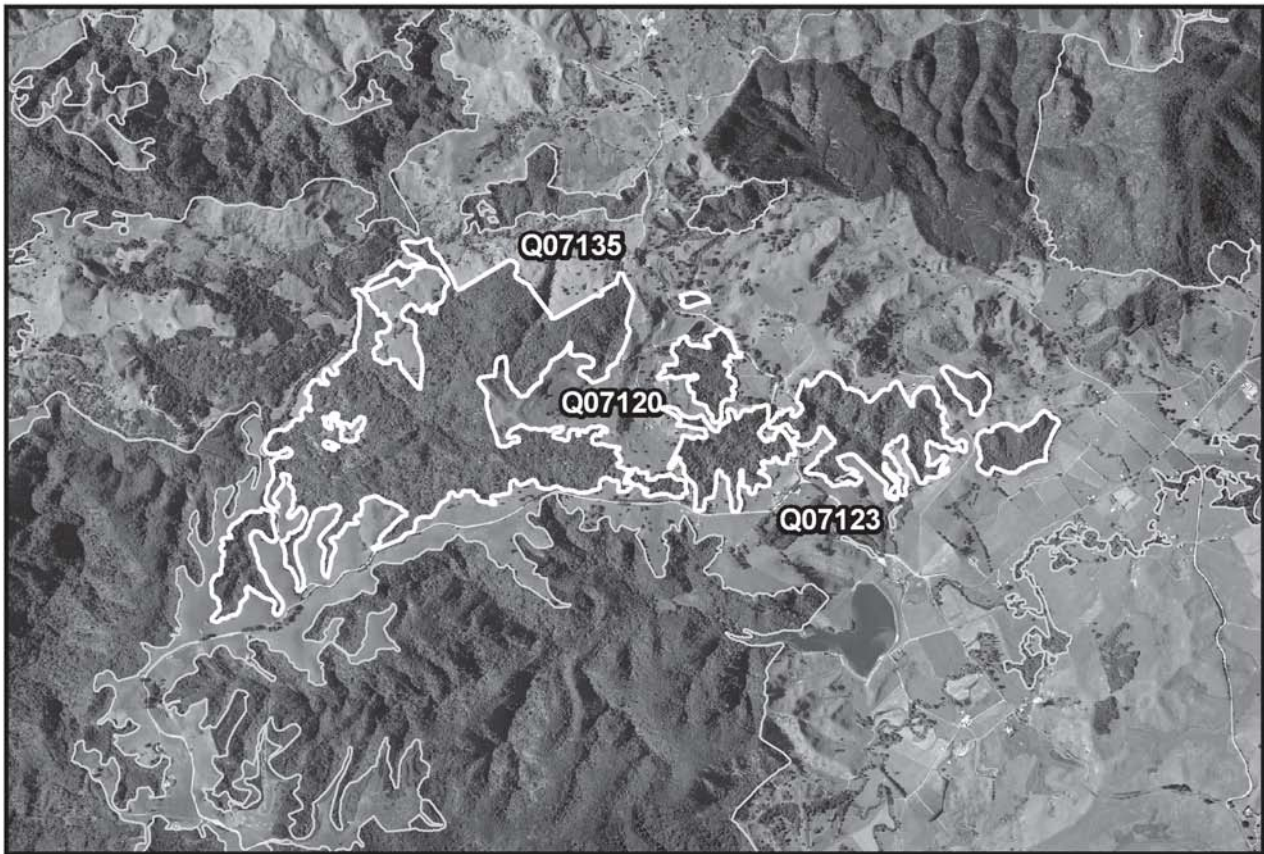
Two constructed ponds on Ormiston Road have been included within this site because they provide habitat for uncommon water birds.

Significant flora

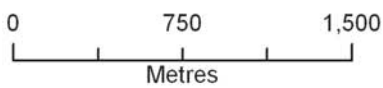
Kaikomako (regionally significant) is present under nikau forest (Ian Fox pers. comm.).

Fauna







Northernmost known population of Hochstetter's frog (Sparse) recorded in 1977 (SSBI Q07/H058). New Zealand dabchick (Sparse) and Australasian little grebe (Coloniser; regionally significant) recently reported from dam on Ormiston Road (John Kendrick pers. comm.). Kukupa (Gradual Decline) seen in nikau forest (current survey).



Q07/120 Caves Road Forest



Habitat Type

-  Forest
-  Shrubland
-  Wetland
-  Duneland/Sandfield
-  Estuarine
-  Rockland



Significance

This site contains a representative example of (c) nikau forest on moderate hillslope, which is diverse, unrecorded elsewhere in the ED, and contains a regionally significant plant species (kaikomako). Three threatened fauna species (Hochstetter's frog, NZ dabchick, and kukupa) and one regionally significant fauna species (Australasian little

grebe) have been recorded. Also Hochstetter's frog reaches its northern limit of distribution in this site. This site provides an ecological linkage between North River Forest (Q07/117) and Ruakaka Forest (Q07/121). Parts of the site are on limestone geology. Limestone geology and the vegetation it supports is regionally distinctive. The eastern part of the site is impacted by pest plants, habitat fragmentation, and potential genetic pollution through planting of non-ecosourced species.

RUAKAKA FOREST

Survey no.	Q07/121
Survey date	10 November 2006
Grid reference	Q07 363874 (19 remnants)
Area	1,699.3 ha (1,653.4 ha forest, 5.9 ha shrubland, 39.9 ha wetland)
Altitude	20–260 m asl

Ecological units

- (a) Kanuka-rimu-tanekaha forest on moderate to steep hillslope and ridge (45%)
- (b) Kauri forest on ridge (10%)
- (c) Totara forest on moderate to steep hillslope and in gully (10%)
- (d) Kanuka forest on gentle hillslope (5%)
- (e) Towai forest on moderate hillslope (5%)
- (f) Taraire-totara forest in gully (4%)
- (g) Totara-mamaku forest on moderate hillslope (4%)
- (h) Open water (constructed dam) (4%)
- (i) Taraire forest on steep hillslope and in gully (3%)
- (j) Tanekaha-kanuka forest on moderate hillslope and ridge (2%)
- (k) Totara-rewarewa forest in gully head (1%)
- (l) Kanuka-mamaku forest on moderate hillslope and in gully head (1%)
- (m) Kahikatea-totara forest in gully (1%)
- (n) Kauri-rimu forest on steep hillslope (1%)
- (o) Nikau-ponga forest in gully (1%)
- (p) Kanuka shrubland on steep hillslope and cliff (1%)
- (q) Mahoe-kanuka shrubland on ridge (1%)
- (r) Pate-ti kouka shrubland on ridge (1%)

Landform/geology

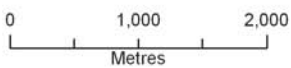
Steep hill country with deeply incised valleys and gullies; predominantly underlain by Mesozoic greywacke (Waipapa Terrane), but with small areas of Miocene sandy mudstone (Waitemata Group).

Vegetation

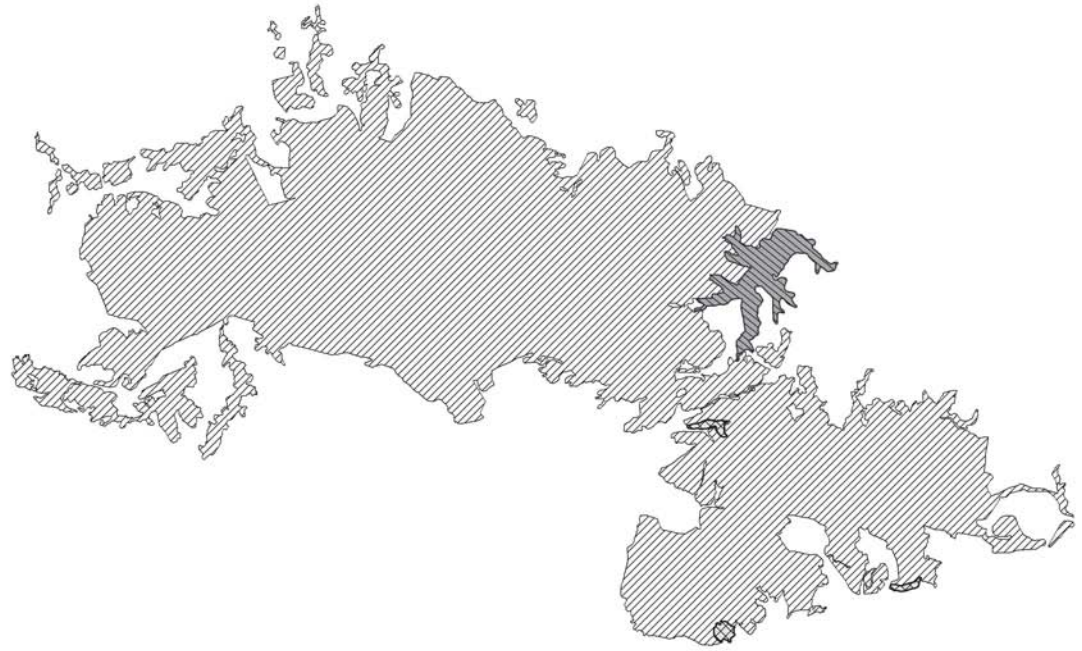
Ruakaka Forest is one of the largest and most diverse areas of indigenous forest in Waipu Ecological District. It is located on steep hill country inland of Ruakaka, rising to a high point of 262 m asl known as Kukunui. This site is generally elongated from west to east, extending in an arc approximately 9 km long and 2 km wide from Ormiston and Kukunui Roads in the west, to Prescott Road (where the forest narrows



Q07/121 Ruakaka Forest



- Habitat Type
- Forest
 - Shrubland
 - Wetland
 - Duneland/Sandfield
 - Estuarine
 - Rockland



to about 1 km wide), and around to Mountfield Road in the southeast. Parts of the headwaters of the Waipapa Stream, Waikopakopa Stream, Tauroa Stream, Waiwarawara Stream, Pohuenui Stream and some unnamed streams draining into

Doctor's Hill Road Wetland (Q07/127) lie within this site. The biggest forested catchment is that of the Waipapa Stream in the west. The Waiwarawara Stream was dammed in 2002 and fully flooded in October 2003 for the purpose of providing a drinking water supply to the Ruakaka area. It is also stocked with brown trout for recreational fishing (Andrew Venmore pers. comm.). The open water habitat within Wilson's Dam (h) is included within the Ruakaka Forest site because it is bordered almost entirely by indigenous forest (a small area of forest was flooded during its creation) and may provide habitat for indigenous species, e.g. water birds and invertebrates.

It appears that all indigenous vegetation within Ruakaka Forest is secondary in origin, varying in age from decade-old shrublands to c. 150–200 year-old forest.

The major ecological unit is kanuka-rimu-tanekaha forest with frequent kauri (a), which occurs over large areas of broad ridges and moderately to steeply sloping terrain, generally with a northern aspect. Within the canopy there are also occasional totara, kahikatea, rewarewa, mamaku, lancewood, mahoe, kohuhu, mamangi, towai, tarata, and mapou. A younger and more kanuka-dominant forest type (d) occurs on lower, gentle hillslopes throughout. This type is associated with frequent kauri and occasional rimu, totara, and tanekaha. Typical understorey species include regenerating kauri, tanekaha, totara, kahikatea, rimu, lancewood, towai, and tarata, and there is a dense shrub tier of *Gabnia xanthocarpa*, *G. lacera*, hangehange, *Coprosma spathulata*, mamangi, mingimingi, turutu, *Lycopodium deuterodensum*, ponga, ti kouka, mapou, kiokio, and *Alseuosmia* spp. On disturbed edges prickly hakea can be present. Many of the prominent ridge lines, especially those radiating down from Kukunui, have dense stands of kauri (b) in association with frequent kanuka and rewarewa, and occasional totara. There are also localised stands of kauri mixed with rimu on steep, dry terrain (n). Forest with abundant tanekaha over kanuka (j) often occurs on north-facing ridges and steep hillslopes at lower altitudes.

On southern hillslopes, totara forest (c) with a diverse range of canopy associates is present. Totara is abundant, but is associated with many other species, including towai, kauri, kahikatea, nikau, miro, puriri, tanekaha, taraire, mamaku, kohekohe and rewarewa. More disturbed and younger totara-mamaku forest with frequent kahikatea (g) occurs on the margins, especially near Kukunui Road. Towai forest (e) with frequent ponga, rewarewa, and mamaku, and occasional taraire, tawa, nikau, karaka, and puka is present on some south-facing hillslopes, especially in the Pohuenui Scenic Reserve and the McKenzies of Limestone Hill Park Scenic Reserve. Taraire forest (i) with frequent puriri and karaka, and occasional tawa and kohekohe also occurs on southern hillslopes and gullies.

Broadleaf forest in gullies is often very diverse. However it was not readily visible from accessible survey points, and most north-draining gullies were only visible from a distance of 2 km. Nikau-ponga forest (o) was described from one location in the Waipapa Stream catchment. Much of the upper Waipapa Stream catchment has been deforested except for several deep gullies extending south to Ormiston Road, which allowed these gully forest types to be seen more easily. Taraire-totara forest (f) is the main forest type in this area; it incorporates frequent nikau, rewarewa, ponga, kahikatea, and supplejack, and occasional pate, karaka, rimu, tawa, mamaku, mahoe, puka and kohekohe. There are also small areas of totara-rewarewa forest (k) and kanuka-mamaku forest (l) in the heads of these gullies. Mexican devil and tradescantia infestations are apparent within these gully areas, probably exacerbated

by disturbance within the catchment around them. The small part of the Waikopakopa Stream catchment within this site supports narrow areas of kahikatea-totara forest with frequent kanuka (m) surrounded by pasture.

Only small areas of shrubland are present and include kanuka shrubland (p), mahoe-kanuka shrubland (q) and pate-ti kouka shrubland (r), all of which occur around the margins of the site. Pate-ti kouka shrubland occurs on more poorly drained sites than the other two types.

Significant flora

Maire tawake (regionally significant), gully tree fern (regionally significant) and tree fuchsia (regionally significant) recorded in 1991 (SSBI Q07/H055). Hard beech (regionally significant) is present (Peter Anderson, DOC, pers. comm.).

Fauna

North Island brown kiwi (Serious Decline), NZ kingfisher, welcome swallow, grey warbler, fantail, silvereve, and tui were recorded in 1978, however North Island brown kiwi are probably no longer present, as they were not found anywhere in Waipu Ecological District in 1992 (Miller and Pierce 1995). During a 1992 survey kukupa (Gradual Decline), longfin eel (Gradual Decline), tomtit (regionally significant), common bully, koura, and copper skink were found at this site. Native frogs were searched for in 1992, but not found (SSBI Q07/H055).

In 1988 the upper Waiwarawara Stream supported longfin eel, shortjaw kokopu (Sparse),* banded kokopu (regionally significant), shortfin eel, redfin bully, and koura. However, the situation may have changed since damming of the river in 2002. Banded kokopu were also known from the upper Waipapa Stream catchment in 1981 (NIWA 2007).

Observations by local landowner Jackie Adenbrook: Kauri snails (Gradual Decline) are regularly found crossing Ormiston Road at the western end of Ruakaka Forest; kukupa and morepork populations have declined over the past decade; possum, mustelid and ship rat numbers remain high; three North Island kaka (Nationally Endangered) were sighted in the early 2000s and remained in the area for several days before they were shot by local children.

Significance

Ruakaka Forest is the second largest contiguous area of indigenous forest in the ED (after Mareretu Forest Q08/220). Wilson's Dam is the largest freshwater body in the ED, though it has only recently been created and indigenous fauna are not yet well established. Except for the dam (which is constructed) all of the ecological units are representative individually of their types. When considered collectively the different ecological units are representative of a secondary forest sequence on greywacke and sandy mudstone. Several threatened and regionally significant species have been recorded here (four regionally significant plant species—maire tawake, gully tree fern, tree fuchsia, and hard beech; five threatened fauna species—kukupa, longfin eel, shortjaw kokopu, kauri snail, and North Island kaka; and two regionally significant fauna species—tomtit and banded kokopu). Feral browsing animals, pigs and stock are present and there are several localised weed infestations, e.g. Mexican fireweed and mistflower (SSBI Q07/H055). 442 ha is within McKenzies of Limestone Hill Park Scenic Reserve and Pohuentui Scenic Reserve (DOC-administered) collectively cover 442 ha of the site, and 294.3 ha lie within the Ruakaka Forest Conservation Area

* This may have been a misidentification (Peter Anderson, DOC, pers. comm.).

