

## **KAURITUTAHU STREAM**

Survey no.	Q07/053
Survey date	28 October 1997
Grid reference	Q07 169 055
Area	50 ha
Altitude	80-140 m asl

### ***Ecological unit***

- (a) Kahikatea-totara riverine forest on alluvium
- (b) Totara riverine forest on alluvium
- (c) **Taraire**-totara riverine forest on alluvium
- (d) Crack willow riverine forest on alluvium
- (e) Tanekaha-totara forest on gentle hillslope

### ***Landform/geology***

Kerikeri Volcanics basaltic lava flow.

### ***Vegetation***

Riverine vegetation on Kauritutahi Stream.

- (a) West of Mannington Road, the northern branch of Kauritutahi Stream has riverine forest with kahikatea and totara common. Kohekohe and mamaku are occasional and the canopy is open in places.
- (b) Further downstream, after a break in the vegetation, totara becomes dominant with frequent kahikatea and crack willow.
- (c) Continuing downstream, taraire becomes dominant with totara common. Other species present include karaka, puriri and rewarewa.
- (d) Further downstream, crack willow becomes dominant as far as McBeth Road.

On the west side of McBeth Road type (b) occurs with occasional kanuka, manuka, kahikatea, cabbage tree, kowhai and crack willow.

After a break in the vegetation, type (a) occurs where kahikatea and totara are common and manuka and kanuka are occasional.

(e) Contiguous with the riverine vegetation, there is an area of tanekaha-totara forest on a gentle hillslope. Other canopy species present are frequent kanuka and manuka with occasional kahikatea.

Type (a) occurs in the last portion of riverine forest where there is also frequent kowhai.

Although not sighted during this survey, maire taweke has been recorded at this site.

### ***Fauna***

Spotless crane (Regionally significant species).

### ***Significance***

An example of riverine forest which is uncommon within the Ecological District and a representative site for totara forest, tanekaha-totara forest, **taraire**-totara forest and kahikatea-totara forest.

Habitat for regionally significant fauna species.



## **NEWTON ROAD REMNANTS**

Survey no.	Q07/054
Survey date	3 November 1997
Grid reference	Q07 206 053
Area	12.5 ha
Altitude	120-210 m asl

### ***Ecological unit***

- (a) Rewarewa-taraire forest on volcanic flats
- (b) Taraire forest on volcanic flats or gentle hillslope
- (c) Totara forest on volcanic flats
- (d) Taraire-totara forest on gentle hillslope

### ***Landform/geology***

Kerikeri Volcanics basaltic lava flow.

### ***Vegetation***

Several small remnants of volcanic broadleaf forest in the vicinity of Newton Road.

(a) The first remnant is located north of Maungatapere Township on the west side of State Highway 14. Taraire and rewarewa are common with occasional tawa, puriri and karaka.

The second remnant is situated east of here on the opposite side of State Highway 14 and has two vegetation types:

Dominant taraire with occasional totara, type (b) (50%).

(c) Dominant totara with occasional tawa, taraire, rimu, kahikatea and emergent rewarewa (50%).

(d) On the northeast side of Newton Road there is a taraire-totara remnant with frequent emergent rewarewa. Other species present are kahikatea, puriri and karaka.

To the north of here, type (c) occurs in the next remnant. Taraire and emergent rewarewa are present occasionally.

In a remnant on the west side of State Highway 14, type (d) is found. Associated species are occasional mangeao and emergent rewarewa.

Northeast from here, the next remnant has type (b). Dominant taraire is associated with frequent puriri and emergent rewarewa while karaka is present occasionally.

Type (b) occurs on the opposite side of State Highway 14. Associated with dominant taraire is occasional kohekohe.

Southeast from here, there is another remnant of dominant taraire with frequent emergent rewarewa. Mangeao and puriri are also present along with totara, which is found on the edges.

### ***Fauna***

Not surveyed.

### ***Significance***

Volcanic broadleaf forest remnants are a nationally rare forest type and this is a representative site for rewarewa-taraire forest.

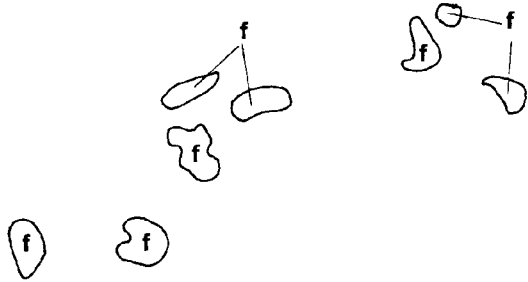
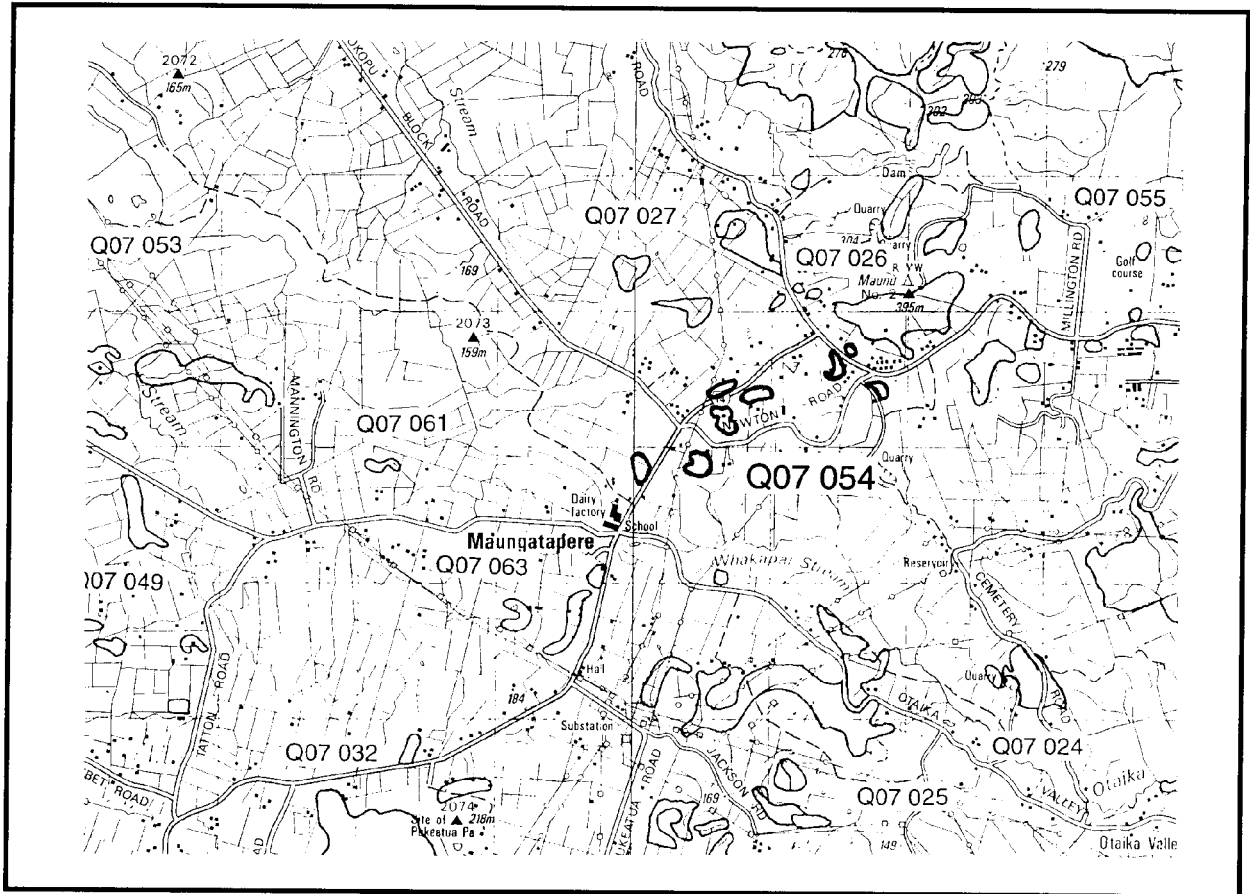


Figure 85. Newton Road Remnants, Q07 054  
 Each grid is 1000 m × 1000 m and equals 100 ha.  
 f = forest.

## **MILLINGTON ROAD REMNANTS**

Survey no. Q07/055  
Survey date 20 November 1997  
Grid reference Q07 234 057  
Area 22.5 ha  
Altitude 160-220 m asl

### ***Ecological unit***

(a) Taraire forest on volcanic flats

### ***Landform/geology***

Kerikeri Volcanics basaltic lava flow.

### ***Vegetation***

Several volcanic broadleaf remnants around Millington Road, all of which are taraire dominant.

The remnant on the west side of Millington Road also has frequent emergent rewarewa and occasional titoki, totara and puriri. The epiphyte puka is also present.

The three remnants on the golf course all have frequent emergent rewarewa. The northwestern remnant also has totara present on the edges.

On the south side of State Highway 14, the most eastern remnant has frequent emergent rewarewa with tawa, karaka and titoki also present. Kohekohe is found occasionally in the subcanopy.

West of here, the next remnant has frequent emergent rewarewa with occasional mangeao and tawa. Kohekohe is present in the subcanopy.

Further west, the next remnant has frequent emergent rewarewa with karaka and mangeao present in low numbers.

Continuing westwards, the next remnant has frequent emergent rewarewa with puriri, rimu, kahikatea and totara also present.

East of here, the last remnant has occasional kahikatea and totara with emergent rewarewa.

### ***Fauna***

Not surveyed.

### ***Significance***

Volcanic broadleaf forest is a nationally rare forest type.

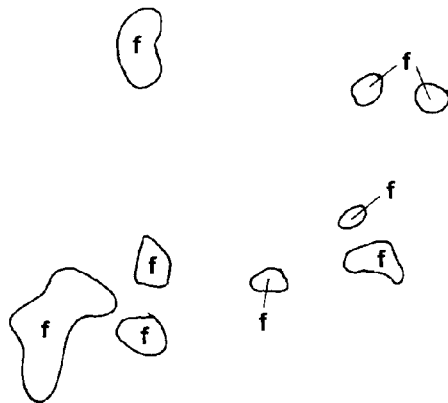
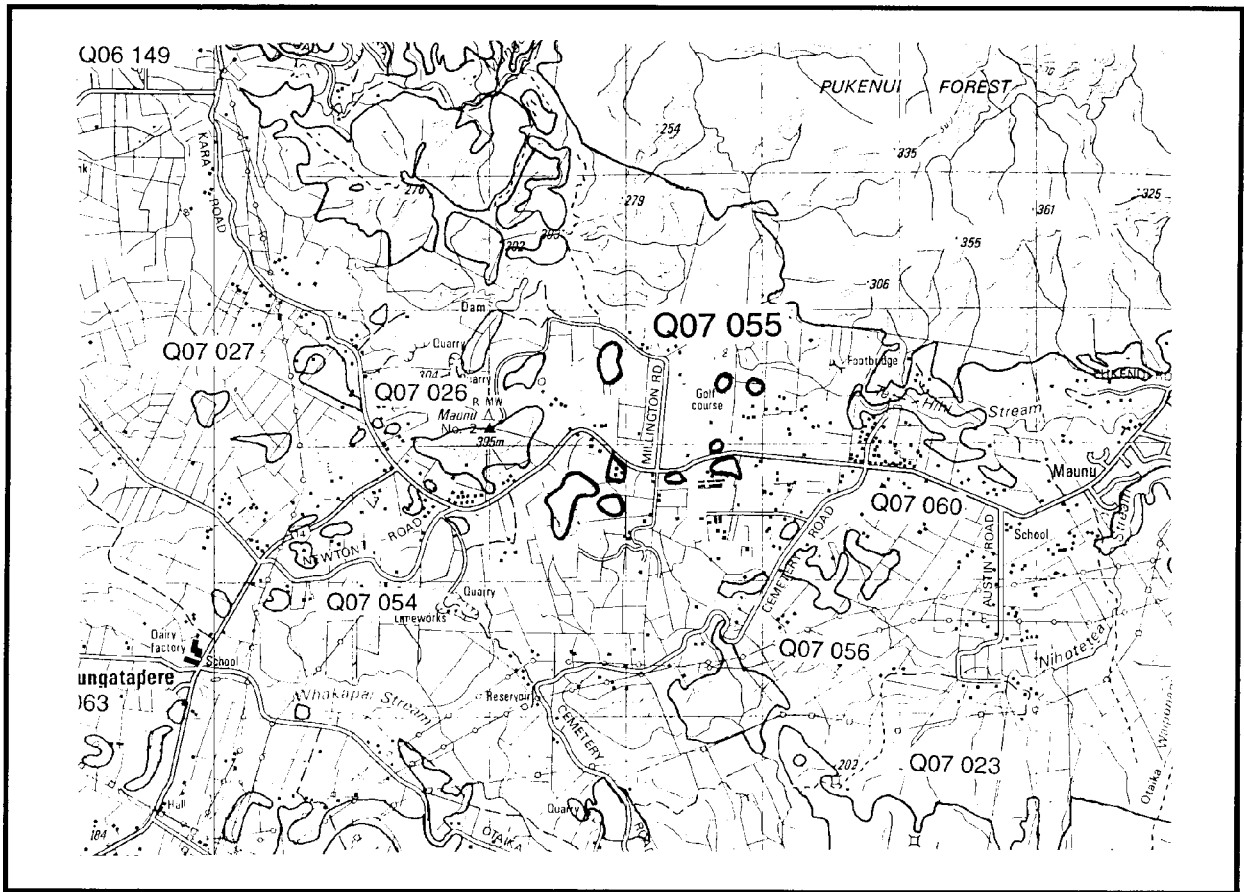


Figure 86. Millington Road, Q07 055  
 Each grid is 1000 m × 1000 m and equals 100 ha.  
 f = forest.

## CEMETERY ROAD REMNANTS

Survey no. Q07/056  
Survey date 25 November 1997  
Grid reference Q07 244 047  
Area 25 ha  
Altitude 140-180 m asl

### *Ecological unit*

(a) Taraire forest on volcanic flats or gentle hillslope

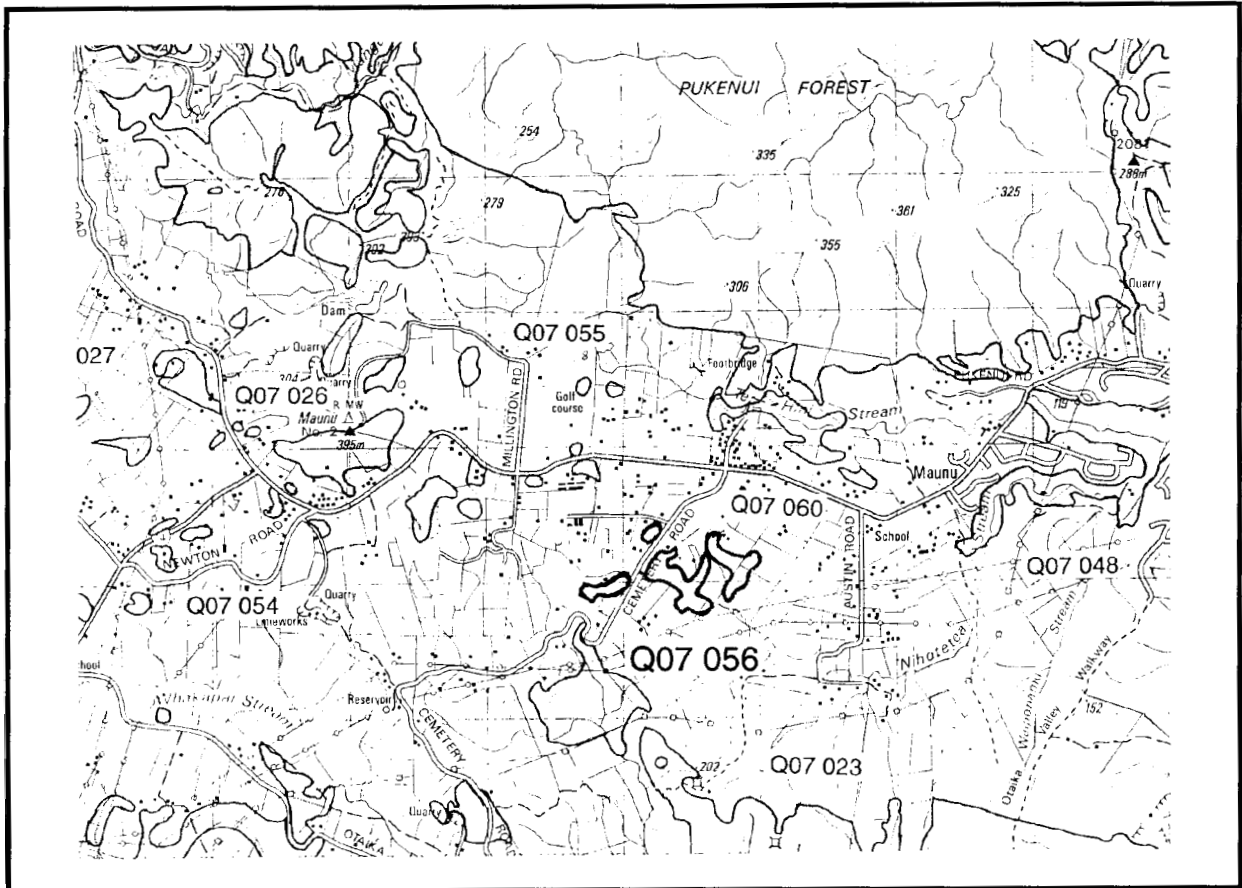


Figure 87. Cemetery Road Remnants, Q07 056

Each grid is 1000 m × 1000 m and equals 100 ha. f = forest.

### ***Landform/geology***

Kerikeri Volcanics basaltic lava flow.

### ***Vegetation***

Four volcanic broadleaf remnants on either side of Cemetery Road, all of which are taraire dominant. Part of the site is Whangarei District Council Cemetery Reserve.

The most eastern remnant has associated species of frequent totara and emergent rewarewa. Tawa and puriri are present occasionally.

Southwest of here, the second remnant has frequent totara with occasional tawa, karaka, puriri and emergent rewarewa.

Further southwest, on the other side of Cemetery Road, the southern remnant has frequent totara. Also present are occasional tawa, titoki, puriri and rewarewa.

The last remnant is northeast from here and also has occasional puriri and emergent rewarewa.

### ***Fauna***

Kukupu (Category B threatened species).

### ***Significance***

Volcanic broadleaf forest remnants are a nationally rare forest type. Representative site for taraire forest.

Habitat for a threatened bird species.

The area includes an 7.7 ha reserve administered by the Whangarei District Council and a 9 ha Queen Elizabeth II National Trust covenant.

## **TAURAROA ROAD REMNANTS**

Survey no.	Q07/057
Survey date	25 November 1997
Grid reference	Q07 195 927
Area	27.5 ha
Altitude	40-140 m asl

### ***Ecological unit***

- (a) Kahikatea-pukatea swamp forest on alluvium
- (b) Totara forest on alluvium
- (c) Taraire-totara forest on volcanic flats
- (d) Kahikatea forest on gentle hillslope
- (e) Taraire forest on volcanic flats
- (f) Kahikatea riverine forest on alluvium
- (g) **Totara**-taraire forest on hillslope

### ***Landform/geology***

Kerikeri Volcanics basaltic lava flow.

### ***Vegetation***

Several small volcanic broadleaf and alluvial forest remnants in the vicinity of Tauraoa Road.



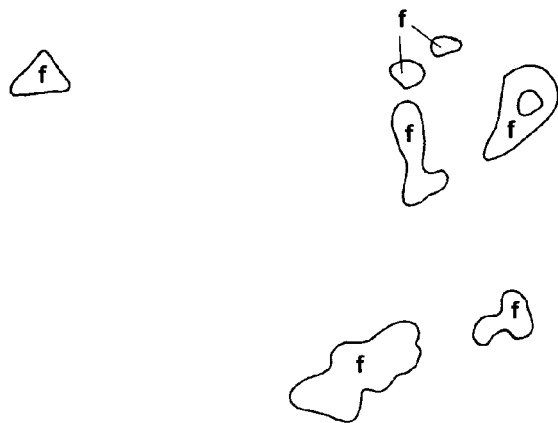
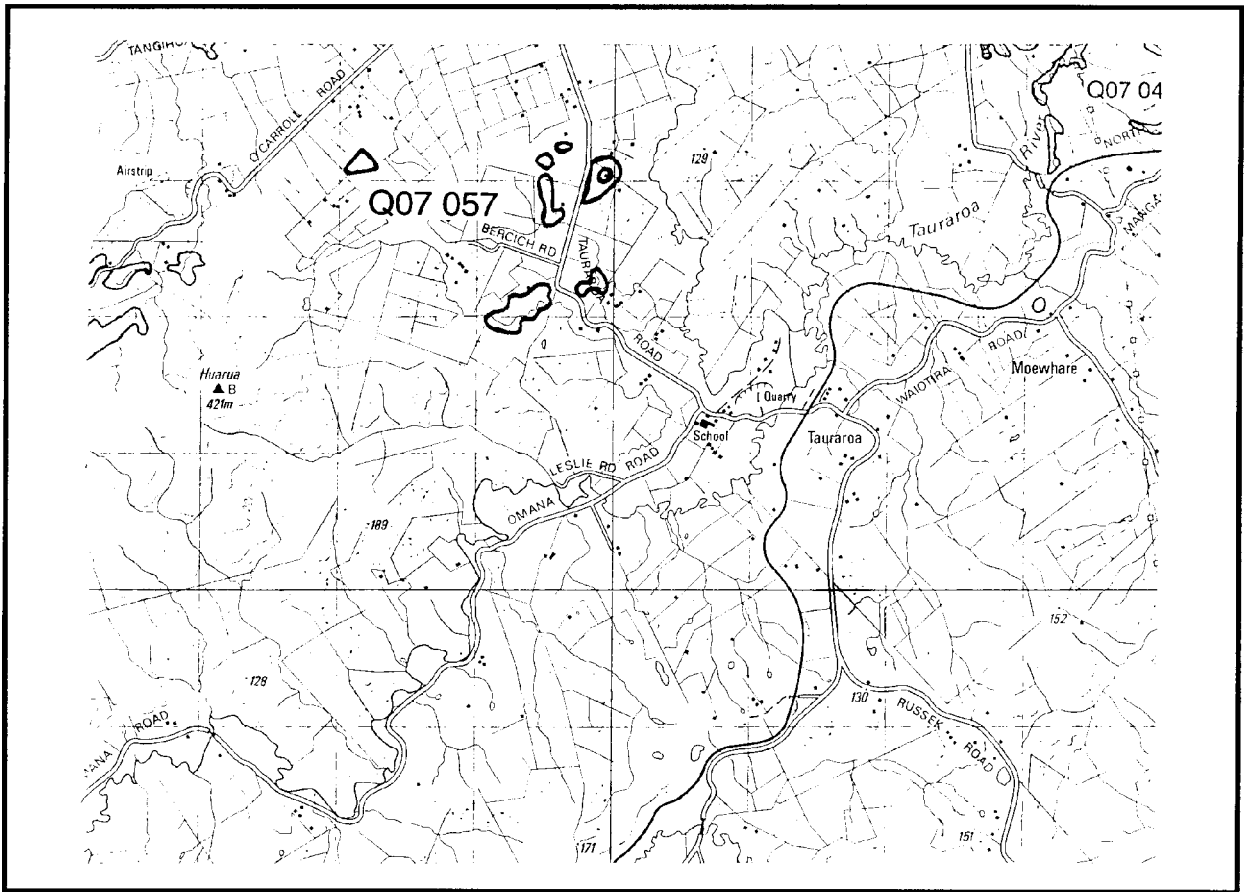


Figure 88. Tauraroa Road Remnants, Q07 057  
 Each grid is 1000 m × 1000 m and equals 100 ha.  
 f = forest.