(DOC-administered). A further 136 ha of the site lies within local purpose reserve land (WDC) in the Waiwarawara catchment (around Wilson's Dam). A Queen Elizabeth II Open Space Covenant protects 6.5 ha of forest remnants on the northern edge. Approximately 52% of the site is therefore protected.

TAKAHIWAI FOREST

Survey no.	Q07/124
Survey date	16 November 2006
Grid reference	Q07 379937 (11 remnants)
Area	641.2 ha (635.3 ha forest, 4.2 ha wetland, 1.7 ha shrubland)
Altitude	15-195 m asl

Ecological units

- (a) Kanuka forest on moderate hillslope (65%)
- (b) Kauri-kanuka forest on ridge-top (30%)
- (c) Totara forest on moderate hillslope (2%)
- (d) Open water in constructed lake (1%)
- (e) Totara-puriri forest in gully head (<1%)
- (f) Manuka shrubland on moderate hillslope (<1%)
- (g) Karaka-nikau-kanuka forest in gully (<1%)
- (h) Kanuka-puriri treeland in gully (<1%)
- (i) Raupo reedland in gully (<1%)

Landform/geology

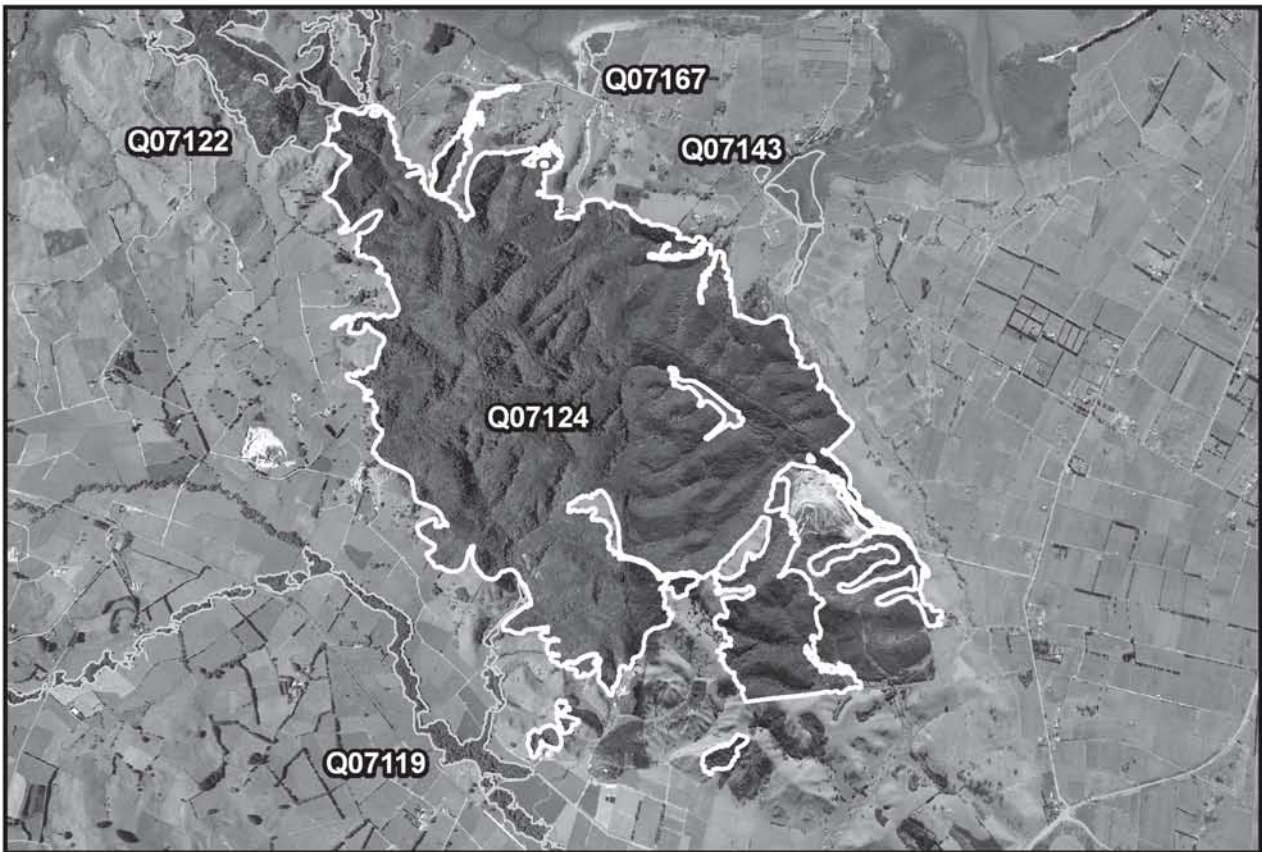
Dissected hill country on Mesozoic greywacke (Waipapa Terrane).

Vegetation

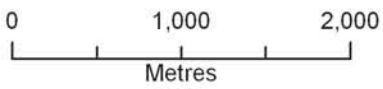
This site comprises one large and 10 small forest remnants between SH 1 and Whangarei Harbour. Most of the vegetation is secondary; most of the hillslopes are kanuka forest (a) although there are small areas of totara forest (c) and manuka shrubland (f). Kauri-kanuka forest (b) is dominant on many of the ridges. Small patches of more diverse totara-puriri (e) and karaka-nikau-kanuka (g) forest remain in the gullies and gully heads. These coastal broadleaf remnants are likely to be representative of the vegetation that was formerly extensive in the area, prior to human clearance. On the northwestern edge of the remnant is a small area of kanuka-puriri treeland (h) where the forest grades into pasture. Examination of the aerial photographs suggested that a gully in the south east of the remnant has an area of raupo reedland (i), and the headwaters of a tributary of the Ruakaka River has been dammed to form an artificial lake (d).

Significant flora







Northern rata (regionally significant) and maire tawake (regionally significant) recorded in 1990, and *Pratia angulata* (regionally significant) and hard beech (regionally significant) recorded in 1993 (SSBI Q07/H047). *Coprosma rigida* (regionally significant) has been recorded from here (L. Forester, NRC, pers. comm., date unknown).

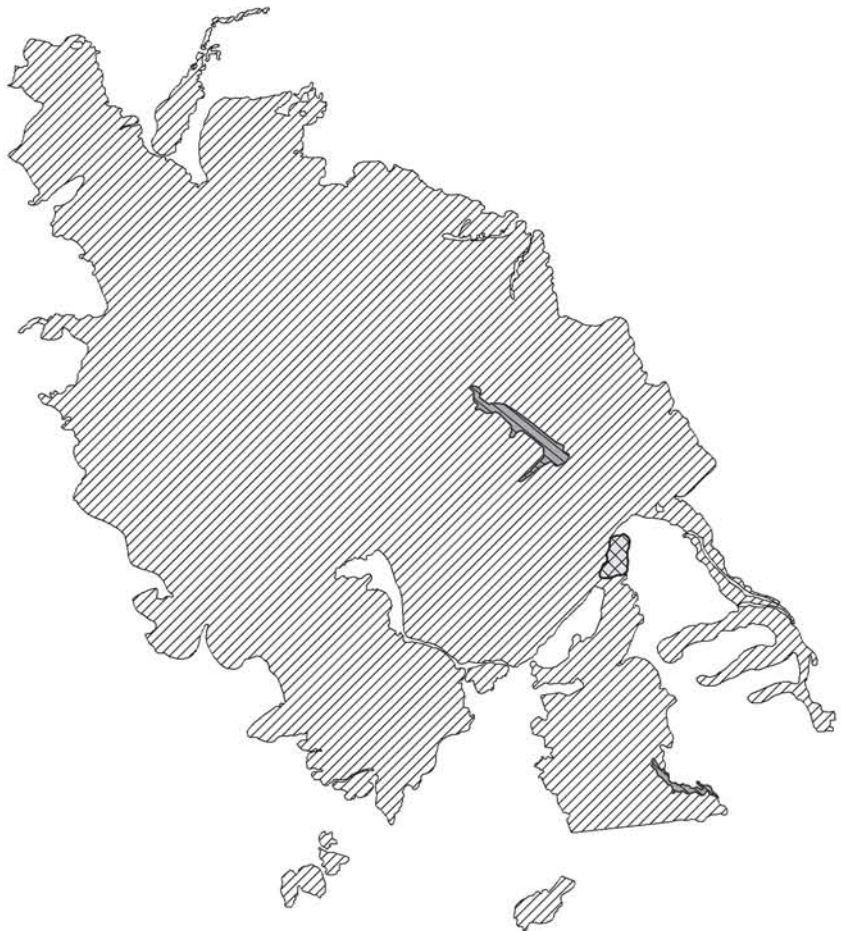


Q07/124 Takahiwai Forest



Habitat Type

-  Forest
-  Shrubland
-  Wetland
-  Duneland/Sandfield
-  Estuarine
-  Rockland



Fauna

Kukupu (Gradual Decline), morepork, welcome swallow, grey warbler, North Island fantail, silvereye, and tui recorded in 1992 (SSBI Q07/R07/H047). Tomtit (regionally significant) recorded in 1978 (SSBI Q07/R07/H 047). New Zealand kingfisher and *Amborhytida dunni* (Gradual Decline) were recorded in 1993 (SSBI Q07/R07/H047 #1).

Longfin eel (Gradual Decline), shortjaw kokopu (Sparse),* banded kokopu (regionally significant), and koura were recorded in tributaries of the Ruakaka River, on the southern slopes of Takahiwai Forest, above Fulton Road, in 1981 (NIWA 2007).

Significance

This site contains seven representative ecological units: (a) kanuka forest on moderate hillslope, (b) kauri-kanuka forest on ridge-top, (c) totara forest on moderate hillslope, (e) totara-puriri forest in gully head, (f) manuka shrubland on moderate hillslope, (g) karaka-nikau-kanuka forest in gully, and (h) kanuka-puriri treeland in gully. Takahiwai Forest is a relatively large area and of compact shape, however grazing occurs on the forest edges, and in places is resulting in canopy breakdown and the formation of treeland (h). The site supports three threatened fauna species (kukupu, *Amborhytida dunni*, and longfin eel), two regionally significant fauna species (tomtit and banded kokopu), and five regionally significant plant species (northern rata, hard beech, maire tawake, *Pratia angulata*, and *Coprosma rigida*). Takahiwai Forest provides important riparian protection for tributaries of the Ruakaka River, and Takahiwai Stream. Approximately 65.0 ha of this site is within a scenic reserve (DOC-administered) (Mata Farm Settlement Scenic Reserve).

TAUROA FLOODPLAIN FOREST REMNANTS

Survey no.	Q07/125
Survey date	10 November 2006
Grid reference	Q07 388901 (2 remnants)
Area	4.7 ha
Altitude	20 m asl

Ecological unit

(a) Kahikatea forest on alluvium (100%)

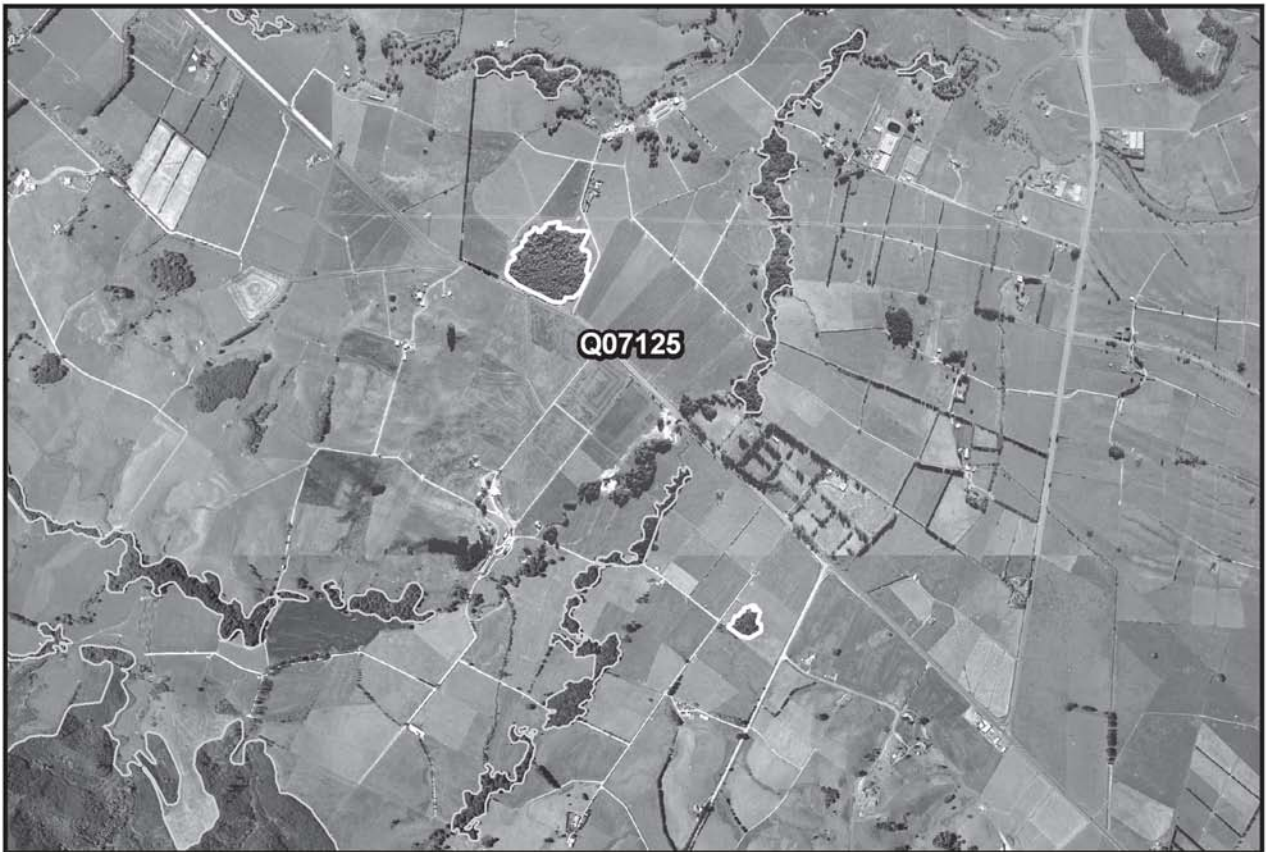
Landform/geology

Terrace on Late Pleistocene (last interglacial) alluvial and/or estuarine deposits.

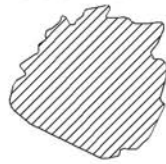
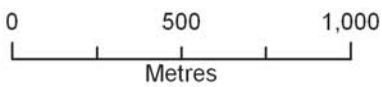
Vegetation

This site comprises two kahikatea forest remnants on alluvial floodplains near the confluence of the Tauroa Stream and the Ruakaka River. The larger remnant, which is 2 km southeast of the Flyger Road intersection along State Highway 1, is a dense stand of secondary kahikatea (perhaps 150 years old) associated with frequent puriri and totara, and occasional ti kouka, kanuka, rimu, and pukatea. This remnant appears to be entirely fenced, and has a relatively thick understorey of kohekohe, karaka, *Gabnia* spp., small-leaved *Coprosma* species, and occasional Japanese honeysuckle. It is occasionally lightly grazed (Peter Anderson, DOC, pers. comm.).







* This may have been a misidentification (Peter Anderson, DOC, pers. comm.).



Q07/125 Tauroa Floodplain Forest Remnants



Habitat Type

-  Forest
-  Shrubland
-  Wetland
-  Duneland/Sandfield
-  Estuarine
-  Rockland



The smaller remnant is in noticeably worse condition lacking any appreciable undergrowth. The canopy, which is relatively open, comprises secondary pole kahikatea with occasional puriri, totara, ti kouka, and karaka. It has a 3-wire fence, but dead and dying puriri indicate previous heavy grazing and trampling by stock.

Fauna

North Island fantail and silvereye were recorded in 1978, and a North Island kaka (Nationally Endangered) was seen in the Flyger Road area in 1994 (SSBI Q07/H048).