(a) The small forest remnant to the southeast of O'Carroll Road contains two forest types. Half of the area is kahikatea-pukatea swamp forest. On the edges cabbage tree is frequent and totara is occasional.

(b) The remaining 50% is totara forest with occasional kahikatea.

(c) To the east of this and north of Berich Road there is a taraire-totara forest remnant on volcanic flats with occasional rewarewa, karaka and tawa.

(d) To the north of here there are two small remnants of kahikatea forest on a gentle hillslope with occasional totara.

(e) On the eastern side of Tauraroa Road there is a volcanic broadleaf forest remnant where taraire is abundant. Totara and karaka are also frequently present.

South of here there is another forest remnant that contains two vegetation types. Half of the area is taraire-totara forest with occasional karaka, kahikatea, titoki and pukatea, type (c), occurs.

(f) The remaining 50% consists of kahikatea riverine forest with occasional totara, kanuka and manuka present.

(g) West of here on hillslopes above a stream, the last remnant consists of abundant totara with taraire common. Kahikatea is frequent and kanuka, manuka and mamaku are occasional

### ***Fauna***

Kukupu (Category B threatened species), shining cuckoo.

### ***Significance***

This site contains examples of volcanic broadleaf, riverine and swamp forest, all of which are uncommon vegetation types in the Ecological District. It is a representative site for taraire forest and the only site in the Ecological District where kahikatea-pukatea swamp forest has been recorded.

Habitat for the threatened kukupu.

## **WHANGAREI HARBOUR**

Survey no.	Q07/058
Survey date	18 July 1996
Grid reference	Q07 380 990
Area	7214 ha
Altitude	sea level

### ***Ecological unit***

- (a) Mangrove forest in estuary
- (b) *Baumea juncea* salt marsh in estuary
- (c) Oioi-sea rush salt marsh in estuary

### ***Landform/geology***

Drowned valley system with inter-tidal mudflats, sandbanks, shell banks and rocky reefs.

### ***Vegetation***

- (a) The harbour contains substantial areas of mangroves especially on the northern and western margins.

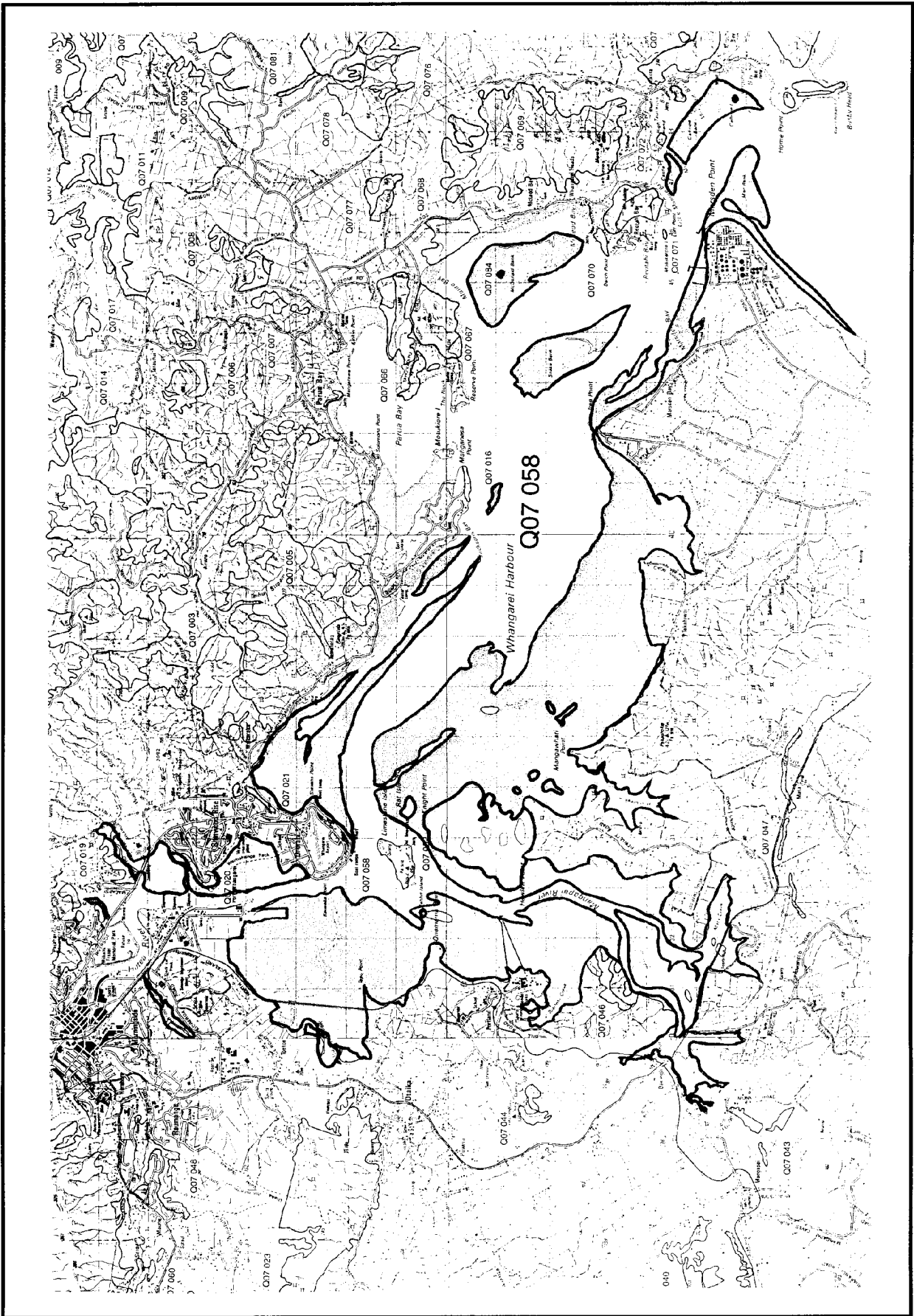
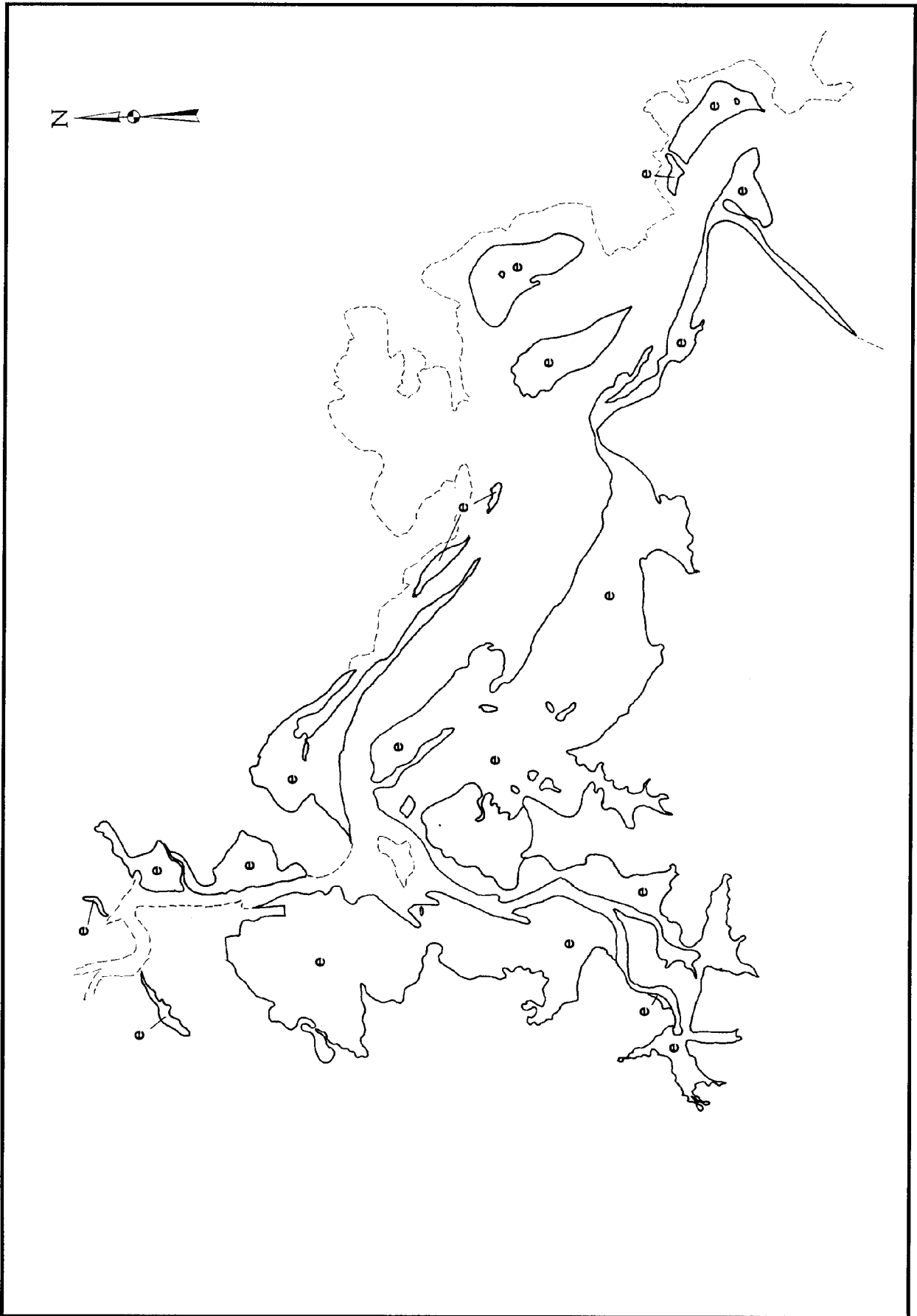


Figure 89 (above and opposite). Whangarei Harbour, Q07 058  
 Each grid is 1000 m × 1000 m and equals 100 ha. e = estuary.



(b) There are small areas of salt marsh in the upper reaches of the harbour. In some areas, *Baumea juncea* is dominant and oioi and raupo are occasional. On the drier margin where the estuary and land meet, harakeke, saltmarsh ribbonwood and pampas are present in low numbers.

(c) Other areas of salt marsh are dominated by oioi and sea rush. *Baumea juncea* occurs frequently and saltmarsh ribbonwood is common on the drier margins.

## ***Fauna***

### Birds

Category A threatened species: NZ fairy tern.

Category B threatened species: NZ dotterel, wrybill.

Category C threatened species: banded dotterel, variable oystercatcher, white-fronted tern.