Significance

Forest on alluvial floodplains is nationally rare, hence these small remnants are representative of their type. The larger remnant is in relatively good condition due to the general exclusion of stock, and it is one of the few kahikatea remnants with a relatively intact understorey remaining on floodplains in Waipu ED.

MOUNTFIELD ROAD WETLANDS

Survey no.	Q07/126
Survey date	11 November 2006
Grid reference	Q07 392848 (4 remnants)
Area	2.3 ha
Altitude	40-60 m asl

Ecological units

- (a) Raupo reedland in gully (60%)
- (b) Open water (constructed ponds) (30%)
- (c) Willow weed herbfield in gully (10%)

Landform/geology

Valley floor wetlands on Late Pleistocene (last interglacial) alluvial and/or estuarine deposits, and Holocene alluvium.

Vegetation

This site comprises four separate open water ponds near the quarry on Mountfield Road, two of which have been constructed and two of which are semi-natural. All have some indigenous vegetation around the water margins and provide habitat for indigenous birds. The most common vegetation type is raupo reedland (a), with occasional scattered harakeke, *Carex virgata*, ti kouka and mamaku. This type encircles each pond and extends up to 100 m up gullies feeding into the largest pond in the southwest. On the edges between the raupo reedland and the open water habitat (b) there are frequent *Carex virgata* tussocks standing above the water, often grading into a herbfield dominated by willow weed (c)* with occasional water plantain. The wetlands are surrounded by grazed exotic grassland dominated by Yorkshire fog with occasional dally pine.

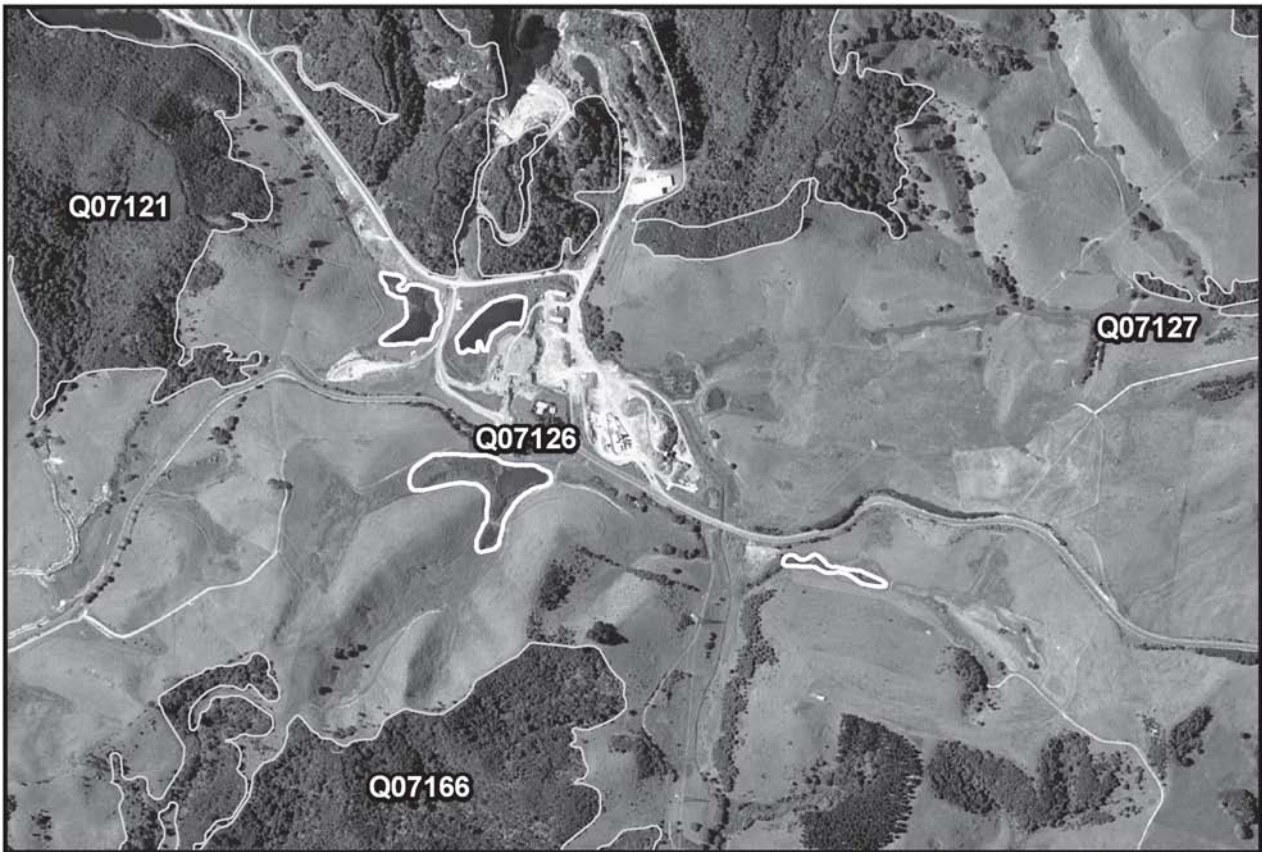
Fauna

Grey duck (Nationally Endangered), spotless crake (Sparse), paradise shelduck, Australasian harrier, pukeko, grey warbler, fantail and silvereye were recorded in 1978 (SSBI Q07/H061). During the current survey a spotless crake tape was played in close proximity to the wetland several times, with no response. NZ kingfisher and welcome swallow were recorded in the site.

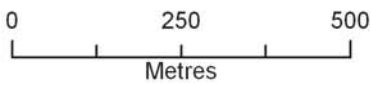
Significance

This site contains small but significant freshwater wetland habitats with representative examples of (a) raupo reedland in gully. Most natural freshwater







* The species of willow weed could not be determined from a distance, but it is likely to be either *Persicaria decipiens* (an indigenous species) or *Polygonum hydropiper* (an exotic species).

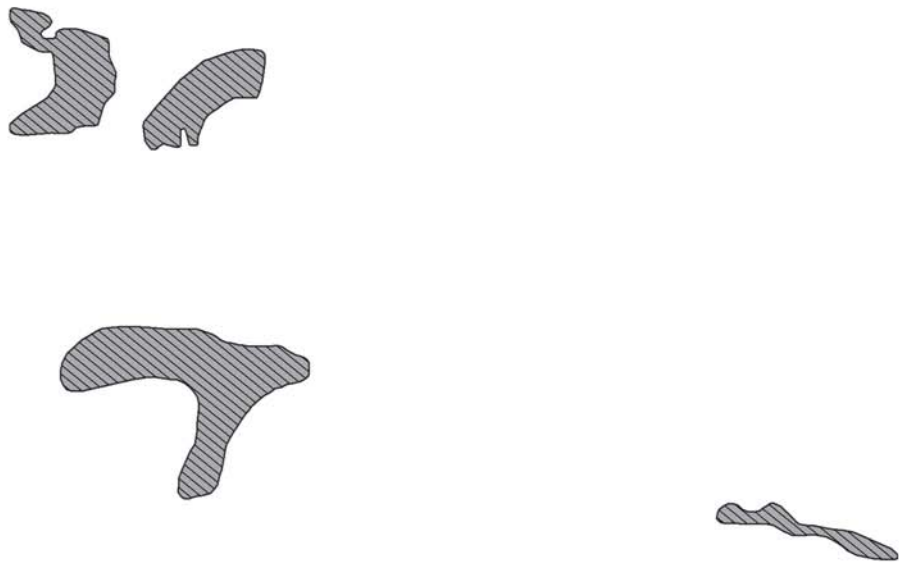


Q07/126 Mountfield Road Wetlands



Habitat Type

-  Forest
-  Shrubland
-  Wetland
-  Duneland/Sandfield
-  Estuarine
-  Rockland



wetlands which were present in the ED in the past have been drained or modified, and now there are only approximately 45 ha of natural or semi-natural wetland remaining. Two threatened bird species (grey duck and spotless crane) may be present but have not been recorded for 18 years. There are heavy grazing and weed impacts.

DOCTOR'S HILL ROAD WETLAND

Survey no.	Q07/127
Survey date	10 November 2006
Grid reference	Q07 413859 (8 remnants)
Area	23.2 ha (5.6 ha forest, 17.6 ha wetland)
Altitude	14–29 m asl

Ecological units

- (a) Reed sweetgrass grassland in gully (45%)
- (b) Raupo reedland in gully (35%)
- (c) *Baumea articulata* reedland in gully (5%)
- (d) Totara forest on steep hillslope (5%)
- (e) Open water in gully (3%)
- (f) Totara treeland on gentle hillslope (3%)
- (g) Bracken fernland in gully (3%)
- (h) Kahikatea treeland in gully (1%)

Landform/geology

Hillslopes of Mesozoic greywacke (Waipapa Terrane) bordering a valley floor wetland ponded behind a Holocene coastal dunefield.

Vegetation

Doctor's Hill Road Wetland is an extensive freshwater wetland located in the gully of an unnamed stream which originates in Ruakaka Forest (Q07/121) and drains into the Ruakaka River Estuary (Q07/130). State Highway 1 crosses the wetland at its lower, eastern end and potentially impedes water flows out of the gully, thus maintaining water levels. Doctor's Hill Road also traverses one area of the wetland and may play a similar role. The entire site is surrounded by grazed paddocks, which are not fenced off from the wetland, and small remnants of contiguous totara forest and treeland (d and f) and kahikatea treeland (h). The forest remnants have been included in the site as they provide perching sites for wetland birds and help to stabilise slopes.

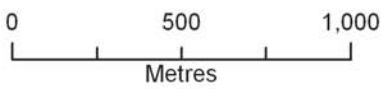
Within the wetland the dominant vegetation types are reed sweetgrass grassland (a) and raupo reedland (b), which both have occasional crack willow, harakeke, ti kouka and wheki around their margins. Small, discrete patches of *Baumea articulata* reedland (c) and bracken fernland (g) with frequent raupo occur; the latter in slightly raised areas which are better drained. Raised areas sometimes also have manuka and/or karamu. There are small but important areas of open water habitat (e) adjacent to the raupo and *Baumea articulata* reedlands, which provide habitat for water birds. The exotic floating fern *Azolla pinnata* forms a variable amount of cover over the water surface in these areas. Manchurian wild rice and alligator weed were noted in 1996 (SSBI Q07/H056). Manchurian wild rice was not found during a field inspection in March 2007 (Brett Miller, Northland Regional Council, pers. comm.).

Fauna







Australasian bittern (Nationally Endangered) recorded in 2003 (Amokura 93, February 2004) and observed again in 2006 during current survey (2 birds). Grey duck (Nationally Endangered), kukupa (Gradual Decline), spotless crane (Sparse), paradise shelduck, pukeko, pied stilt, grey warbler, tui, Australasian harrier, welcome swallow, and fantail have all been recorded here by various observers between 1978

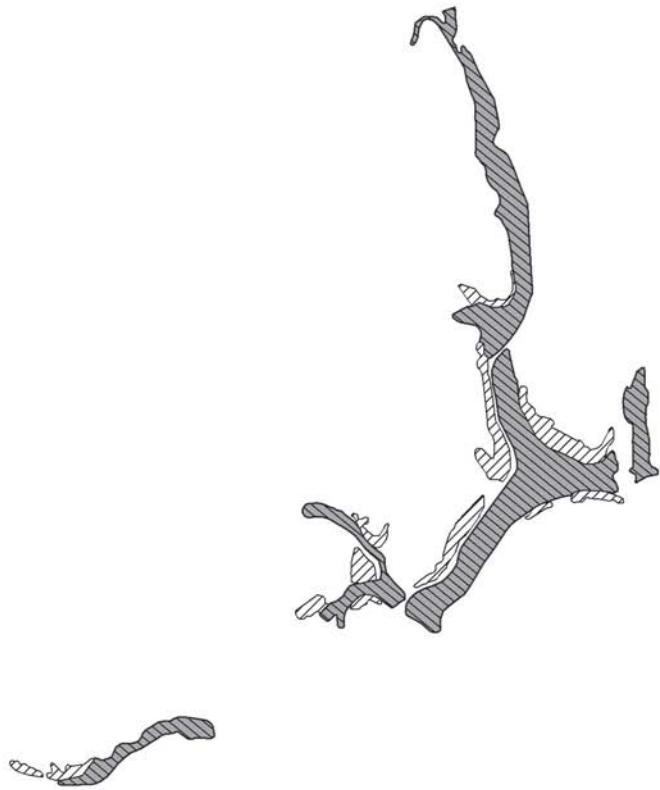


Q07/127 Doctor's Hill Road Wetland



Habitat Type

-  Forest
-  Shrubland
-  Wetland
-  Duneland/Sandfield
-  Estuarine
-  Rockland



and 1996 (SSBI Q07/H056). Spotless crane presence was confirmed during the current study via response to taped calls.

Significance

This is the largest natural freshwater wetland remaining in Waipu ED. Despite modification, grazing, and extensive weed infestation (the dominant species is reed sweetgrass), the site is ecologically significant due to the rarity of wetland habitat and the presence of four threatened bird species (Australasian bittern, grey duck, spotless crane, and kukupa). It is one of only five natural coastal freshwater wetlands remaining in Waipu ED (Q07/131, Q07/141, Q07/127, Q07/129 and R08/001). Freshwater wetlands have been greatly reduced in extent throughout New Zealand, and only approximately 45 ha of natural or semi-natural wetland remains in Waipu ED. There are four representative ecological units: (b) raupo reedland in gully, (c) *Baumea articulata* reedland in gully, (e) open water in gully, and (g) bracken fernland in gully. A small part of the lower end of the wetland (0.22 ha) is within the Ruakaka Conservation Area (DOC-administered), and another small part (0.1 ha) is within the Ruakaka Wildlife Refuge (DOC-administered). Only 1.4% of the total site area is protected.

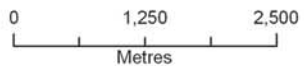
RUAKAKA DUNELANDS

Survey no.	Q07/128
Survey date	13 November 2006
Grid reference	Q07 430847 (6 remnants)
Area	725.7 ha (154.9 ha duneland, 91.5 ha forest, 474.8 ha shrubland, 4.7 ha wetland)
Altitude	0–20 m asl

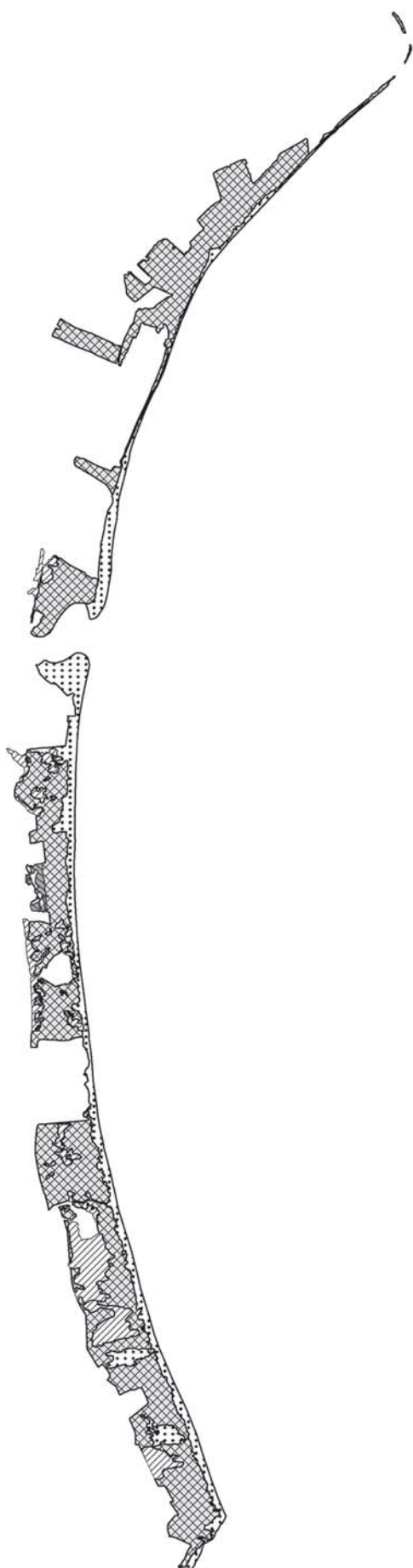
Ecological units

- (a) Gorse–pampas scrub on sand dune (65%)
- (b) Sandfield habitat on beach and sand dune (10%)
- (c) Pohuehue shrubland on sand dune (4%)
- (d) Sweet vernal–haretail grassland on sand dune (3%)
- (e) *Kunzea ericoides* var. *linearis* forest on sand dune (2%)
- (f) Maritime pine treeland on sand dune (2%)
- (g) Brush wattle–Chinese privet–mapou scrub on sand dune (2%)
- (h) Radiata pine forest on sand dune (1%)
- (i) Spinifex grassland on sand dune (1%)
- (j) Pingao sedgeland on sand dune (1%)
- (k) Tree privet–Chinese privet scrub on sand dune (1%)
- (l) Pohuehue–*Coprosma acerosa* shrubland on sand dune (1%)
- (m) Pampas–ginger scrub on sand dune (1%)
- (n) Sweet vernal grassland on sand dune (1%)
- (o) Knobby clubrush–pohuehue sedgeland on sand dune (1%)
- (p) Haretail–gazania–marram grassland on sand dune (1%)
- (q) Harakeke–gorse flaxland on sand dune (1%)
- (r) Glasswort herbfield in estuary (1%)
- (s) Open water (constructed pond) (1%)

Q07/128 Ruakaka Dunelands



Habitat Type



Landform/geology

Holocene coastal dunefield and beach sands.