Category O threatened species: white heron, royal spoonbill, reef heron, Caspian tern.

Regionally significant species: NI fernbird, banded rail. Historical record (1978) of marsh crake.

A high diversity and numbers of migrant waders utilise the harbour, including eastern bar-tailed godwit, lesser knot, Pacific golden plover, Asiatic whimbrel.

### Fish

Banded kokopu (Category C threatened species), giant bully (Regionally significant species), common bully, grey mullet, common smelt, long-finned eel, short-finned eel, mosquitofish (1986 records from Whangarei Harbour tributary, Grid reference Q07 345 034).

## ***Significance***

Whangarei Harbour is a particularly good representative example of a mangrove-dominated estuarine system, a wetland type characteristic of northern New Zealand. It is also the only site in the Ecological District where salt marsh occurs. It is an important habitat for seabirds, at times supporting over 10,000 waders and shorebirds.

The large areas of mangroves are important habitat for banded rail and other estuarine birds as well as crustaceans, invertebrates and fish.

Small amounts of salt marsh are present at the estuary/land interface but brackish zones are rare as most have been reclaimed. The salt marsh is an important buffer for mangrove forests and serves as a link between terrestrial and marine habitats; it is also habitat to NI fernbird.

There are extensive inter-tidal mudflats that originally had lush beds of eelgrass that were destroyed by sediment discharge. The mudflats are highly productive ecosystems, important as feeding sites for thousands of migrant waders, several fish species as well as a variety of marine invertebrate life.

Other habitats include low shell banks that are essential as roost sites for the large numbers of waders at high tide, as well as being important breeding sites. Stony beaches and rocky platforms are also features of the harbour, and these provide feeding and breeding grounds for reef heron and variable oystercatcher.

The harbour is habitat for several categories of threatened species (A, B, C and O), and two regionally significant species.

Seasonally, Whangarei Harbour supports over 10,000 waterbirds. These include up to 5500 bar-tailed godwit, 5500 red knot, 3000 South Island pied oystercatcher, 300–400 banded dotterel, 150 wrybill, 40 NZ dotterel, and small numbers of fairy tern and royal spoonbill. A wide variety of vagrant migrant waders have also been recorded in the harbour. Breeding birds include reef heron, banded rail, variable oystercatcher, NZ dotterel, red-billed gull and Caspian tern. A small population of NI fernbirds breeds in the salt marsh.

A regionally important geopreservation site occurs at the Skull Creek-Mangawhati Point area, being the most complete, well exposed, autochthonous middle tertiary sequence beneath allochthon in the Whangarei region, including base of allochthon (Kenny & Hayward 1993).

There is a proposal for three marine reserves to be established in the harbour, at Limestone Island, Waikaraka and Motukaroro Island (Manaia Ecological District). These reserves would protect a sequence of harbour life including mudflats, mangrove forest and rocky shore (respectively).

About 5770 hectares (80%) of the harbour area is designated as Wildlife Refuge, which prohibits hunting and deliberate disturbance to wildlife, but does not restrict public access.

## **MAUNGAKARAMEA MOUNTAIN**

Survey no.	Q07/059
Survey date	25 November 1997
Grid reference	Q07 186 945
Area	24.55 ha (23.3 ha forest, 1.25 ha wetland)
Altitude	140-220 m asl

### ***Ecological unit***

- (a) Totara forest on steep slope
- (b) Totara-towai forest on steep slope
- (c) Raupo reedland in wetland
- (d) Kahikatea forest on alluvium
- (e) Taraire forest on volcanic flats

### ***Landform/geology***

Kerikeri Volcanics basaltic scoria cone.

### ***Vegetation***

This site includes the partly forested volcanic cone of Maungakaramea Mountain and an adjacent forest remnant that is contiguous with a freshwater wetland.

- (a) The steep northern slope of the mountain is covered with abundant totara forest. Kahikatea and taraire are frequent while puriri and karaka are occasional. This forest extends down onto the flats.
- (b) On the steep eastern slope totara and towai are common with occasional taraire, kahikatea, rimu, puriri and rewarewa. The remaining slopes have been planted in pine forest.

(c) To the east of here there is a remnant consisting of three vegetation types. 10% of this area is a wetland where raupo is abundant and cabbage tree and *Coprosma propinqua* are frequent.

(d) 60% of the area, (on the eastern side of the stream), consists of a young stand of kahikatea forest with cabbage tree and towai frequent. Also present are rimu, pukatea, rewarewa and totara. Kiekie is common as an epiphyte.

(e) The remaining 30% is volcanic broadleaf forest with taraire abundant. Rewarewa is frequent and totara is occasional.

### **Fauna**

NI brown kiwi, reported from the forest remnant (Category A threatened species), kukupa, (Category B threatened species), shining cuckoo.

### **Significance**

Examples of volcanic broadleaf forest and freshwater wetland, both of which are rare habitat types in the Ecological District. It is a representative site for taraire forest, totara forest, totara-towai forest, kahikatea forest and raupo reedland.

Habitat for threatened bird species.

Maungakaramea Mountain, a geopreservation site of regional importance, is an example of a preserved scoria cone with a distinct form that has not been quarried. It is also the southernmost Quaternary Volcanic centre in Northland (Kenny & Hayward 1993).

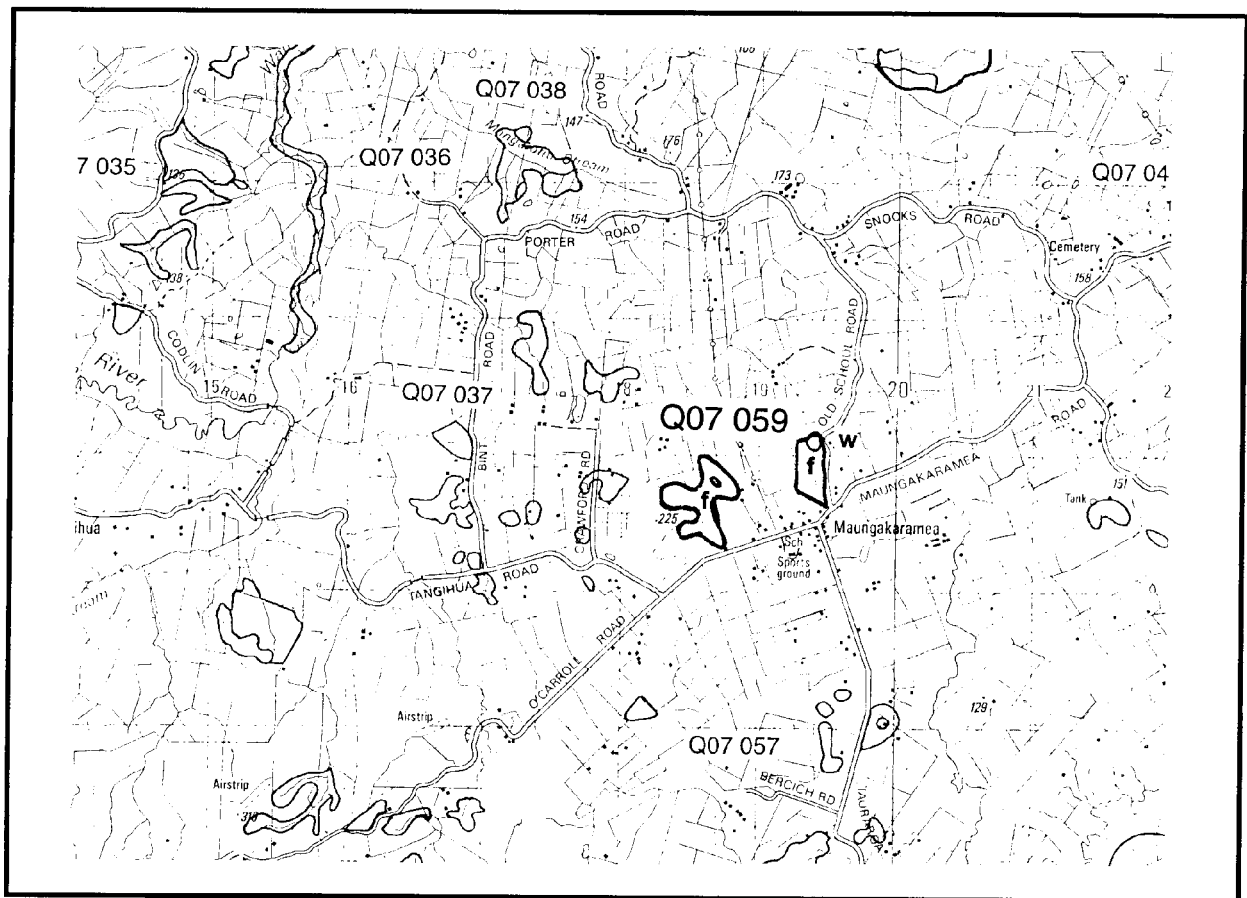


Figure 90. Maungakaramea Mountain, Q07 059

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

f = forest; w = wetland.

## TE HIHI STREAM

Survey no.	Q07/060
Survey date	8 May 1996
Grid reference	Q07 253 062
Area	24.55 ha (23.3 ha forest, 1.25 ha wetland)
Altitude	100-180 m asl

### ***Ecological unit***

- (a) **Raupo-Baumea-Scirpus** association in wetland
- (b) Kahikatea swamp forest on alluvium
- (c) Kahikatea-taraire-totara forest on moderate hillslope
- (d) Totara forest on moderate hillslope
- (e) Kahikatea forest on moderate hillslope
- (f) Taraire forest on gentle hillslope
- (g) **Totara**-kahikatea forest on moderate hillslope
- (h) **Towai**-totara forest on moderate hillslope
- (i) Taraire-totara riverine forest on alluvium

### ***Landform/geology***

Mostly Kerikeri Volcanics basaltic lava flow.

### ***Vegetation***

This site includes riverine forest on Te Hihi Stream, and a fresh water wetland and associated swamp forest at Barge Park.

- (a) The freshwater wetland is dominated by raupo with *Baumea* sedge and *Scirpus* sp. Occasional species include cabbage tree, wheki, harakeke, giant umbrella sedge, *Carex secta*, sharp spike-sedge, willow weed and sweet grass (30%).
- (b) Contiguous with the wetland is swamp forest with kahikatea common and cabbage tree and wheki frequent. Also present occasionally are maire tawake, titoki, pukatea, karaka, totara and kohekohe (25%).
- (c) Contiguous with the swamp forest is kahikatea-taraire-totara forest on a moderate hillslope. Puriri is frequent and rimu, karaka, puriri and rewarewa are occasional (25%).
- (d) The remaining 10% of this area is totara forest with occasional kahikatea.
- (e) The remnant to the west of this also has several forest types including kahikatea forest on a north facing moderate slope. Also present are occasional rewarewa, puriri, totara and cabbage tree.
- (f) On the southern edge of this remnant where the slope is gradual there is taraire forest with frequent puriri and occasional totara, titoki, rewarewa and kohekohe.
- (g) On the northern side of Te Hihi Stream on a moderate south-facing slope, totara is abundant and kahikatea is common. Rimu is also present occasionally.
- (h) The riverine forest along Te Hihi Stream is dominated by towai with totara common. Rimu, kanuka and manuka are frequent while rewarewa and mamaku are occasional.