Vegetation

This site comprises an approx. 19 km long band of sand dunes extending from Marsden Point in the north to the Waipu River Estuary (Q08/228) in the south, varying in width from approximately 800 m at the widest to 30 m at the narrowest. Adjacent land use on sand dunes and alluvial flats is generally intense, being a mixture of industrial, pastoral, residential and recreational activities which are serviced by State Highway 1 and other heavily transited coastal roads. Several of these roads run north-south near the western boundary of the site.

Whilst overall the vegetation is dominated by exotic plant species, there is still a moderate diversity of indigenous species remaining.

Moving inland from the top of the intertidal zone, the first terrestrial zone is a fine grained sandfield habitat (b) with occasional sea rocket (both *Cakile edentula* and *C. maritima*) scattered along the strand line. Glasswort herbfield (r) is present on gently sloping estuarine beaches next to the Ruakaka River Estuary (Q07/130), and tends not to occur on the open coast.

On the seaward slope of the foredune there is spinifex grassland (i) with occasional lupin, shore bindweed, purple groundsel and pingao, as well as a few discrete, dense areas of pingao sedgeland (j). From the top of the foredune back, exotic species become more prevalent. There are large areas of sweet vernal-haretail grassland (d) with frequent *Carex testacea*, gorse, ripgut brome, pohuehue, and knobby clubrush, and occasional large quaking grass, catsear, broomrape, shore bindweed, catchfly, South African iceplant, and *Coprosma acerosa*. The most common vegetation type at the back of the foredune (i.e. sheltering on the landward-facing slope) is low, tangled pohuehue shrubland (c) with frequent purple groundsel, lupin, knobby clubrush, sweet vernal, and haretail, and occasional sand wind grass, *Cortaderia splendens*, *Oxalis rubens*, *Carex testacea*, South African iceplant, dimorphotheca, smilax, apple of Sodom, bracken, gorse and gazania. There are several minor vegetation types forming mosaics at the back of the foredune, including knobby clubrush-pohuehue sedgeland (o), haretail-gazania-marram grassland (p) and pohuehue-*Coprosma acerosa* shrubland (l), however all of these are essentially similar communities comprising varying percentages of the same species. Marram is uncommon and occurs only locally.

Immediately behind the foredune the most extensive vegetation type begins. This type extends to the inland boundaries of the site often for hundreds of metres. It comprises exotic scrub dominated by gorse and pampas (a), associated with a multitude of species, including *Haloragis erecta*, pohuehue, mingimingi, patotara, *Lepidosperma laterale*, *Coprosma acerosa*, climbing asparagus, *Acacia sophorae*, willow-leaved hakea, radiata pine, brush wattle, kikuyu, Yorkshire fog, wild carrot, aristeia, veldt grass, watsonia, and tall fescue. This area also encompasses two small areas of exotic scrub; brush wattle-Chinese privet-mapou scrub (g) with frequent woolly nightshade, tree privet, and pampas, and tree privet-Chinese privet scrub (k) which has frequent mapou and ginger, and occasional ti kouka.

Within this scrub there are several 'islands' of wilding radiata pine forest (h) and *Kunzea ericoides* var. *linearis* forest (e) rising above the level of the surrounding vegetation. The latter is composed of a distinct variety of kanuka which is specific to coastal sandy soils the northern North Island. Associated species include manuka, radiata pine, gorse, mingimingi, turutu, cotoneaster, mapou, hangehange, pohuehue,

Lepidosperma laterale, and *Baumea juncea*. Manuka is common in the canopy on the edges of the kanuka stands and dead manuka stems are common in the understorey, suggesting that manuka may have colonised the same site earlier and facilitated kanuka forest development. Dead gorse is also often found beneath the kanuka canopy.

At the entrance to the campground at Uretiti there is a stand of maritime pine treeland (f) associated with frequent tree privet, kanuka, mapou, brush wattle, and sweet vernal, and occasional black wattle, radiata pine, woolly nightshade, mingimingi and turutu. The maritime pines may have been planted. Within and around this area there are small patches of pampas-ginger scrub (m) and sweet vernal grassland (n). The latter is typically dominant throughout the site where semi-consolidated sand has been cleared for infrequently used vehicle tracks. There are also bare sand tracks which are frequently used by vehicles and there are also large bare sand blow-outs in several locations caused by vehicle disturbance and/or natural sand movement.

To the north of Ruakaka Racecourse, and also in a few other dune slacks where soils have higher moisture year round, there is harakeke-gorse flaxland (q). The only areas of open water (s) present within this site are the constructed ponds at Semenoff Sand Supplied Ltd on State Highway 1. These are included as habitat because they have been used by threatened bird species in the past, and at times have supported reedland vegetation on their margins, however this is no longer present (John Kendrick pers. comm.).

Significant flora

Kunzea ericoides var. *linearis* (Serious Decline), *Pimelea arenaria* (Gradual Decline) (very rare at this site—Lisa Forester, NRC, pers. comm.), pingao (Gradual Decline), and *Coprosma acerosa* (regionally significant).

Fauna

Australasian bittern (Nationally Endangered) were recorded at Semenoff Sand Supplies Ltd ponds in 1999 (SSBI Q07/H110), and New Zealand dabchick (Sparse) were recorded from the same locality in 2004 (Amokura 93, 2004) and in 2007 (Ray Pierce pers. comm.). Australasian little grebe (regionally significant) have also been found here occasionally since the 1990s (Richard Parrish pers. comm.). The sandy margins of these ponds have been used as a northern NZ dotterel (Nationally Vulnerable) breeding site in the recent past, however frequent disturbance and vegetation clearance appears to have deterred them (John Kendrick pers. comm.). Northern NZ dotterel and variable oystercatcher (regionally significant) breed at the Ruakaka Wildlife Refuge (Hansen 2005). The refuge is also considered to be the sixth most important wintering site for variable oystercatcher in the country (Dowding and Moore 2006). One of the densest populations of black katipo (Serious Decline) in Eastern Northland occurs along this coast (Griffiths 2000). Auckland green gecko (Gradual Decline) and shore skink were recorded in 1992 (SSBI Q07/H110). Individual green and loggerhead sea turtles, both alive and dead, wash up on the beach from time to time (DOC Bioweb 2007). One leopard seal (Migrant) was seen on the spit off Marsden Point, Whangarei Harbour in the early 1990s (Richard Parrish pers. comm.). Occasionally, northern blue penguins (Gradual Decline) from the Motukaroro Island (Whangarei Harbour) breeding site wash up on to Bream Bay beaches exhausted and starving (Richard Parrish pers. comm.). Individual red-tailed tropicbirds (Range Restricted), also known as amokura, occasionally appear beach-wrecked along Bream Bay (Richard Parrish pers. comm., John Kendrick pers.

comm.). A white-tailed tropicbird was also found once in the late 1990s/early 2000s (Richard Parrish pers. comm.).

Significance

This site has the largest continuous stretch of duneland habitats in Waipu ED. It has eight representative ecological units: (b) sandfield habitat on beach and sand dune, (c) pohuehue shrubland on sand dune, (e) kanuka forest on sand dune, (l) pohuehue-*Coprosma acerosa* shrubland on sand dune, (o) knobby clubbrush-pohuehue sedgeland on sand dune, (q) harakeke-gorse flaxland on sand dune, (r) glasswort herbfield in estuary, and (i) spinifex grassland on sand dune. The site supports populations of two threatened plant species (*Kunzea ericoides* var. *linearis* and pingao) and one regionally significant plant species (*Coprosma acerosa*). It provides habitat for five threatened fauna species (Australasian bittern, NZ dabchick, northern NZ dotterel, black katipo, and Auckland green gecko), and northern blue penguins (Gradual Decline) also wash up but are not using the site as habitat. Two regionally significant fauna species are present (variable oystercatcher and Australasian little grebe); and the former is known to breed here. No natural freshwater wetlands remain, but wildlife use the constructed ponds within this site (e.g. Semenoff Sand Supplies Ltd ponds). This site forms a protective buffer between the sea and land and acts as an important wildlife corridor. It is near to, or linked with, several coastal wetlands e.g. McEwan Road Wetland (Q07/131), Sime Road Wetland (Q07/141), Doctor's Hill Road Wetland (Q07/127), and Ruakaka River Estuary (Q07/130), but it is relatively isolated from large forested areas. The Ruakaka coast has high visitor use, and a very high level of disturbance from people and pets (e.g. dogs and cats), which impacts negatively on nesting shorebirds. Temporary fencing is used to protect the main breeding areas for northern NZ dotterels and variable oystercatchers. The campground on the southern side of the Ruakaka River estuary has c. 10,000 visitors over the summer holiday period (Hansen 2005). Approximately 80% or 579 ha of this site is under some form of legal protection, as follows: 411.6 ha of stewardship land (Ruakaka Conservation Area, DOC-administered); 73.4 ha of government purpose reserve (Waipu Government Purpose Wildlife Refuge, DOC-administered); 62.3 ha of recreation reserve (Uretiti Recreation Reserve, DOC-administered); 17.3 ha of marginal strip (Ruakaka Beach Marginal Strip Nos 1 and 2, DOC-administered); 13.6 ha of wildlife refuge (Ruakaka Wildlife Refuge, DOC-administered); 0.3 ha of crown-owned seabed (DOC-administered); and 0.4 ha of esplanade reserve (WDC).

RUAKAKA RACECOURSE DUNE LAKE

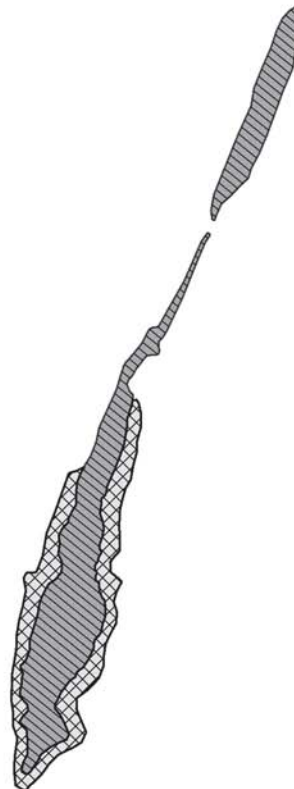
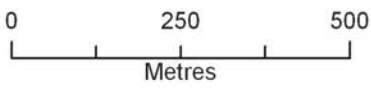
Survey no.	Q07/129
Survey date	9 November 2006
Grid reference	Q07 422891 (2 remnants)
Area	4.0 ha (1.3 ha shrubland, 2.7 ha wetland)
Altitude	sea level

Ecological units

- (a) Open water (dune lake) (65%)
- (b) Gorse scrub on sand dune (25%)
- (c) Raupo-alligator weed reedland on dune lake margin (4%)



Q07/129 Ruakaka Racecourse Dune Lake



- (d) Ti kouka treeland on dune lake margin (3%)
- (e) Raupo reedland on dune lake margin (2%)
- (f) Lake clubrush-alligator weed reedland on dune lake margin (1%)

Landform/geology

Lake in interdune hollow on Holocene coastal dunefield.

Vegetation

The Ruakaka Racecourse Dune Lake is situated in an approximately north-south oriented interdune hollow behind the foredune which forms the northern side of the Ruakaka River mouth. The lake is the northern end of an impounded watercourse and there are several small ponds to the south shaded by acacias (not included in the site). The estuarine waters of the river curve around behind the dune lake, but do not inundate it, thus the lake is essentially freshwater, probably rain-fed. Much of the foredune to the east of the lake has been occupied by the racecourse and associated buildings and horse paddocks, and the western side (on sand dunes between the lake and the river) is also used for horse grazing. On a short section of the northwestern side horses graze up the edge of the lake, otherwise it is protected by a buffer of exotic scrub. The narrow northern extension of the lake is currently being substantially modified by heavy equipment employed to flatten dunes and increase land area for a major residential development being undertaken. This northern extension would once have been integral to the wetland margin of the lake. An unsealed road runs past the southern end of the lake, and a small pond with exotic vegetation has formed or been constructed on the southern side of this road (not included in the site).

The lake is very shallow (less than 2 m) and the habitat is mostly open water (a) with several emergent reedland types around the margins such as raupo-alligator weed reedland (c), raupo reedland (e), and lake clubrush-alligator weed reedland (f). *Baumea articulata*, *Juncus pallidus* and *Azolla pinnata* are scattered around the lake margins within these reedlands. On the eastern side there is a small area of wetland forest dominated by ti kouka in which gorse is frequent and manuka, arum lily, ginger, pampas, harakeke, ngaio,* and brush wattle are occasional. The lake is bordered by a narrow strip of gorse shrubland (b) within land administered by DOC, or otherwise by grazed or rank grassland. Other species within the shrubland include frequent brush wattle and bracken, and occasional crack willow, kanuka, taupata, lupin, blackberry, and woolly nightshade. Reed sweetgrass was noted at the southern lake margin in 1998 (SSBI Q07/H049), but was not found during the current survey.

Significant flora

Arrow grass (regionally significant) (AK 298334).

Fauna

During a recent survey (19/02/2007) the following species were observed on the lake: 4-5 each of black shag (Sparse), little black shag and little shag, three white-fronted tern (Gradual Decline), 10 grey duck (Nationally Endangered), three Australasian shoveler (regionally significant), one spotless crane (Sparse) and one banded rail (Sparse) (Ray Pierce pers. comm.). In addition, a single NZ scaup (regionally significant) was observed on 6/03/2007 (Ray Pierce pers. comm.).

Australasian bittern (Nationally Endangered) have been reported by a local resident, and in 1998, red-billed gull (Gradual Decline) were recorded here (SSBI Q07/H049). Australasian little grebe (Coloniser; regionally significant) have also been noted (Peter Anderson, DOC, pers. comm. 2006). Other non-threatened species such as white-faced heron, Australasian harrier, pukeko, black-backed gull, welcome swallow, shining cuckoo, paradise shelduck, pied shag and NZ pipit have been recorded here from 1980 to recently (SSBI Q07/H049; current study).

* The ngaio is probably planted.

Significance

This is the only dune lake in Waipu ED and the only dune lake recorded in the whole Eastern Northland Ecological Region, therefore it is a site of very high ecological significance. It is one of only five natural coastal freshwater wetlands remaining in Waipu ED (Q07/131, Q07/141, Q07/127, Q07/129 and R08/001). Most natural freshwater wetlands which were present in the ED in the past have been drained or modified, so that now there are only approximately 45 ha of natural or semi-natural wetland remaining (in total, across both inland and coastal zones). There are no natural dune lakes between this site and the Karikari Peninsula to the north and the Tomarata dune lakes to the south. Although most Northland dune lakes are of national significance, this site is considered to be of regional significance due to small size, level of modification and compromised biodiversity values (Wendy Holland pers. comm.). Despite this, there are seven threatened fauna species (Australasian bittern, spotless crake, banded rail, red-billed gull, grey duck, white-fronted tern, and black shag) and three regionally significant fauna species (Australasian little grebe, Australasian shoveler, and NZ scaup) recorded from here, and there is a new record of a regionally significant plant species (arrow grass). Apart from (b) gorse scrub, all of the ecological units are representative of their types (because they do not occur elsewhere in the ED. The southern part of the main lake (2.83 ha) is in the Ruakaka Conservation Area (DOC-administered) but the northern end and the smaller northern extension, are unprotected and are both open to grazing and land development pressures which could negatively affect the entire lake.

RUAKAKA RIVER ESTUARY

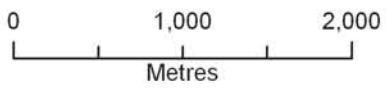
Survey no.	Q07/130
Survey date	15 November 2006
Grid reference	Q07 420881 (5 remnants)
Area	87.2 ha (81.3 ha estuary, 6.0 ha forest)
Altitude	0–18 m asl

Ecological units







- (a) Mudflat and sandflat in estuary (65%)
- (b) Estuarine open water (15%)
- (c) Mangrove shrubland and forest in estuary (7%)
- (d) Totara-pohutukawa forest on steep hillslope (3%)
- (e) Pohutukawa forest on steep hillslope (2%)
- (f) Oioi rushland in estuary (1%)
- (g) Oioi-sea rush rushland in estuary (1%)
- (h) *Austrostipa stipoides* tussockland in estuary (1%)
- (i) Glasswort-mangrove sandfield in estuary (1%)
- (j) Glasswort herbfield in estuary (1%)
- (k) Saltmarsh ribbonwood shrubland in estuary (1%)
- (l) Manuka shrubland in estuary (1%)
- (m) Gorse scrub in estuary (1%)

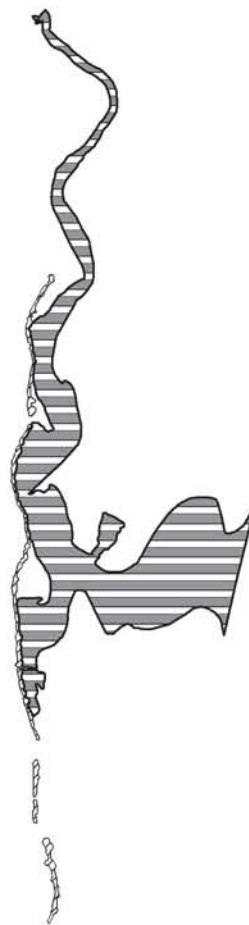


Q07/130 Ruakaka River Estuary



Habitat Type

-  Forest
-  Shrubland
-  Wetland
-  Duneland/Sandfield
-  Estuarine
-  Rockland



Landform/geology

Estuarine sandy intertidal flats and channels, backed by cliffs cut in Pleistocene consolidated dune sand.

Vegetation

The Ruakaka River Estuary begins as an 80–100 m wide meandering estuarine channel (b) heading southwards parallel to the coast between Ruakaka township to the east and sand dunes around the Ruakaka Racecourse to the west. Where the river turns out to the coast the estuary opens out into mudflats and sandflats (a) stretching to approximately 500 m wide at the river mouth. At the southern margin of the bend, a small stream joins the estuary giving rise to an additional inlet with mudflats, saltmarsh and mangroves. Low mangrove shrubland (c) is the main vegetation type around estuarine margins, but there are also tiny areas of mangroves large enough to be classified as forest, in particular around the southern stream mouth. Mosaics of low growing saltmarsh vegetation occur in and around the edges of the mangroves. Sandy channel margins often have glasswort–mangrove sandfield vegetation (i) comprising frequent glasswort mixed with frequent mangrove pneumatophores and seedlings, or these areas can have more dense mats of glasswort herbfield (j), with frequent sea primrose. On broad mudflats and sandflats there are uniform copper-coloured areas of oioi rushland (f) mixed with golden stripes of *Austrostipa stipoides* tussockland (h) which generally occur on drier, sandy ridges within the mudflats. Each of these types has scattered occurrence of all the dominant species in ecological units (f)–(i), and occasional saltmarsh ribbonwood. Saltmarsh ribbonwood shrublands (k) occur locally around the terrestrial margins. Oioi–sea rush rushland (g) is present in the major saltmarsh area on the northern side of the estuary, just inland of the mouth. At this location manuka shrubland (l) with frequent harakeke, mapou and gorse, and occasional saltmarsh ribbonwood and brush wattle grows on low raised islands. Similar small islands of terrestrial/estuarine vegetation exist on the southern side of the river estuary. These are often dominated by gorse scrub (m) and can have other invasive species such as woolly nightshade and *Acacia sophorae*. In addition to those already detailed there is a range of weedy species around the estuarine margins including many pasture weeds, coral tree, a running bamboo species, watsonia, tuber ladder fern and coastal banksia (planted).

The coastal scarp to the west of the estuary is covered in native forest which is contiguous with the estuarine vegetation at various points. The vegetation includes high-quality, mature pohutukawa forest (e) with occasional totara, houpara, karaka, kawakawa, kahakaha and *Astelia banksii*, as well as more disturbed and weed-infested totara–pohutukawa forest (d) with frequent gorse and occasional kawakawa, puriri, karamu, mahoe, mamaku, bracken, wild cherry, crack willow, woolly nightshade, brush wattle, radiata pine, and pampas. On terrestrial alluvial flats between the scarp and the estuary there is either exotic grassland or residential housing (not included in this site). The dunes to the north and south of the river mouth are both part of Ruakaka Dunelands (Q07/128).

Significant flora

There is a 1973 record of *Austrofestuca littoralis* (Gradual Decline) from the southern shore of Ruakaka River Estuary, where it grew on drifting sands with pingao (DOC Bioweb 2007). This may be the last confirmed record of this species in Waipu ED, though it has more recently been reported from the adjoining Ruakaka Dunelands (Q07/128) (Lisa Forester, NRC, pers. comm.). Pingao (Gradual Decline)

still remains in small amounts on the fringes of the estuary. Arrow grass (regionally significant) was recorded in 1992 (SSBI Q07/H051).

Fauna

A moderately diverse range of coastal and estuarine bird species use the Ruakaka River Estuary and adjacent coastline. Wildland Consultants (2004a) recorded eleven threatened or rare species, two Arctic migrant species, two regionally significant species, and fourteen common indigenous species, as follows: Australasian bittern (Nationally Endangered), Caspian tern (Nationally Vulnerable), wrybill (Nationally Vulnerable), reef heron (Nationally Vulnerable), northern NZ dotterel (Nationally Vulnerable), banded dotterel (Gradual Decline), red-billed gull (Gradual Decline), white-fronted tern (Gradual Decline), black shag (Sparse), banded rail (Sparse), spotless crake (Sparse), bar-tailed godwit (Migrant), lesser knot (Migrant), grey teal (regionally significant), variable oystercatcher (regionally significant), pied oystercatcher, little shag, pied shag, Australasian gannet, Australasian harrier, pied stilt, spur-winged plover, NZ pipit, NZ kingfisher, black-backed gull, welcome swallow, silvereeye, grey warbler and white-faced heron. Northern NZ dotterel and variable oystercatcher are known to breed in and around the estuary (Wildland Consultants 2004a) and banded rail possibly do so also, but this is not confirmed (Ray Pierce pers. comm.). Also, at least one pair of reef herons has bred there recently (Margaret Hicks pers. comm.).

Additional to the species listed above, grey duck (Nationally Endangered) and North Island fernbird (Sparse) were recorded in 1991 (SSBI Q07/H051). Unfortunately fernbirds have not been seen again since a fire in 1992. This fire destroyed their habitat which was largely replaced by gorse (Peter Anderson, DOC, pers. comm.). Turnstone (Migrant) were recorded in 1978 (SSBI Q07/H051). NZ fairy terns (Nationally Critical) have been recorded in small numbers feeding over the water (*Amokura* 90 and 91); most recently in early 2007 (Kelly Brogtrop pers. comm.). A white heron (Nationally Critical) was recorded in 1995 (Gavin Grant in CSN *Notornis* 43). One red-necked stint (Migrant) was observed in 1980 (Richard Parrish pers. comm.) and solitary eastern curlews (Migrant) were noted in 1980 and 1993 (Richard Parrish pers. comm.; Richard Parrish in CSN *Notornis* 41). A Hudsonian godwit (Migrant) was seen in 1999 (Pauline Smith in CSN *Notornis* 47). A white-winged black tern was observed in 1998/1999 (Burt and Snell in CSN *Notornis* 47). A common sandpiper (Vagrant) was seen in 1980 (Richard Parrish pers. comm.). Shore skinks were found here in 2006 (Peter Anderson, DOC, pers. comm.).

Ruakaka River Estuary supports abundant macroinvertebrates, particularly bivalve molluscs such as cockle, pipi, nutshell, *Macomona liliana*, *Cyclomactra ovata*, *Dosinea subrosea*, NZ rock oyster and Pacific oyster (exotic), and gastropods such as mudsnail, *Cominella glandiformis*, *Zediloma subrostrata* and *Zeacumantus lutulentus*. There is also a variety of barnacle, crab and shrimp species, and populations of polychaete worm species which are consumed by waders such as bar-tailed godwit and northern NZ dotterel (Wildland Consultants 2004a).

Black katipo (Serious Decline) have been recorded in this site. These are part of one of the densest populations in eastern Northland, which extends the length of the Ruakaka Dunelands (Q07/128) to the north and south of this estuary (Griffiths 2000).

Significance

Ruakaka River Estuary supports a wide variety of fauna species and is a particularly important habitat for threatened bird species within the northern coastal dune

systems of Waipu ED. The estuary supports at least twelve threatened bird species (NZ fairy tern, Australasian bittern, Caspian tern, wrybill, reef heron, northern NZ dotterel, banded dotterel, red-billed gull, white-fronted tern, black shag, banded rail, spotless crane) of which three species breed in the area (NZ dotterel, variable oystercatcher, and reef heron). Grey duck and NI fernbird may also be present. There are also two regionally significant bird species (variable oystercatcher and grey teal), one of which breeds here (variable oystercatcher). Habitat for the threatened black katipo spider is present. The Ruakaka coast has high visitor use, and a very high level of disturbance from people and pets (e.g. dogs and cats), which impacts negatively on nesting shorebirds. Temporary fencing is used to protect the main breeding areas for northern NZ dotterels and variable oystercatchers. The campground on the southern side of the Ruakaka River estuary has c.10,000 visitors over the summer holiday period (Hansen 2005). The estuary has 11 representative ecological units (this includes all units except (d) totara-pohutukawa forest and (m) gorse scrub, as these both have a high component of exotic species). Two threatened plant species (*Austrofestuca littoralis* and pingao) and one regionally significant plant species (arrow grass) have been recorded here. 86% (74.7 ha) of the site has some form of legal protection, as follows: 50.1 ha of wildlife refuge (Ruakaka Wildlife Refuge, DOC-administered); 22.8 ha of stewardship land (Ruakaka Conservation Area, DOC-administered); 0.5 ha of recreation reserve (Ruakaka Domain Recreation Reserve, DOC-administered); 0.2 ha of marginal strip (Ruakaka River Marginal Strip No. 2, DOC-administered), 0.2 ha esplanade reserve (WDC-administered), and 0.9 ha of wildlife refuge (WDC-administered).

McEWAN ROAD WETLAND

Survey no.	Q07/131
Survey date	11 November 2006
Grid reference	Q07 429926
Area	0.7 ha
Altitude	6 m asl

Ecological units

- (a) *Azolla filiculoides*-burr reed herbfield in small dune slack (36%)
- (b) Manuka shrubland in small dune slack (35%)
- (c) *Eleocharis sphacelata* reedland in small dune slack (20%)
- (d) *Azolla filiculoides* herbfield in small dune slack (5%)
- (e) Soft rush-*Azolla filiculoides* rushland in small dune slack (2%)
- (f) *Eleocharis acuta*-*Azolla filiculoides* sedgeland in small dune slack (1%)
- (g) Yorkshire fog grassland in small dune slack (1%)

Landform/geology

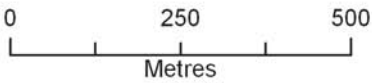
Wetland in interdune hollow in Holocene coastal dunefield.

Vegetation







The wetland at the Marsden Point Road and McEwan Road junction is a small dune slack on consolidated sand with mainly indigenous palustrine herbfield, rushland, sedgeland, and grassland vegetation around an island of manuka shrubland at centre. The site is surrounded by exotic grassland and scattered patches of gorse.

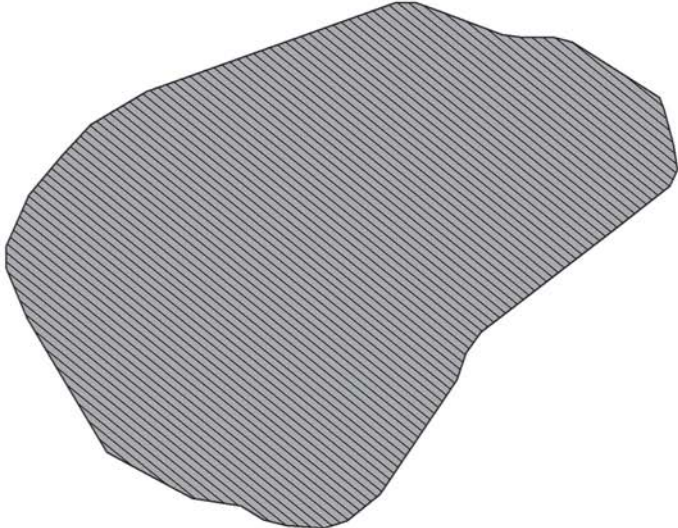


Q07/131 McEwan Road Wetland



Habitat Type

-  Forest
-  Shrubland
-  Wetland
-  Duneland/Sandfield
-  Estuarine
-  Rockland



The most extensive vegetation type is *Azolla filiculoides*-burr reed herbfield (a), which has frequent *Eleocharis acuta* and occasional *Lachnagrostis filiformis* and *paspalum*. A water fern *A. filiculoides* floats on the surface of the water, giving the wetland a deep reddish colour at certain times of the year, with emergent clumps of various sedges and grasses in different associations. *A. filiculoides* is associated with

abundant *Eleocharis acuta* in small patches (f). Around the wetland edges there are patches of *A. filiculoides* herbfield (d) with frequent kikuyu and paspalum, and occasional *Juncus pallidus*, duckweed and *Carex ovalis*, and also small areas of soft rush-*A. filiculoides* rushland (e) with frequent paspalum, *Polygonum strigosum*, *Carex ovalis*, and *Juncus articulatus*, and occasional shivery grass, *Lachnagrostis filiformis*, bachelor's button, track rush, starwort, and lotus. Deeper water supports tall, bright green stands of *Eleocharis sphacelata* reedland (c), which is emergent over *A. filiculoides*, starwort and duckweed, and occasional *Polygonum strigosum*. Slightly raised ground at the centre has manuka shrubland (b) on it, associated with frequent *Eleocharis sphacelata*, *Eleocharis acuta* and *Baumea* sp. There is also a small raised patch of ground with Yorkshire fog grassland (g).

Significant flora

Burr reed (regionally significant) (AK 297989) and *Azolla filiculoides* (regionally significant) are abundant within this site.

Fauna

Australasian bittern (Nationally Endangered) were recorded in present study and in 2004 (Wildland Consultants 2004a), and are known to be regular occupants of this wetland by local observers (John Kendrick pers. comm., Margaret Hicks pers. comm.). Pukeko were also recorded during the current site visit.

Significance

Despite its small size, McEwan Road Wetland is a unique and significant habitat, and it is one of only five natural coastal freshwater wetlands remaining in Waipu ED (Q07/131, Q07/141, Q07/127, Q07/129 and R08/001). Freshwater wetlands have been greatly reduced in extent throughout New Zealand, and only approximately 45 ha of natural or semi-natural wetland remains in Waipu ED. This site has fairly large populations of two regionally significant plant species (burr reed and *Azolla filiculoides*), and it provides habitat for the Nationally Endangered Australasian bittern. This site has five representative ecological units: (f) *Eleocharis acuta*-*Azolla filiculoides* sedgeland in small dune slack, (d) *Azolla filiculoides* herbfield in small dune slack, (c) *Eleocharis sphacelata* reedland in small dune slack, (b) manuka shrubland in small dune slack, and (a) *Azolla filiculoides*-burr reed herbfield in small dune slack. Units (a), (d) and (f) have not been recorded elsewhere in the ED. This site is isolated from other similar habitats by pasture, roads and industrial areas, however it is probably part of a wider network of wetland bird habitat remnants which includes other natural and constructed freshwater wetlands and estuarine wetlands in the northern half of Waipu ED.