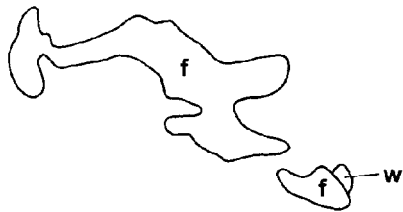
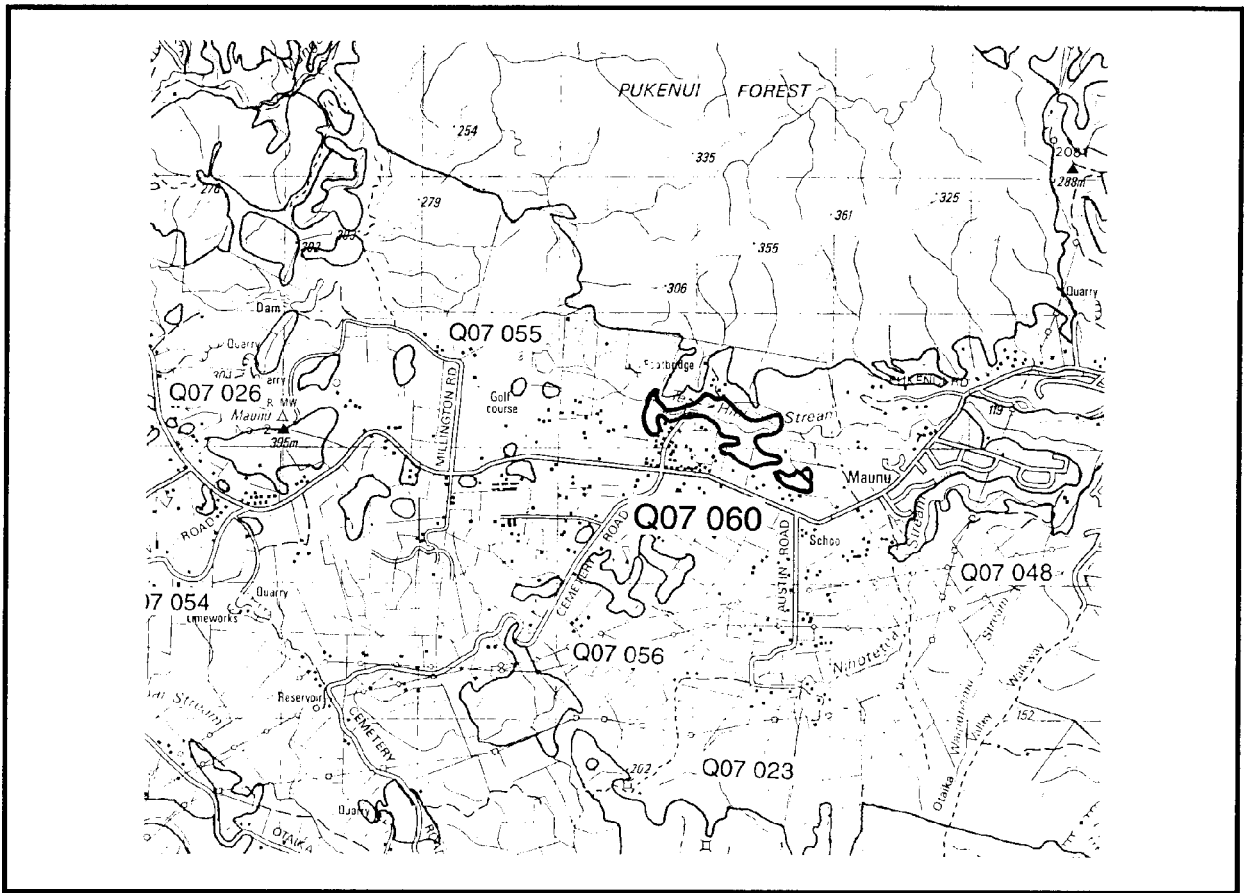


Figure 91. Te Hahi Stream, Q07 060  
 Each grid is 1000 m × 1000 m and equals 100 ha.  
 f = forest; w = wetland.

(i) Further upstream the riverine vegetation changes to taraire-totara forest with kanuka and manuka frequent. Also present are kahikatea, rimu, towai, rewarewa and mamaku.

### ***Fauna***

Kukupu (Category B threatened species), spotless crane (Regionally significant species), tui.

### ***Significance***

Examples of fresh water wetland, swamp forest and riverine forest, all of which are vegetation types that are rare in the Ecological District. A representative site for **towai**-totara forest and taraire-totara forest and the only site in the Ecological District where **raupo**-*Baumea-Scirpus* sp. wetland has been recorded.

Habitat for a threatened bird species.

## **MANNINGTON ROAD WETLAND**

Survey no.	Q07/061
Survey date	21 January 1998
Grid reference	Q07 188 048
Area	3.75 ha (1.25 ha wetland, 2.5 ha forest)
Altitude	120 m asl

### ***Ecological unit***

- (a) Manuka-raupo association in wetland
- (b) Kahikatea swamp forest on alluvium
- (c) Taraire forest on volcanic flats

### ***Landform/geology***

Wetland ponded on Kerikeri Volcanics basaltic lava flow.

### ***Vegetation***

A small freshwater intermediate wetland with associated swamp forest grading into volcanic broadleaf forest.

(a) The wetland consists of 100% vegetation with raupo and manuka common, and harakeke frequent at the western end. Cabbage tree, totara, kahikatea, pukatea and kohuhu are all occasional as emergents throughout. Other species recorded from the understorey include swamp millet, soft rush, leafless rush, lotus major, swamp kiokio, the sedges *Carex maorica*, *C. virgata*, *Baumea rubiginosa*, and *Baumea* sp.; ring fern, water fern, *Hypolepis distans*, watercress, buttercup, bracken, blackberry and introduced grasses.

The wetland has had drains put through it and is also grazed but still retains some natural character.

(b) Bordering the wetland there is a small area of swamp forest where kahikatea is abundant. Pukatea, cabbage tree, totara, mamaku and wheki are occasionally present.

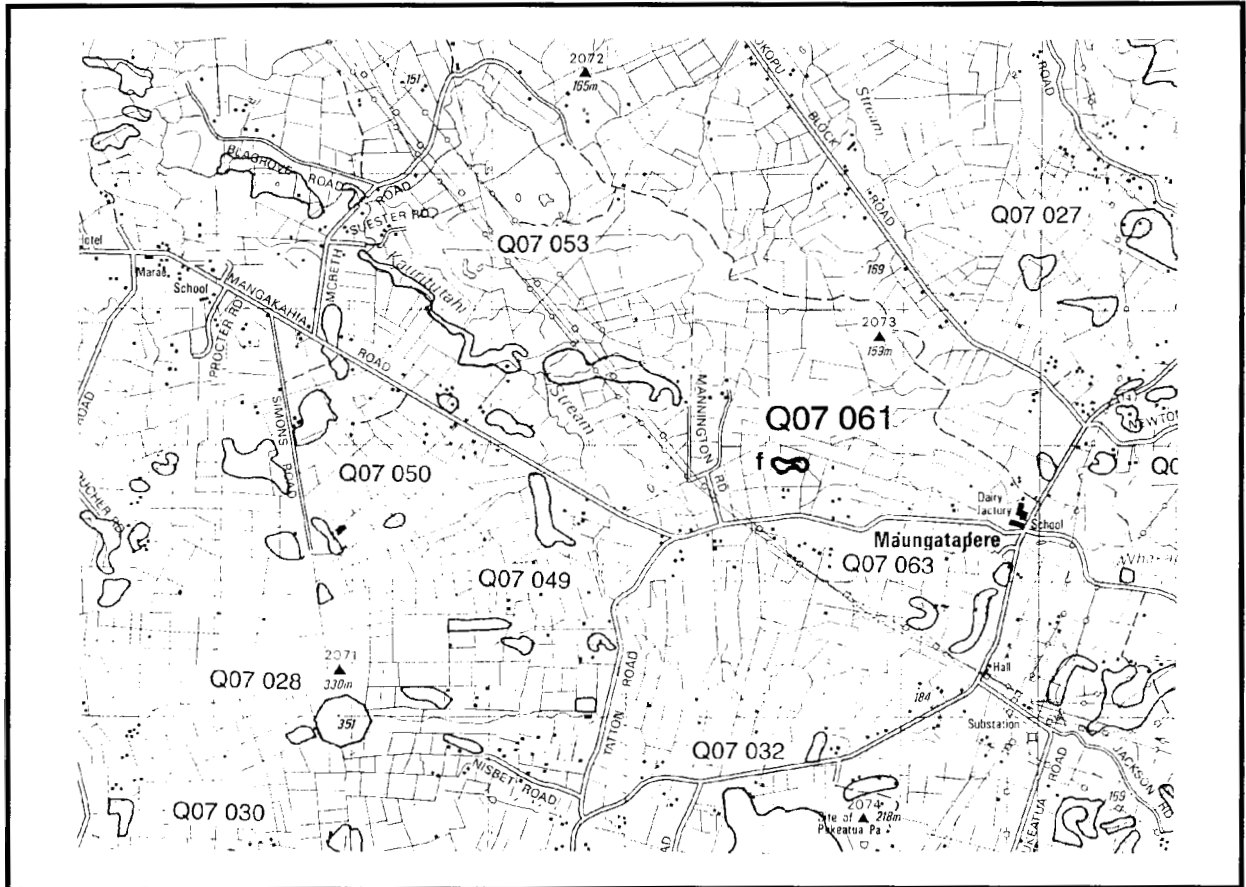


Figure 92. Mannington Road Wetland, Q07 061  
 Each grid is 1000 m × 1000 m and equals 100 ha.  
 f = forest; w = wetland.

(c) This grades into volcanic broadleaf forest where taraire is abundant and puriri is frequent. Tawa, rewarewa and karaka are present occasionally and totara is frequent on the edges.

**Fauna**

NZ kingfisher, pukeko, silvereeye, grey warbler.

Spotless crane (Regionally significant species), have been recorded here in the past, but were not recorded during this survey.

**Significance**

An example of an intermediate wetland, swamp forest and volcanic broadleaf forest, all of which are uncommon vegetation types in the Ecological District. The manuka-raupo association is the only example recorded in the Ecological District.

## LIMESTONE ISLAND & SURROUNDING ISLANDS

Survey no.	Q07/062
Survey date	23 January 1998
Grid reference	Q07 336 010
Area	78.9 ha (Limestone Island 37.6 ha, Rabbit Island 0.9 ha, Rat Island 7.5 ha, Hewlett Point Sand Islands 32.9 ha)
Altitude	0-65 m asl

### ***Ecological unit***

- (a) Exotic grassland with scattered trees and shrubs
- (b) Mangrove forest
- (c) *Baumea-Juncus* saltmarsh

### ***Landform/geology***

Limestone Island: Motatau Complex muddy limestone.

Rabbit Island: Te Kuiti Group calcareous sandstone.

Rat Island: Inter-tidal shell bank.

Hewlett Point Sand Islands: Inter-tidal shell/mud banks.

### ***Vegetation***

This site encompasses Limestone Island, the nearby Rat and Rabbit Islands and the seven outlying Hewlett Point Sand Islands. The islands are located in the mid to upper Whangarei Harbour.

(a) Limestone Island is largely devoid of its original vegetation but there is a plan in progress to revegetate the island. Most of the island consists of exotic grassland and planted shrubland. What remains of the natural vegetation is mainly at the foot of the steep slope on the southern side of the island. Here, there are scattered puriri, karaka and *Coprosma* sp. as well as single specimens of tawapou and parapara. Two pohutukawa grow on the northern shore. Mixed amongst the grassed areas of the island are patches of pohuehue.