WAIPU CAVES ROAD SANDSTONE KNOLL

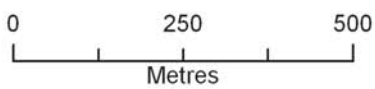
Survey no.	Q07/132
Survey date	11 November 2006
Grid reference	Q07 308866
Area	2.4 ha (1.8 ha forest, 0.5 ha rockland)
Altitude	216-245 m asl

Ecological units







- (a) Taraire forest on ridge (90%)
- (b) Rockland on cliff (10%)

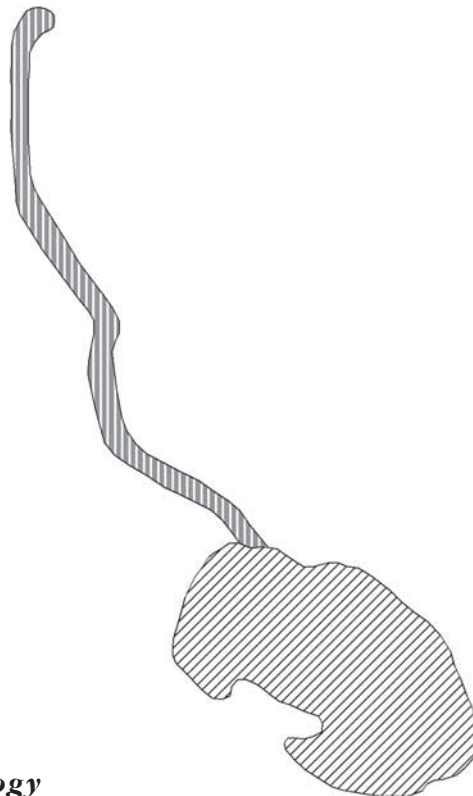


Q07/132 Waipu Caves Road Sandstone Knoll



Habitat Type

-  Forest
-  Shrubland
-  Wetland
-  Duneland/Sandfield
-  Estuarine
-  Rockland



Landform/geology

Knoll of Miocene bluff-forming sandstone (Waitemata Group).

Vegetation

This site comprises a very small area of taraire forest (a) and rockland habitat (b) on a high point to the west of the Waipu Caves Road-Springfield Road-Mangapai Caves

Road intersection. The site is surrounded by grazed pasture and appears to be heavily grazed itself. The forest association comprises abundant taraire with frequent nikau and totara and occasional examples of karaka, mapou, karamu, tawa, pate, hangehange, and *Gabunia lacera*. The rockland cliffs support scattered *Astelia solandri*, hangehange, mapou, *Metrosideros perforata*, *Metrosideros fulgens*, carmine rata, Japanese honeysuckle, Mexican daisy, foxglove, hound's tongue fern, koromiko, and *Muehlenbeckia australis*.

Significant flora

A large, mature plant of carmine rata (regionally significant) was recorded growing on a sandstone cliff near the road intersection during this survey. *Hebe macrocarpa* var. *macrocarpa* (regionally significant) was collected from a sandstone cliff below the taraire forest (AK 298337) during this survey.

Fauna

Not surveyed.

Significance

This is a very small site which is significant for the presence of two regionally significant plant species (carmine rata and *Hebe macrocarpa* var. *macrocarpa*), and because it is a distinctive landform. The rockland habitat on sandstone cliffs (b) is representative of its type in the ED. The forest is in poor condition due to grazing and trampling by stock, however the cliff habitat probably provides a refuge for the aforementioned plant species which are both very palatable.

ORMISTON ROAD FOREST AND SHRUBLAND

Survey no.	Q07/135
Survey date	10 November 2006
Grid reference	Q07 355854 (3 remnants)
Area	31.7 ha (29.7 ha forest, 1.9 ha shrubland)
Altitude	60-215 m asl

Ecological units

- (a) Totara forest on steep hillslope (50%)
- (b) Totara-kanuka forest on steep hillslope (30%)
- (c) Kauri-rimu forest on ridge (10%)
- (d) Totara treeland on steep hillslope (5%)
- (e) Manuka-kanuka shrubland on steep hillslope (5%)

Landform/geology

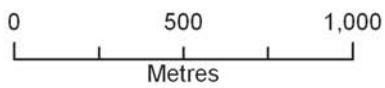
Hillslopes and gullies underlain by Mesozoic greywacke (Waipapa Terrane) in the two eastern remnants, and by Miocene sandy mudstone and bluff-forming sandstone (Waitemata Group) in the western remnant.

Vegetation







This site comprises three separate indigenous forest remnants in the vicinity of Ormiston Road, which are part of a linkage between Ruakaka Forest (Q07/121), Waipu Caves Forest (Q07/118) and Caves Road Forest (Q07/120). The surrounding landscape is pasture with scattered totara. Vegetation within this site is less diverse than nearby larger forest remnants.

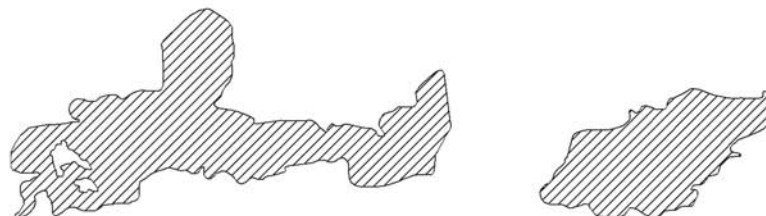
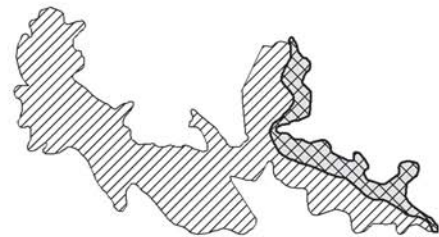


Q07/135 Ormiston Road Forest and Shrubland



Habitat Type

-  Forest
-  Shrubland
-  Wetland
-  Duneland/Sandfield
-  Estuarine
-  Rockland



Totara forest (a) with frequent kauri and occasional ponga, mamaku, lancewood, rewarewa, kahikatea and ti kouka covers c. 50% of the site, and represents the least disturbed type of totara-dominant vegetation within the site. Totara-kanuka forest

(b) represents a more disturbed forest type and is present mainly in the southwestern remnants. Other species include frequent mamaku and towai, and occasional kahikatea and rewarewa. Totara treeland (d) on the western edge represents the most disturbed forest type. There are small areas of manuka-kanuka shrubland (e) with occasional mamaku on the northern edge of the northern remnant. A prominent hilltop within the southwestern remnant supports an impressive stand of kauri-rimu forest (c) with frequent kanuka and kahikatea.

Fauna

Kukupa (Gradual Decline), tui, silvereye, and NZ kingfisher are present (Ian Fox pers. comm.)

Significance

The small but distinctive area of (c) kauri-rimu forest on ridge is a representative ecological unit for Waipu ED, however all the other ecological units in this site are better represented in other sites in the ED. Several bird species use this site, including one threatened species (kukupa). These remnants are widely spaced. Their main value is as habitat stepping stones between much larger forested areas nearby, principally Ruakaka Forest (Q07/121), Waipu Caves Forest (Q07/118) and Caves Road Forest (Q07/120). According to a local landowner, possums are regularly poisoned and shot in the northernmost remnant and are far less abundant than three years ago. Feral cats, weasels, cattle, and goats are present (Ian Fox pers. comm.).

McDONNELL ROAD FOREST AND SHRUBLAND

Survey no.	Q07/137
Survey date	13 November 2006
Grid reference	Q07 291899 (2 remnants)
Area	3.4 ha (3.3 ha forest, 0.1 ha shrubland)
Altitude	120 m asl

Ecological units

- (a) Kanuka forest on gentle hillslope (95%)
- (b) Bracken-tangle fern fernland on gentle hillslope (5%)

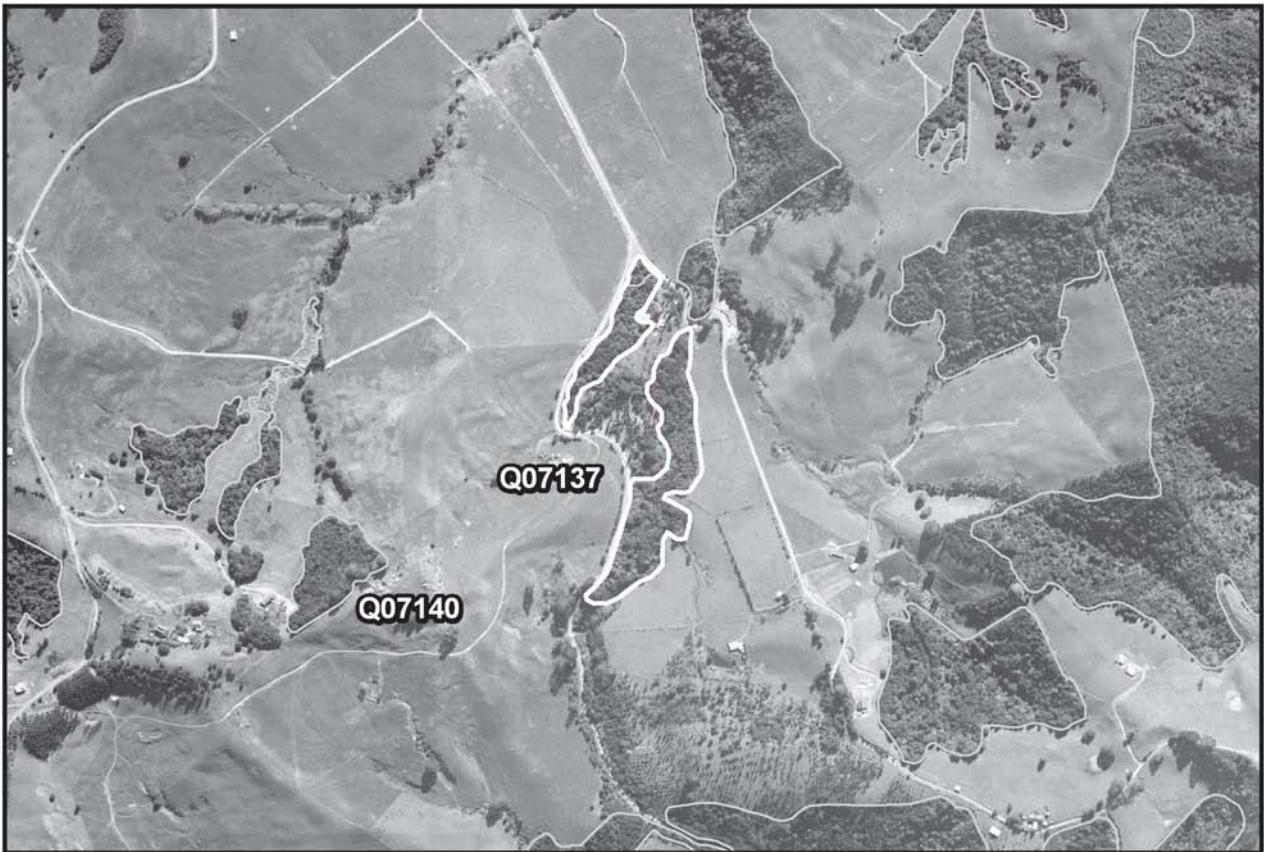
Landform/geology

Hillslope underlain by Miocene sandy mudstone (Waitemata Group).

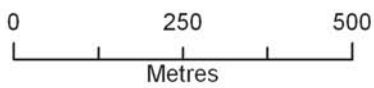
Vegetation

This site comprises two small remnants of indigenous forest and shrubland. The western edge of the site is bordered by Mangapai Caves Road and the eastern edge by grazed pasture. The remnants are approximately 300 m from the extensive Mangapai Caves Road forest remnant.







- (a) There is a small area of shrubland on the northern edge of the site adjacent to the intersection of McDonnell Road and Mangapai Caves Road. Bracken and tangle fern are common, with frequent kiokio, kohuhu, towai, mingimingi, manuka, and kanuka, and occasional ponga, wheki, mapou, shining karamu, *Dracophyllum lessonianum*, hangehange, turutu, harakeke, and *Schoenus tendo*.
- (b) The majority of the site is secondary forest dominated by kanuka. Towai is frequent and there are occasional kauri, totara, tanekaha, makamaka, lancewood, rimu, mingimingi, mahoe, ti kouka, and *Schoenus tendo*.

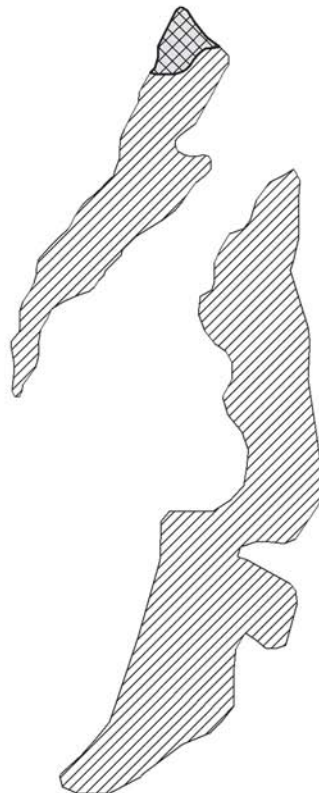


Q07/137 McDonnell Road Forest and Shrubland



Habitat Type

-  Forest
-  Shrubland
-  Wetland
-  Duneland/Sandfield
-  Estuarine
-  Rockland



Fauna

Kauri snail (Gradual Decline), North Island fantail, silvereye, and welcome swallow were recorded in this survey. Kukupa (Gradual Decline) and morepork were reported by the landowner.

Significance

The bracken-tangle fern fernland within this remnant is the only known example of its type in Waipu ED and is therefore a representative ecological unit. The remnant is fenced to exclude stock and weed infestation is minimal. The remnant provides riparian protection for a tributary of the Tauraroa River, and provides a linkage between the Mangapai Caves Road and Pokapu Hill remnants. Two threatened fauna species (kukupa and kauri snail) are present.

UPPER MANGAWAI RIVER WETLANDS

Survey no.	Q07/138
Survey date	12 November 2006
Grid reference	Q07 263801 (2 remnants)
Area	6.8 ha
Altitude	40–43 m asl

Ecological units

- (a) Harakeke flaxland in gully (50%)
- (b) Kahikatea-harakeke treeland in gully (25%)
- (c) Reed sweetgrass grassland in gully (25%)

Landform/geology

Valley floor wetland on Holocene alluvium.

Vegetation

This site comprises two remnant patches of palustrine/riverine wetland in the broad, flat gullies of two tributaries to the Mangawai River, located near the Papanui-Oakleigh Road-Cassidy Road intersection. The western patch lies outside Waipu ED boundary (in Tokatoka ED), however it has not been previously surveyed as part of the PNA programme, and is naturally linked with the patch inside the ED boundary.

Harakeke flaxland (a) with frequent emergent ti kouka and *Coprosma propinqua* var. *propinqua*, and frequent vines of Japanese honeysuckle constitutes the main vegetation type in both patches. There are occasional emergent kahikatea, manatu, pukatea, kowhai, mamaku, and crack willow, and at lower levels there are occasional pampas, creeping buttercup, and karamu. In the western patch, young kahikatea forms an emergent treeland over the top of the flaxland (b), with similar associated species. Grazed areas of the wetland support reed sweetgrass grassland (c) with occasional kahikatea, ti kouka, manuka, *Coprosma propinqua* var. *propinqua*, and harakeke.

Significant flora

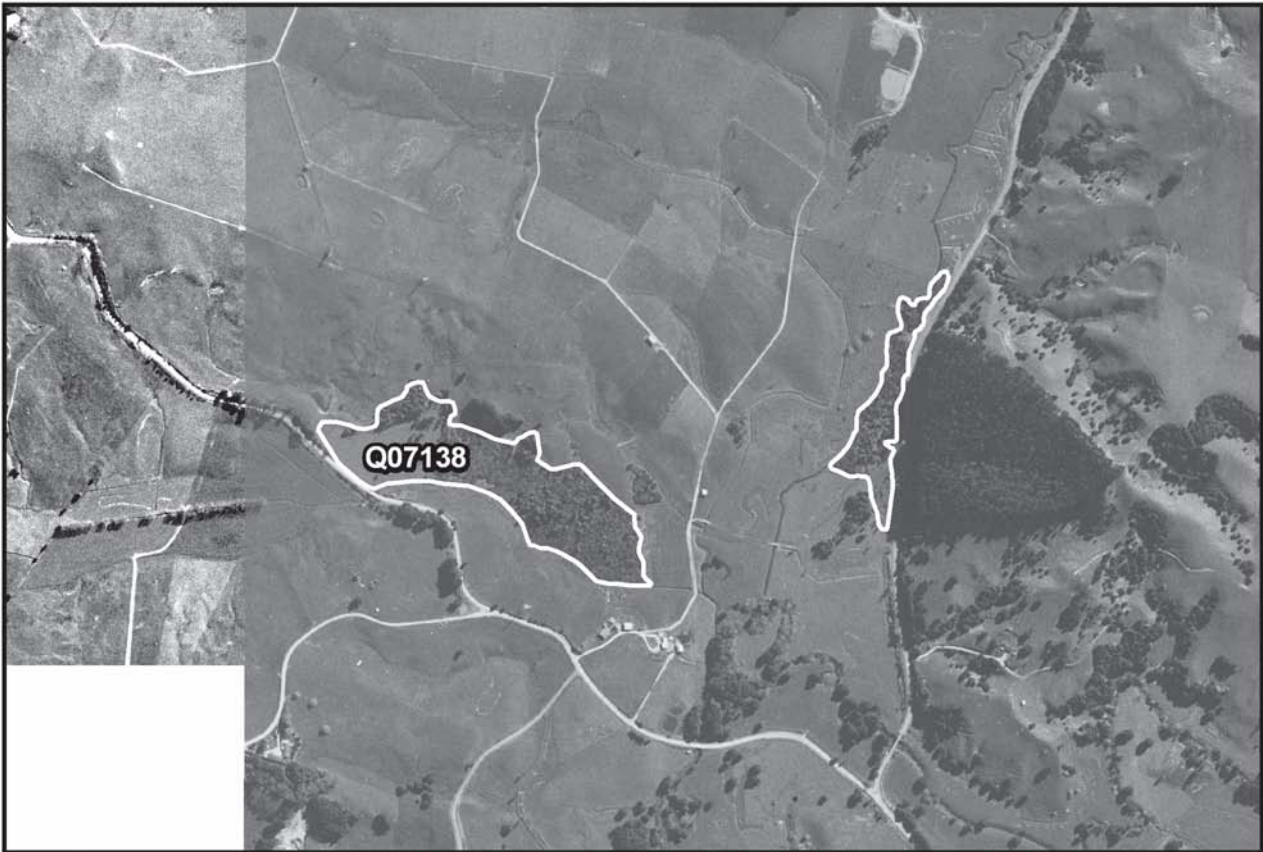
Manatu (regionally significant).

Fauna

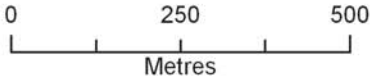
Grey warbler and tui were recorded in the current survey.





Significance

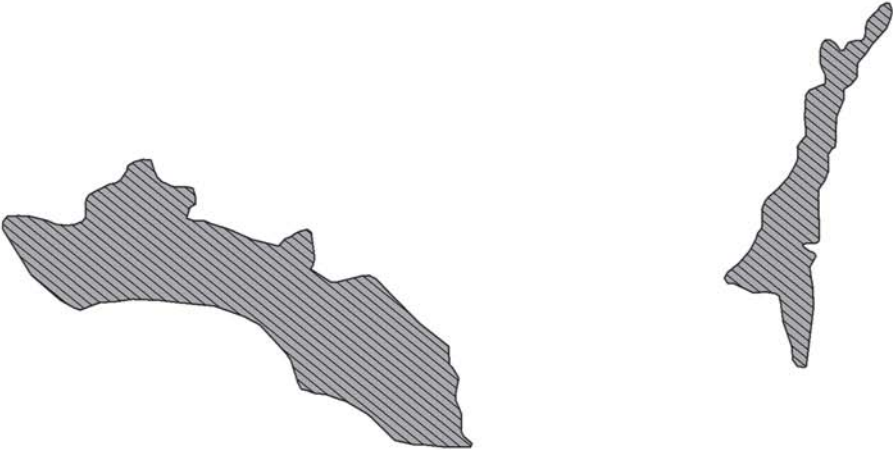
This site contains representative, although relatively degraded, examples of (a) harakeke flaxland and (b) kahikatea-harakeke treeland in a gully wetland system. In terms of area it is the second largest natural freshwater wetland in Waipu ED.



Q07/138 Upper Mangawai River Wetlands



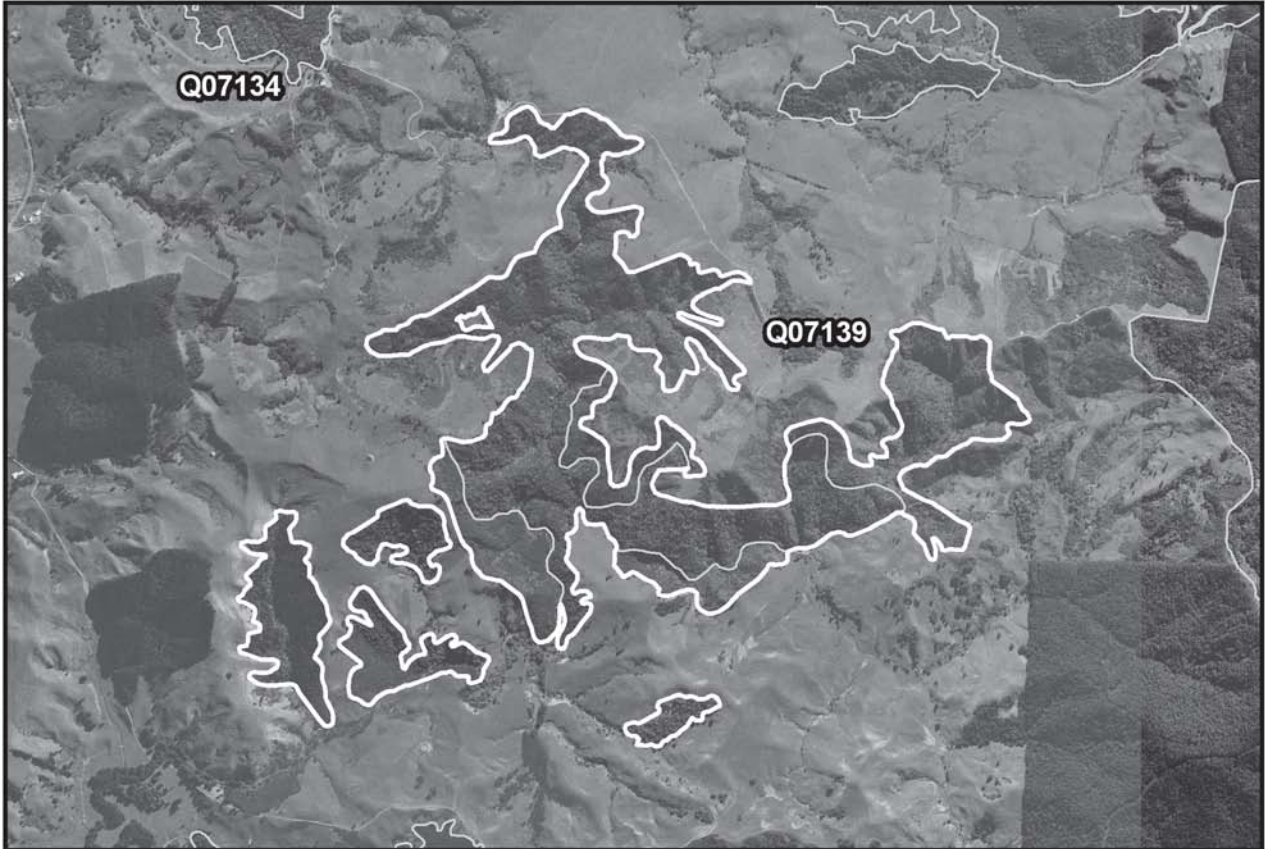
- Habitat Type
-  Forest
 -  Shrubland
 -  Wetland
 -  Duneland/Sandfield
 -  Estuarine
 -  Rockland



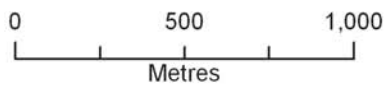
Freshwater wetlands have been greatly reduced in extent throughout New Zealand, and only approximately 45 ha of natural or semi-natural wetland remains in Waipu ED. Manatu, a regionally significant plant species, is present at low abundance.

EASTERN MANGAWAI CATCHMENT REMNANTS







Survey no. Q07/139
Survey date 12 November 2006
Grid reference Q07 291812 (5 remnants)
Area 117.6 ha (84.0 ha forest, 33.6 ha shrubland)
Altitude 60-200 m asl



Q07/139 Eastern Mangawai Catchment Remnants



Habitat Type

-  Forest
-  Shrubland
-  Wetland
-  Duneland/Sandfield
-  Estuarine
-  Rockland



Ecological units

- (a) Totara-kahikatea-taraire forest on steep hillslope and in gully (50%)
- (b) Kanuka shrubland on steep hillslope and ridge (20%)
- (c) Totara forest on steep hillslope (10%)
- (d) Manuka-gorse-kanuka shrubland on moderate hillslope (10%)
- (e) Totara-kanuka shrubland on steep hillslope (10%)

Landform/geology

Steep hillslopes and gullies underlain by Mesozoic greywacke (Waipapa Terrane).

Vegetation

This site comprises a series of generally south-facing, semi-forested gullies and steep hillslopes in the upper eastern Mangawai catchment. The forest remnants are linked by areas of mixed indigenous-exotic shrubland. Gorse scrub and pasture surround the site. Two thirds of the site was able to be viewed and described from public roads; the rest of the vegetation types and percentages were estimated using aerial photography flown in July 2002.

Totara-kahikatea-taraire forest (a) clothes steep hillslopes, gullies and gully heads. Mamaku, kohekohe and puriri are frequent associates, while tawa, rewarewa, nikau, and ponga were recorded as occasional. There are also small stands of less diverse totara forest (c) with occasional kahikatea and rewarewa. Kanuka shrubland (b) with frequent mamaku and gorse, and occasional young totara, is the most common shrubland type on ridges and hillslopes between the forest remnants. Less common shrubland types include manuka-gorse-kanuka shrubland (d) and totara-kanuka shrubland (e), each of which also have frequent mamaku.

The site does not appear to be fenced, but is probably not heavily grazed, as evidenced by the strong regeneration of indigenous shrubland and gorse scrub.

Fauna

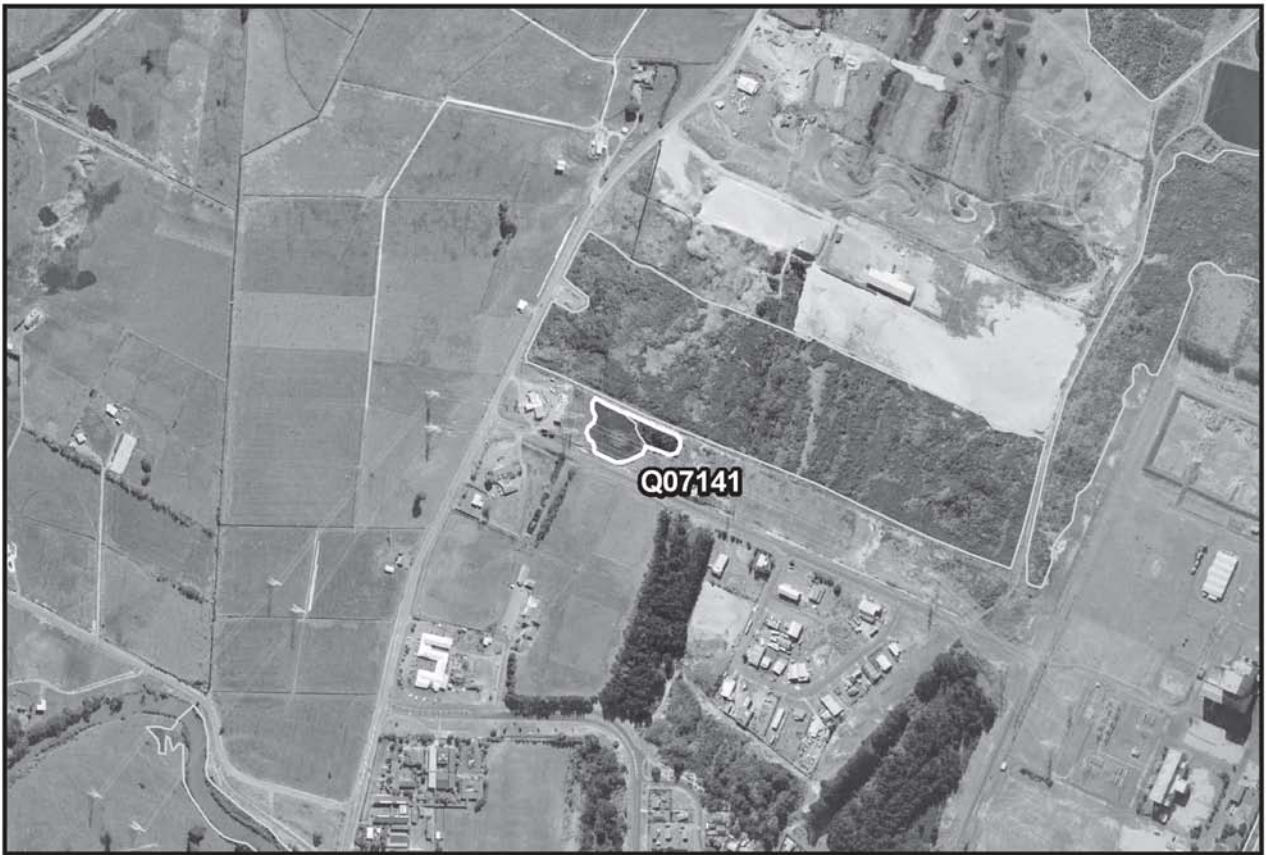
Australasian harrier.

Significance

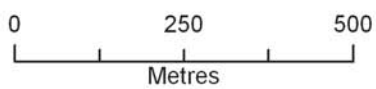
These remnants include some of the largest regenerating shrubland areas in Waipu ED, which can provide important habitat for species such as kiwi and lizard (e.g. Auckland green gecko). They are also important as habitat stepping stones for birds in a landscape which is otherwise mostly pasture (western Waipu ED). This site contains representative examples of two ecological units: (a) totara-kahikatea-taraire forest on steep hillslope and in gully, and (e) totara-kanuka shrubland on steep hillslope. It also provides some protection from erosion in the Mangawai Stream catchment.

SIME ROAD WETLAND

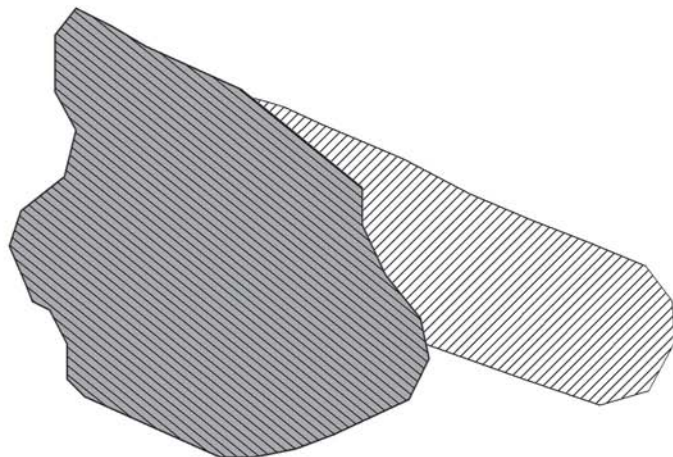
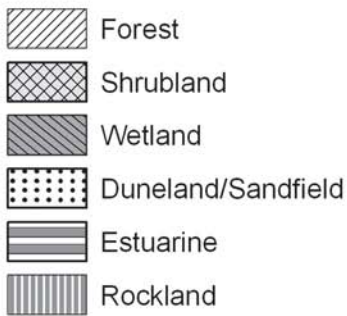
Survey no.	Q07/141
Survey date	13 November 2006
Grid reference	Q07 424912
Area	0.7 ha (0.2 ha forest, 0.5 ha wetland)
Altitude	8-10 m asl



Q07/141 Sime Road Wetland



Habitat Type



Ecological units

- (a) *Eleocharis sphacelata* reedland in small dune slack (50%)
- (b) Kanuka forest on sand dune (25%)
- (c) *Baumea articulata* reedland in small dune slack (20%)
- (d) *Baumea teretifolia* sedgeland in small dune slack (3%)
- (e) *Carex ovalis* sedgeland in small dune slack (1%)
- (f) Raupo reedland in small dune slack (1%)

Landform/geology

Wetland in hollow behind Holocene coastal dunefield.