There is a revegetation plan in progress on Limestone Island and approximately 50% of the island has been planted in mainly drought tolerant plants such as manuka, ngaio, pohutukawa, karamu and koromiko.

Rabbit Island is 50% grassland and 50% shrubland consisting of mainly kawakawa and karamu, type (a). Bracken is frequent and harakeke is occasional.

(b) Rat Island is a shell bank covered in mangrove forest.

(c) The seven low-lying Hewlett Point sand islands to the south of here are made up of shell, mud and sand banks. They are exposed at high tide and the vegetation ranges from *Baumea-Juncus* saltmarsh to mangrove forest, type (b).

### **Significant flora**

Parapara and tawapou (Regionally significant species).

### ***Fauna***

NI brown kiwi (Category A threatened species), NZ Dotterel (Category B threatened species), variable oystercatcher (Category C threatened species), Caspian tern (Category O threatened species), banded rail (Regionally significant species), SI pied oystercatcher, pied stilt, white-faced heron, black-backed gull, red-billed gull, pied shag.

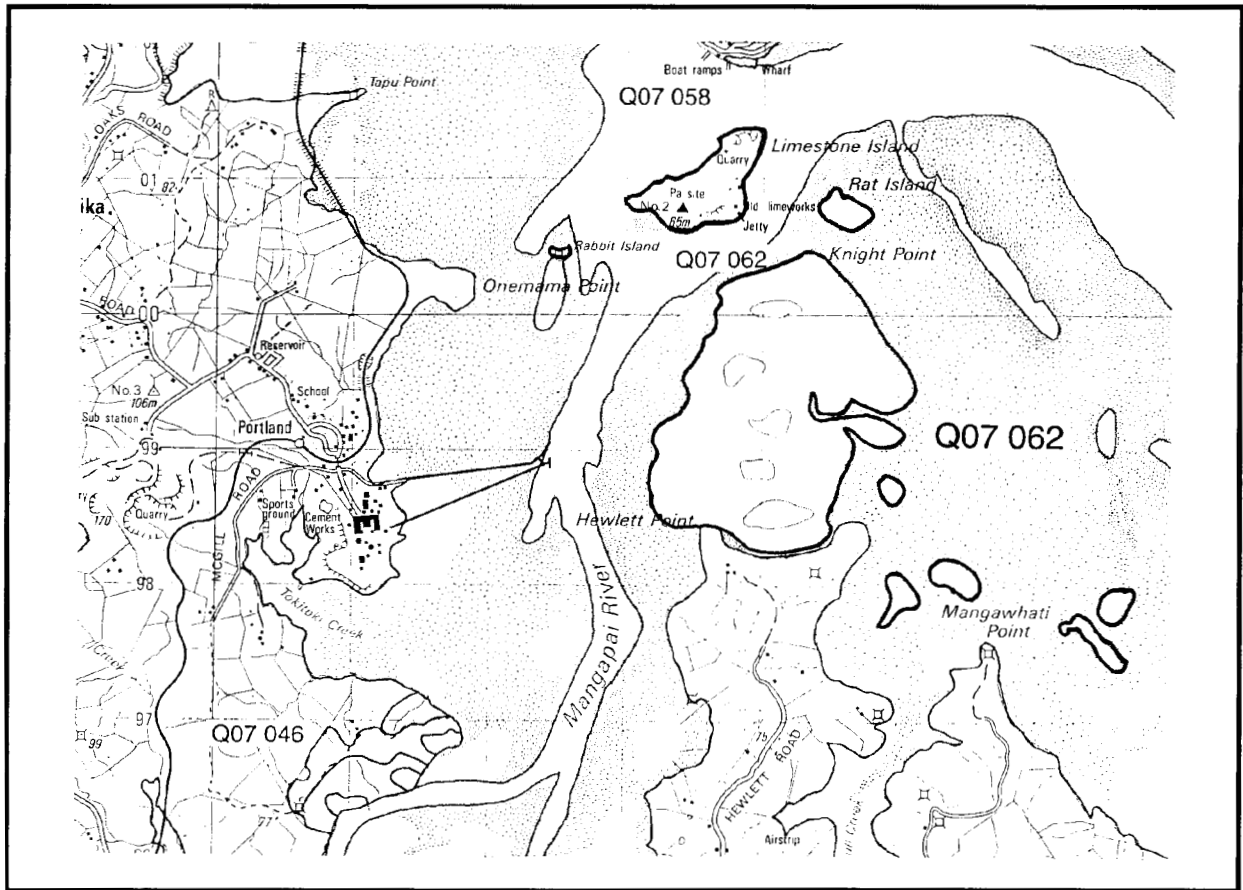


Figure 93. Limestone Island & Surrounding Islands, Q07 062  
 Each grid is 1000 m × 1000 m and equals 100 ha.  
 e = estuary; s = shrubland.

### ***Significance***

Limestone Island is one of the few islands in Whangarei Harbour. Although it is largely devoid of the original vegetation apart from a few scattered trees, these include the only examples in the Ecological District of the regionally significant tawapou and parapara. It is also a representative site for type (b) and (c).

A restoration plan includes removing pests and revegetating the island, and it is intended to introduce rare birds and lizards. NI brown kiwi have been released on the island as part of the Kiwi Management Programme.

It is also habitat for several threatened seabirds. Since predators were removed from Limestone Island the NZ dotterel has started nesting there again. The nearby Rat and Rabbit Islands are also important nesting and roosting sites for rare birds including Caspian terns and variable oystercatchers.

Limestone Island totalling 37.6 ha, is protected as a reserve by the Whangarei District Council.

The Hewlett Point Sand Islands, totalling 32.9 ha, are protected as a Government Purpose Wildlife Management Refuge, administered by the Department Of Conservation and are also important salt marsh and seabird habitats.

### **MAUNGATAPERE REMNANTS**

Survey no.	Q07/063
Survey date	3 November 1997
Grid reference	Q07 195 036
Area	13.3 ha
Altitude	140-160 m asl

#### ***Ecological unit***

- (a) Taraire forest on volcanic flat
- (b) Kahikatea forest on volcanic flat
- (c) Kahikatea-taraire forest on volcanic flat

#### ***Landform/geology***

Kerikeri Volcanics basaltic lava flow.

#### ***Vegetation***

Three small volcanic broadleaf forest remnants.

(a) The most western remnant is taraire dominant. Other species present include puriri, karaka, kahikatea and emergent rewarewa. Totara is concentrated on the edges.

(b) The central remnant has its two ends fenced and protected by a covenant. Kahikatea is dominant in the fenced northern portion. Matai, rimu, taraire and emergent rewarewa are also present.

The fenced northern portion also contains type (a), taraire dominant forest. Rewarewa is frequent and puriri occasional. There is also one *Cypressus* sp. present.

The middle portion is unfenced and is type (b), kahikatea dominant. Other species present in the canopy include taraire, totara, rewarewa, puriri, karaka, and matai.

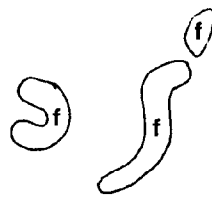
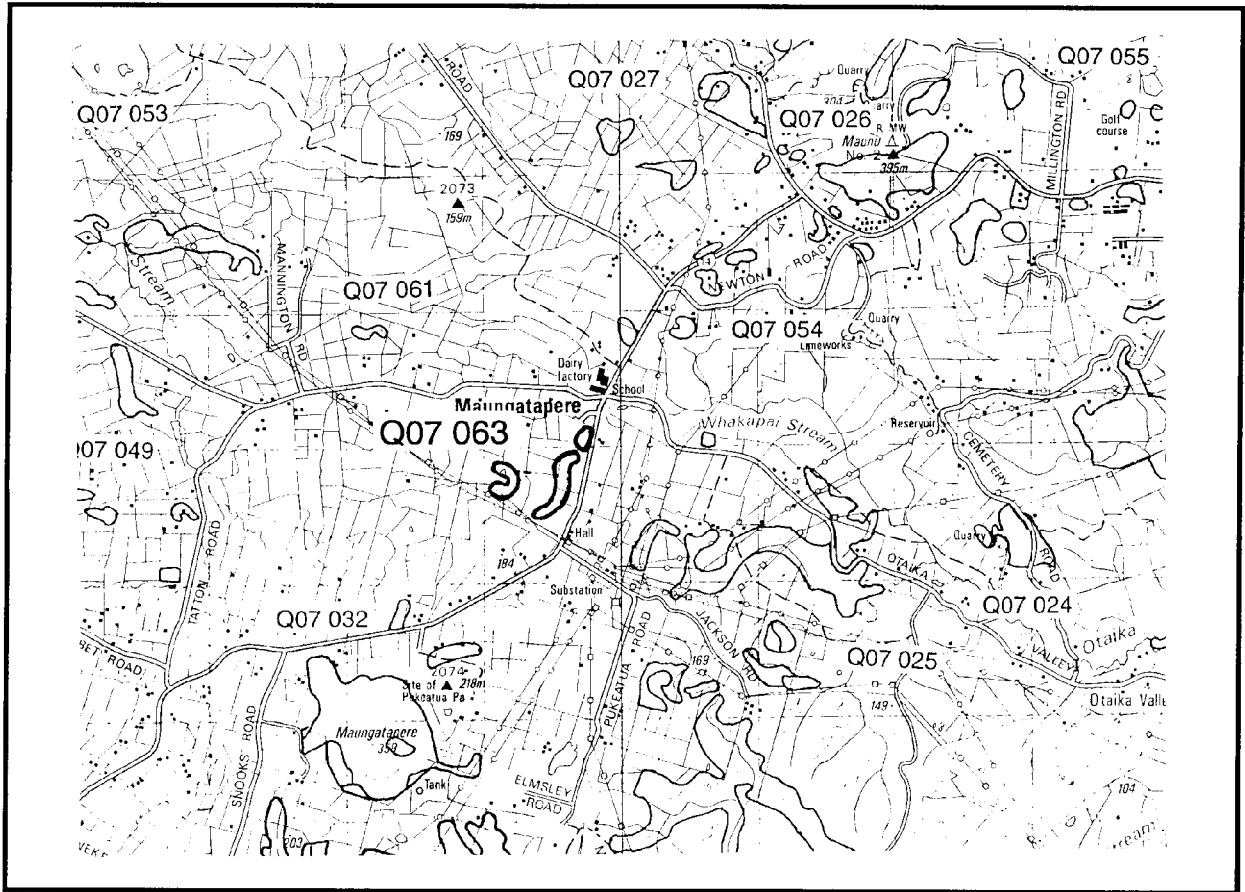


Figure 94. Maungatapere Remnants, Q07 063  
 Each grid is 1000 m × 1000 m and equals 100 ha.  
 f = forest.

The southern portion is fenced and is taraire dominant. Puriri and kahikatea are frequent while karaka and emergent rewarewa are occasional.

(c) The eastern remnant consists of kahikatea-taraire forest with frequent rewarewa. Occasional species include karaka, and totara which is concentrated on the edges.

### **Fauna**

Kukupu (Category B threatened species).

### **Significance**

Volcanic broadleaf forest is a nationally rare forest type and this site is representative for taraire forest, kahikatea forest and kahikatea-taraire forest.

Habitat for a threatened species.

Part of one of the remnants, totalling 2.6 ha in size, is protected by a Queen Elizabeth II National Trust covenant.

## **WHEKI STREAM SWAMP**

Survey no.	Q07/064
Survey date	13 June 1996
Grid reference	Q07 157 153
Area	7.5 ha wetland
Altitude	120 m asl

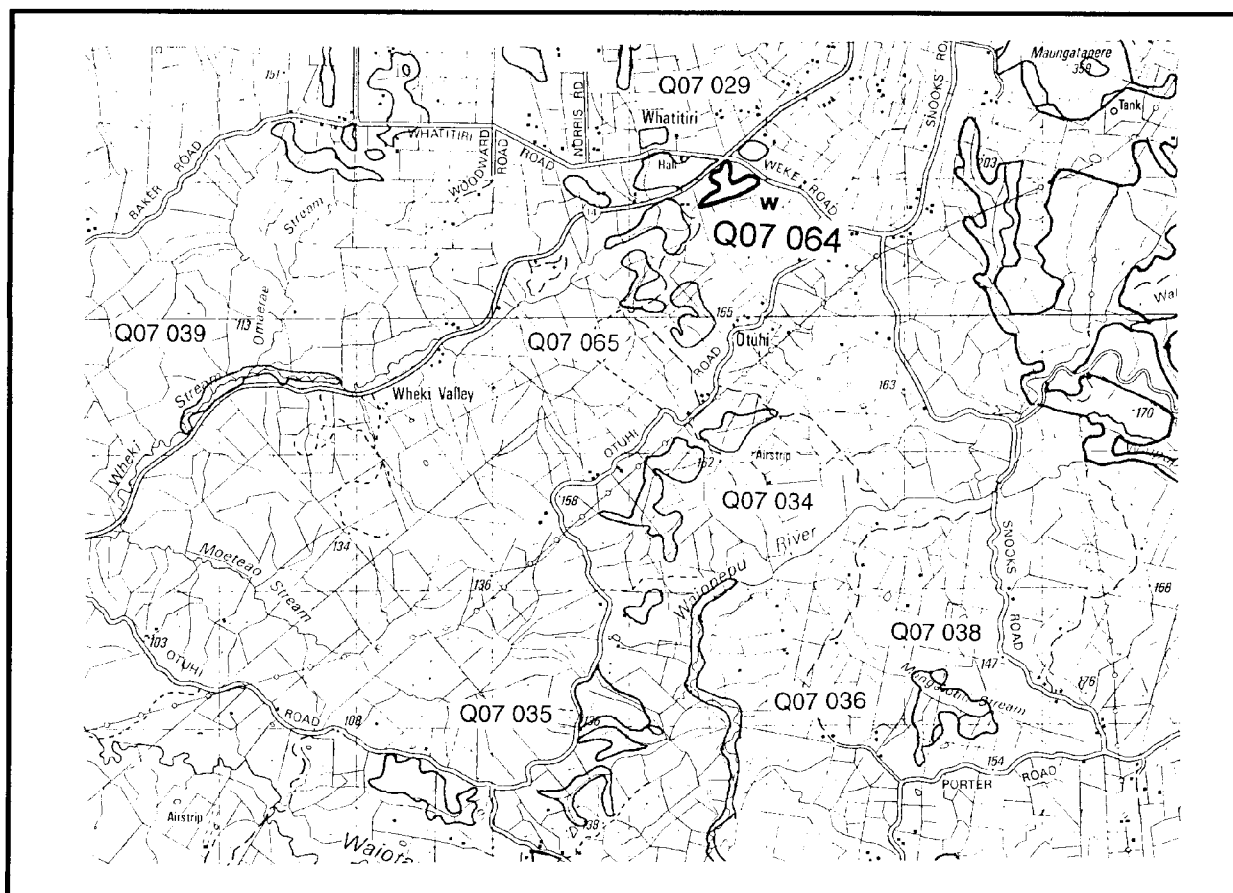


Figure 95. Wheki Stream Swamp, Q07 064

Each grid is 1000 m x 1000 m and equals 100 ha. w = wetland.



### ***Ecological unit***

(a) Raupo reedland in swamp

### ***Landform/geology***

Ponded Quaternary alluvial and swamp deposits.

### ***Vegetation***

A fertile raupo swamp on the edge of State Highway 14.

(a) The swamp consists of 100% vegetation, predominantly raupo. On the northern fringe of the swamp, wheki and bracken are frequent. Also present are pate, *Coprosma propinqua* and *C. robusta*.

### ***Fauna***

Spotless crane and banded rail (Regionally significant species), pukeko, pied stilt.

### ***Significance***

Fertile wetlands are a rare vegetation type in the Ecological District. This site is representative for raupo reedland.

Habitat for two regionally significant bird species.

## **WEKE ROAD REMNANTS**

Survey no.	Q07/065
Survey date	7 June 1996
Grid reference	Q07 151 004
Area	27.5 ha forest
Altitude	60-140 m asl

### ***Ecological unit***

- (a) Taraire forest on hillslope
- (b) **Kahikatea**-totara forest on hillslope
- (c) Kahikatea-taraire forest on hillslope
- (d) Totara forest on hillslope
- (e) Kahikatea-taraire-totara forest in gully

### ***Landform/geology***

Mangakahia Complex sandstone and mudstone.

### ***Vegetation***

Three forest remnants in the Wheki Valley.

(a) The most northern hillslope remnant is taraire dominant with totara, kahikatea and emergent rewarewa occurring frequently. Also present are pukatea, nikau and mamaku.

(b) The remnant to the south of here on a moderate hillslope, consists of two vegetation types including forest of abundant kahikatea with totara common. Nikau is occasionally present. (20%).

(c) Also present in the above remnant is taraire forest with emergent kahikatea. Totara, puriri and emergent kauri are frequent while rimu, mamaku and emergent rewarewa are occasional (80%).

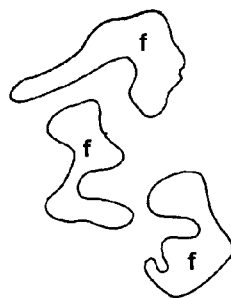
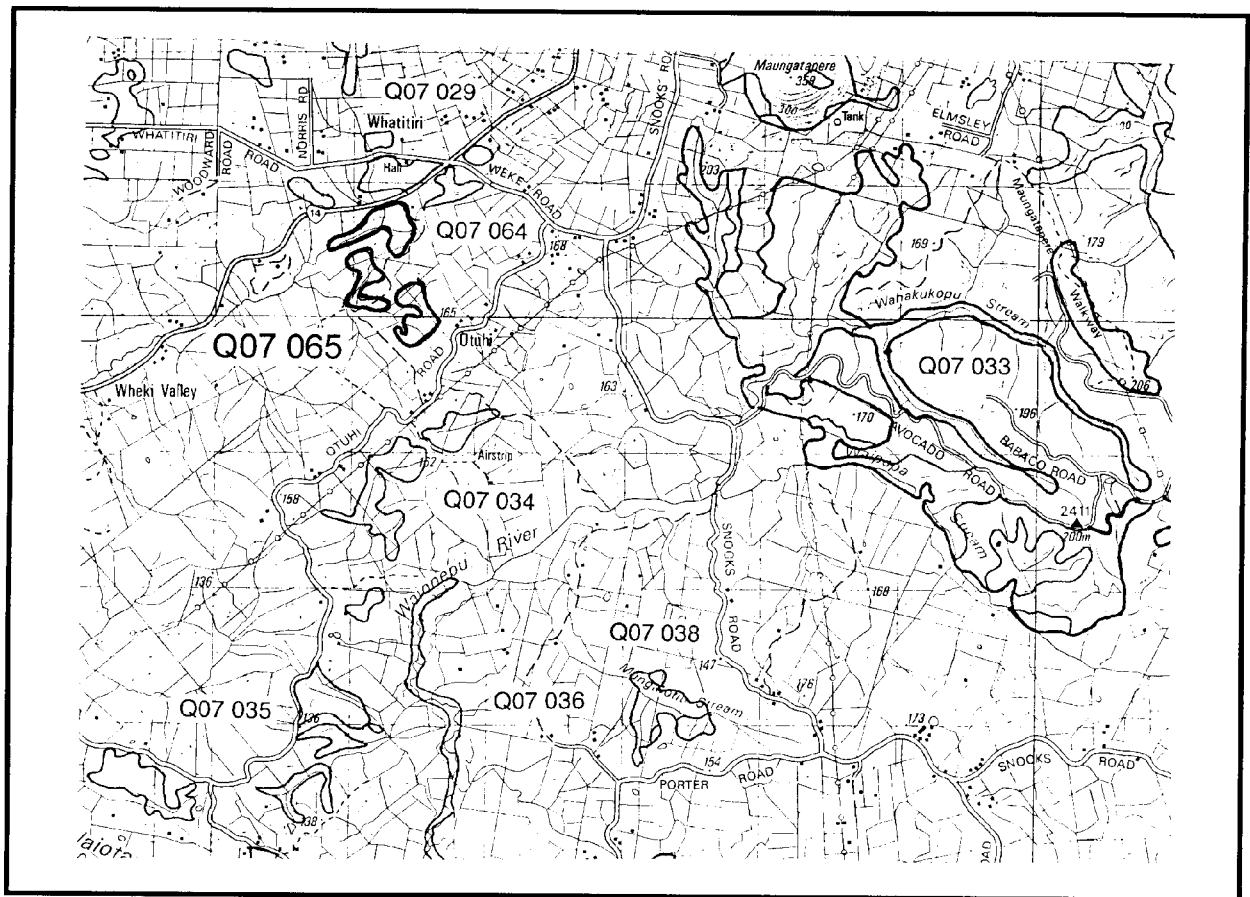


Figure 96. Weke Road Remnants, Q07 065  
 Each grid is 1000 m × 1000 m and equals 100 ha.  
 f = forest.

(d) The remnant to the southeast of here also contains two vegetation types. On a moderate west-facing hillslope totara is abundant but has a discontinuous canopy. Manuka and mamaku are also present occasionally (75%).

(e) In the gullies of the above remnant, kahikatea-taraire-totara forest is present. Pukatea, rimu, tawa, towai, manuka and emergent rewarewa are occasional (25%).

### ***Fauna***

Kukupu (Category B threatened species).

### ***Significance***

This site is representative for kahikatea-taraire-totara forest and **kahikatea-totara forest**.

Habitat for a threatened bird species.

## **McDONALDS ISLAND**

Survey no.	Q07/084
Survey date	18 June 1996
Grid reference	Q07 452 989
Area	0.2 ha
Altitude	0-5 m asl

### ***Ecological unit***

(a) Exotic grassland

### ***Landform/geology***

Te Kuiti Group glauconitic sandstone.

### ***Vegetation***

(a) This small, low island is now largely covered in kikuyu grass since the original pohutukawa trees on the island died out within the last five years. Sparse pockets of native vegetation remain and these consist of occasional taupata, leather-leaf fern, shore groundsel and native celery. Mallow, prickly sow thistle and vetch are among the introduced plants on the island. Native iceplant is still frequent on the low rocky cliff that surrounds the island. Beyond this, a wide rocky platform is exposed at low tide.

Three young pohutukawa trees and several harakeke plants have been planted on the island. The extensive McDonald shell bank surrounding the island is evident at low tide and is utilised by large numbers of sea birds.

### ***Fauna***

Reef heron (Category O threatened species), pied shag, black shag, black-backed gull. The shell bank is a feeding area for variable oystercatcher (Category C threatened species), bar-tailed godwit and white-faced heron.

Shore skink.

### ***Significance***

Habitat for threatened bird species.

The large surrounding area of shell bank is a feeding ground for a variety of seabird species.