Vegetation

Behind industrial buildings at the intersection of Sime Road and Marsden Point Road there is a small dune slack with indigenous wetland vegetation. It comprises a mosaic of *Eleocharis sphacelata* reedland (a) and *Baumea articulata* reedland (c) with small patches of *Baumea teretifolia* sedgeland (d), *Carex ovalis* sedgeland (e), and raupo reedland (f). On the eastern margin there is a very small area of kanuka forest with frequent manuka and occasional mamaku (b). Immediately surrounding the wetland there is Yorkshire fog-sweet vernal grassland, and further away to the north, there are extensive gorse-pampas shrublands within the Ruakaka Dunelands (Q07/128).

Fauna

Australasian bittern (Nationally Endangered) heard calling from wetland during this survey. A spotless crake tape was played, with no response. Welcome swallow present.

Significance

Despite its small size, Sime Road Wetland is a unique and significant habitat, as it is one of only five natural coastal freshwater wetlands remaining in Waipu ED (Q07/131, Q07/141, Q07/127, Q07/129 and R08/001). Freshwater wetlands have been greatly reduced in extent throughout New Zealand, and only approximately 45 ha of natural or semi-natural wetland remains in Waipu ED. There are three representative ecological units in this site: (a) *Eleocharis sphacelata* reedland in small dune slack, (c) *Baumea articulata* reedland in small dune slack, and (d) *Baumea teretifolia* sedgeland in small dune slack. The Nationally Endangered Australasian bittern uses this small wetland. Although it is isolated from other similar habitats by pasture, roads and industrial areas, it is probably part of a wetland bird habitat network which includes other natural and constructed freshwater wetlands and estuarine wetlands in the northern half of Waipu ED.

TAKAHIWAI STREAM ESTUARY

Survey no.	Q07/143
Survey date	16 November 2006
Grid reference	Q07 391950 (3 remnants)
Area	11.1 ha (9.1 ha estuary, 2.0 ha shrubland)
Altitude	0-2 m asl

Ecological units

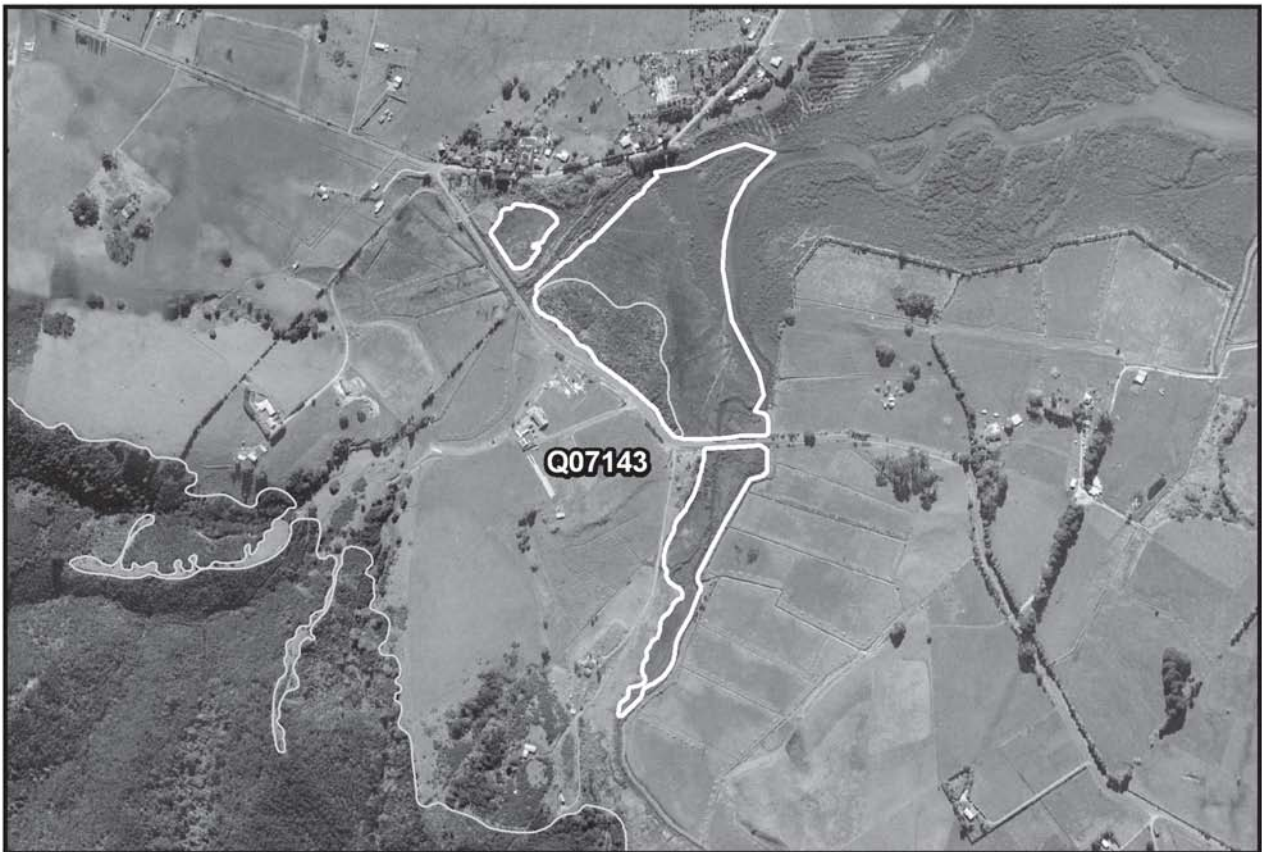
- (a) Sea rush-oioi rushland in estuary (50%)
- (b) Mangrove shrubland in estuary (25%)
- (c) Manuka shrubland on alluvium (25%)

Landform/geology

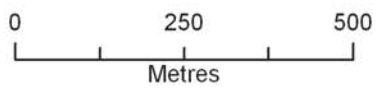
Muddy intertidal flats and channels at head of estuary.

Vegetation







This site is adjacent to the lower reaches of Takahiwai Stream. The site includes a complete terrestrial to estuarine vegetation sequence from manuka shrubland to saltmarsh to mangrove shrubland.

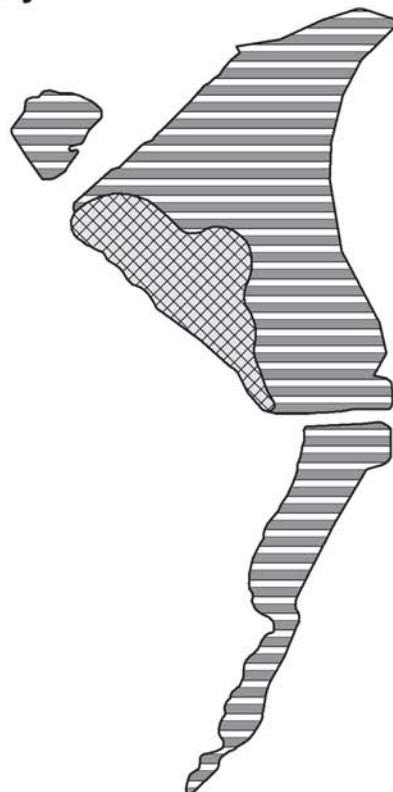


Q07/143 Takahiwai Stream Estuary



Habitat Type

-  Forest
-  Shrubland
-  Wetland
-  Duneland/Sandfield
-  Estuarine
-  Rockland



(a) The majority of the area is estuarine rushland. Sea rush is abundant, oioi is common, small mangrove seedlings and shrubs are frequent, and remuremu, sea primrose, and saltmarsh ribbonwood are occasional.

(b) The seaward margin of the site is low mangrove shrubland with occasional sea-rush.

(c) The landward margin of the site, between the rushland and Takahiwai Road is manuka shrubland. Harakeke, brush wattle, and pink bindweed are frequent, and ti kouka, kanuka, mapou, kiokio, hangehange and pampas are occasional. Japanese honeysuckle is occasional on the roadside edge of the shrubland.

Fauna

This is one of two currently known sites for North Island fernbird (Sparse) in the whole of the Whangarei Harbour (Parrish 1984; Wildland Consultants 2005). This site also supports a population of banded rail (Sparse) which has its stronghold in Northland (Wildland Consultants 2005).

Significance

All of the ecological units present are representative of their type, and these form an unbroken continuum from terrestrial to estuarine vegetation. The site is perhaps the least disturbed estuarine system in Waipu ED due to its relative remoteness from urban areas. The Takahiwai Stream Estuary provides a buffer to the Takahiwai tidal flats with which it is contiguous. The site provides habitat for two threatened bird species (banded rail and North Island fernbird), and is probably the only population of the latter in the ED. The terrestrial margins of the site, particularly alongside Takahiwai Road and Pirihi Road, are being invaded by brush wattle, Japanese honeysuckle, and pampas.

BLACKSMITH'S CREEK ESTUARY

Survey no.	Q07/144
Survey date	16 November 2006
Grid reference	Q07 441948 (2 remnants)
Area	22.0 ha (19.4 ha estuary, 2.4 ha shrubland, 0.3 ha wetland)
Altitude	sea level

Ecological units

- (a) Mangrove shrubland in estuary (83%)
- (b) Kanuka shrubland on alluvium (10%)
- (c) Sea rush–oioi rushland in estuary (5%)
- (d) Glasswort herbfield on shellbank (<1%)
- (e) Marsh clubrush sedgeland on alluvium (<1%)
- (f) Manuka–harakeke flaxland on alluvium (<1%)
- (g) Watercress–*Polygonum* sp.–bachelors button–*Baumea articulata* herbfield in stream channel (<1%)

Landform/geology

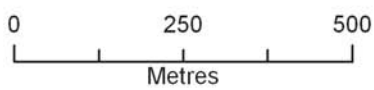
Estuarine muddy and sandy intertidal flats and shellbanks.

Vegetation







Blacksmith's Creek, which flows into the Whangarei Harbour near Marsden Point contains a diverse range of estuarine and terrestrial vegetation types. Within the reach of tidal influence mangrove shrubland (a) is dominant, with areas of sea rush–oioi rushland (c) on the edges where salt water immersion is less frequent. Shellbanks near



Q07/144 Blacksmith's Creek Estuary



Habitat Type

-  Forest
-  Shrubland
-  Wetland
-  Duneland/Sandfield
-  Estuarine
-  Rockland



the end of Albany Road support small patches of glasswort herbfield (d). Indigenous vegetation is limited in extent on the margins of the site because of industrial land, roading, and residential areas. Kanuka shrubland (b) with frequent manuka and gorse is present on the northern side of the estuary mouth, and on the southwestern edge of the estuary are small areas of marsh clubrush sedgeland (e), manuka-harakeke flaxland (f), and watercress-*Polygonum* sp.-bachelors button-*Baumea articulata*

herbfield (g). Blacksmith's Creek is in an area of increasingly intensive development, with a residential canal development currently under construction on its western side. Increased urbanisation of the catchment may lead to further hydrological changes. Local residents also report regular disturbance of the estuary by uncontrolled dogs. An area of sea rush-oioi rushland adjacent to Albany Road is being filled in with soil, tree stumps and garden refuse.

Significant flora

Suaeda novae-zelandiae (regionally significant) was recorded in the current survey (AK 297982) and is frequent in the glasswort herbfield near the end of Albany Road.

Fauna

Banded rail (Sparse) reportedly occurs in mangroves in Marsden Bay (Wildland Consultants 2005). Australasian bittern (Nationally Endangered) are also found here (Tony Beauchamp pers. comm.).

Significance

Blacksmith's Creek supports the third largest area of estuarine habitats in the ED. The site contains a diverse mosaic of estuarine, freshwater and terrestrial vegetation and is habitat for a two threatened bird species (banded rail and Australasian bittern) and a regionally significant plant species (*Suaeda novae-zelandiae*). Blacksmith's Creek is representative for the following ecological units: (b) kanuka shrubland on alluvium, (f) manuka-harakeke flaxland on alluvium, (d) glasswort herbfield on shellbank, and (e) marsh clubrush sedgeland on alluvium. Freshwater wetlands have been greatly reduced in extent throughout New Zealand, and only approximately 45 ha of natural or semi-natural wetland remains in Waipu ED. The site provides a protective buffer to the coastal fringe and is contiguous with the Marsden Bay tidal flats. New residential developments adjacent to Blacksmith's Creek, along with weed invasion and the dumping of waste, currently threaten the site. One Tree Point Seabed and Marsden Spit Government Purpose Reserve (both DOC-administered) make up 19 ha of the site.

TAURAROA RIVER FOREST REMNANTS

Survey no.	Q07/145
Survey date	10 November 2006
Grid reference	Q07 230923 (5 remnants)
Area	1.2 ha
Altitude	60 m asl

Ecological units

- (a) Totara-kahikatea forest on alluvium (40%)
- (b) Kahikatea forest on alluvium (35%)
- (c) Totara forest on alluvium (10%)
- (d) Titoki-kowhai-totara forest on alluvium (10%)
- (e) Titoki-totara forest on alluvium (5%)

Landform/geology

River flats on Holocene alluvium.

cattle and have harakeke in the understorey. A brief description of the forest types based on canopy composition is present below:

(a) The largest of the remnants (in the centre of the site) is totara forest, in which kahikatea is common and kanuka, titoki, and kowhai are occasional.

(b) The southern remnant is a grazed stand of kahikatea with occasional ti kouka and totara.

(c) The northeastern remnant comprises abundant totara and occasional kowhai.

(d) The western remnant comprises titoki, kowhai and totara with occasional manatu.

(e) The smallest remnant overall, between ecological units (a) and (c), comprises titoki and totara with occasional karaka, rewarewa, kowhai, ti kouka, and pukatea.

Significant flora

Manatu (regionally significant).

Fauna

Australasian harrier was recorded in this survey.

Significance

The site contains two representative ecological units not known from elsewhere in Waipu ED: (d) titoki-kowhai-totara forest on alluvium, and (e) titoki-totara forest on alluvium. Manatu, a regionally significant plant species, is present. All of the remnants are small, and with the exception of (d) and (e), are grazed with a sparse understorey. The remnants are isolated from other indigenous remnants on alluvium, with the majority of riverine forest in the area now being dominated by crack willow.

WAIOTIRA STREAM FOREST REMNANTS

Survey no.	Q07/148
Survey date	10 November 2006
Grid reference	Q07 259873 (19 remnants)
Area	24.7 ha
Altitude	80-205 m asl

Ecological units

(a) Totara forest on alluvium (60%)

(b) Totara-kahikatea forest on alluvium (25%)

(c) Kahikatea-totara forest on gentle hillslope (10%)

(d) Kauri forest on alluvium (5%)

Landform/geology

Predominantly gullies and hillslopes on melange (undifferentiated Mangakahia and Motatau Complex lithologies), and Miocene sandy mudstone and bluff-forming sandstone (Waitemata Group), with Holocene valley floor alluvium present locally.

Vegetation

This site comprises 19 small riparian forest remnants in the headwaters of the Waiotira Stream. Totara forest (a), with common or frequent kahikatea and kauri, is the most common vegetation type, followed by totara-kahikatea forest (b), and kahikatea-totara forest (c). Rimu, kowhai, kanuka, ti kouka, and rewarewa are occasional. The site is unusual in that it contains kauri forest (d) on alluvium. No