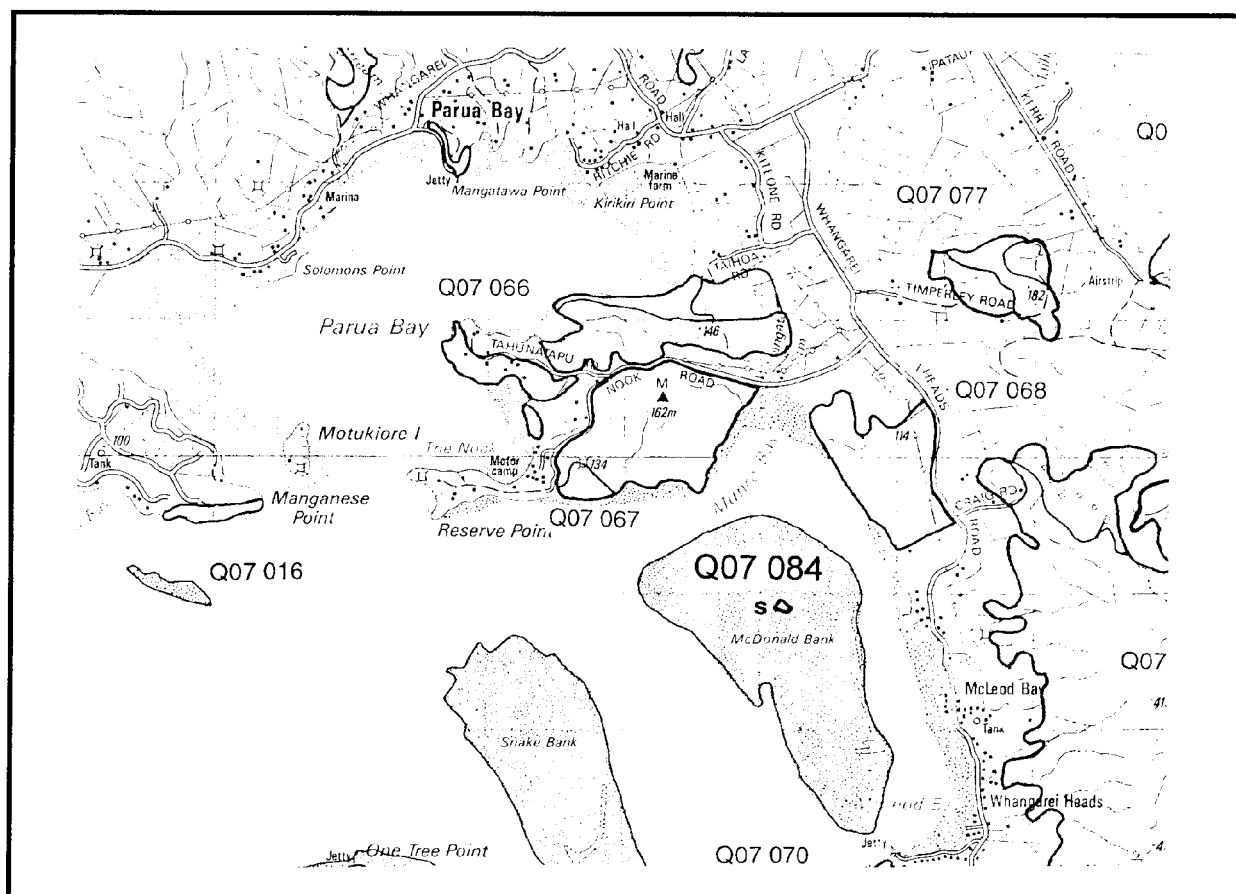


Figure 97. McDonalds Island, Q07 084

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

s = shrubland.

### CALLIOPE ISLAND

Survey no.	Q07/085
Survey date	18 June 1996
Grid reference	Q07 486 943
Area	0.28 ha
Altitude	0-6 m asl

#### **Ecological unit**

- (a) Coastal pohutukawa forest on hillslope
- (b) Coastal harakeke shrubland in splash zone

#### **Landform/geology**

Mangakahia Complex mudstone.

#### **Vegetation**

A small island of coastal forest and shrubland near the entrance to Whangarei Harbour. At low tide the surrounding Calliope shell bank is evident.

- (a) Coastal forest with an open canopy featuring abundant pohutukawa covers most of the island. Manuka is frequent in the canopy and houpara, *Coprosma macrocarpa*, pampas, coastal astelia and bracken are also present.

(b) Surrounding the forest there is zone of coastal shrubland with harakeke dominant. Also present are frequent manuka, rengarenga lily and the coastal needle grass. Occasional species include kawakawa, taupata, native iceplant, knobby clubrush and coastal astelia.

**Fauna**

Reef heron (Category O threatened species), variable oystercatcher (Category C threatened species).

**Significance**

A representative example of coastal forest and shrubland which are rare vegetation types in the Ecological District.

Habitat for two threatened bird species, including two breeding pairs of reef heron and variable oystercatcher.

The surrounding shellback is an important feeding ground for many seabirds.

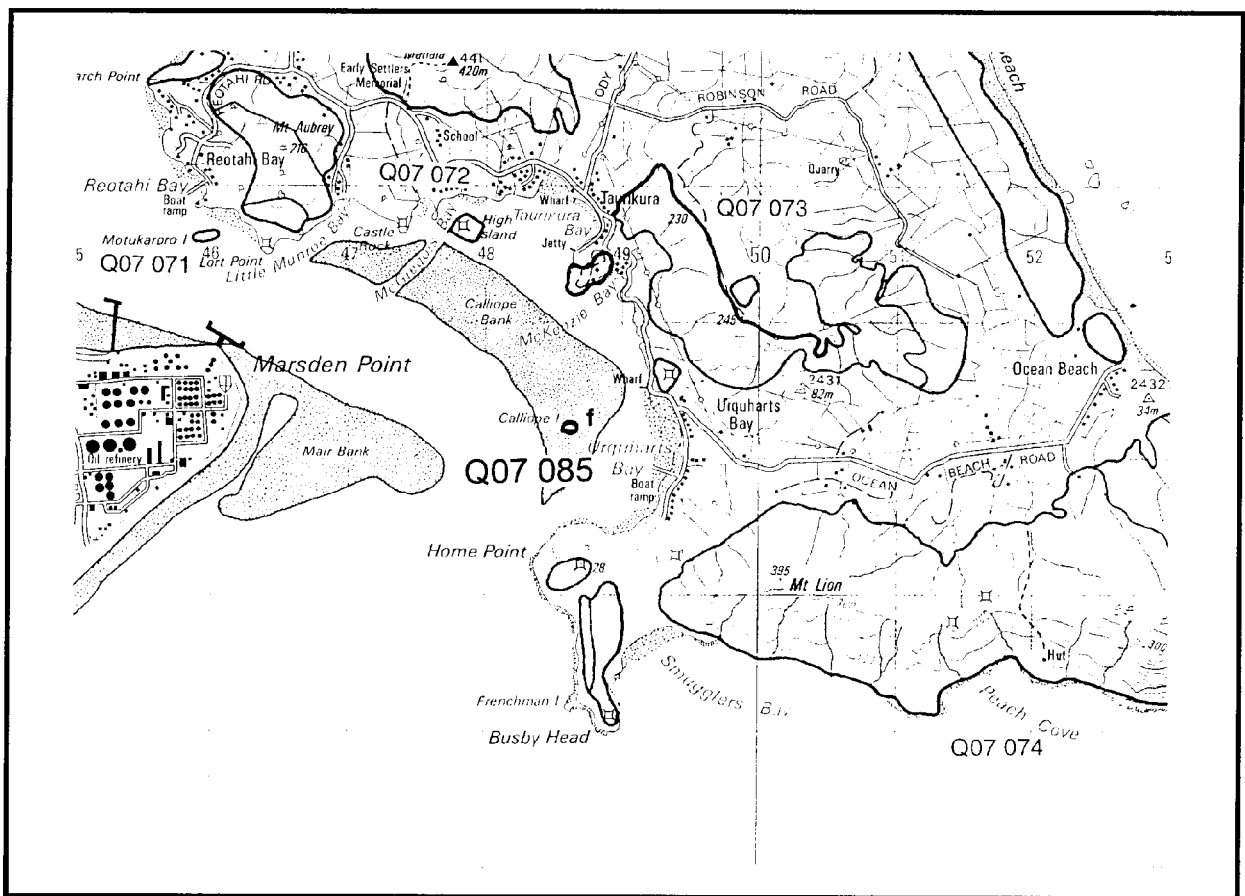


Figure 98. Calliope Island, Q07 085  
 Each grid is 1000 m x 1000 m and equals 100 ha.  
 f = forest.

## MANGAKAHIA RIVER

Survey no.	P07/024
Survey date	17 October 1994
Grid reference	P07 044 030
Area	48.1 ha (40 ha forest, 8.1 ha swamp forest)
Altitude	0-40 m asl

### ***Ecological unit***

- (a) Totara-weeping willow riverine forest on alluvium
- (b) Totara riverine forest on alluvium
- (c) Taraire-totara forest on hillslope
- (d) Kanuka/manuka riverine forest on alluvium
- (e) Kanuka/manuka-totara riverine forest on alluvium
- (f) Cabbage tree-*Coprosma propinqua* swamp forest on alluvium
- (g) Kahikatea swamp forest on alluvium
- (h) Kahikatea-kanuka forest on alluvium
- (i) Taraire forest on gentle hillslope

### ***Landform/geology***

Quaternary alluvial deposits.

### ***Vegetation***

Riverine forest along the Mangakahia River.

(a) North of the Mangakahia River Bridge, totara-weeping willow riverine forest lines the banks of the Mangakahia River. Other species present are frequent kanuka and manuka with occasional kowhai, karaka, titoki and taraire.

(b) North of, and adjacent to the bridge, there is an area of totara riverine forest. Crack willow is frequent and matai, kowhai, karaka, mamaku, kahikatea, kanuka, manuka and cabbage tree are occasional.

In the separate riverine forest remnant to the southwest of the bridge, type (b), totara is the dominant species. Titoki is frequently present and mangeao, tawa, taraire, kanuka, manuka and kowhai are occasional.

(c) South of the bridge, on the eastern hillslope above the river, there is taraire-totara forest present. Other species include tawa, titoki, manatu, manuka, kanuka, wheki, nikau and karaka.

(d) Downstream from here, there is kanuka/manuka riverine forest lining the riverbanks. Frequent species include totara and crack willow. There is also occasional kowhai, titoki, manatu and mamaku. This type of forest continues downstream intermittently as far as Booth Road.

Below this, there is an area of riverine forest and shrubland enclosed by a deep loop in the river. This area of private land was not accessed or described. However, this area has been included as part of this site because examples of riverine forest enclosed by a loop in the river are rare. This area warrants further botanical assessment. Most riverine forest that remains in this Ecological District is a thin strip along the river edges.

(f) Further downstream at the southern end of the site, the last area has several vegetation types. This includes cabbage tree-*Coprosma propinqua* swamp

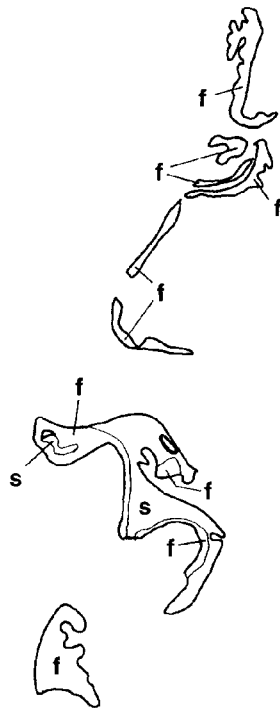
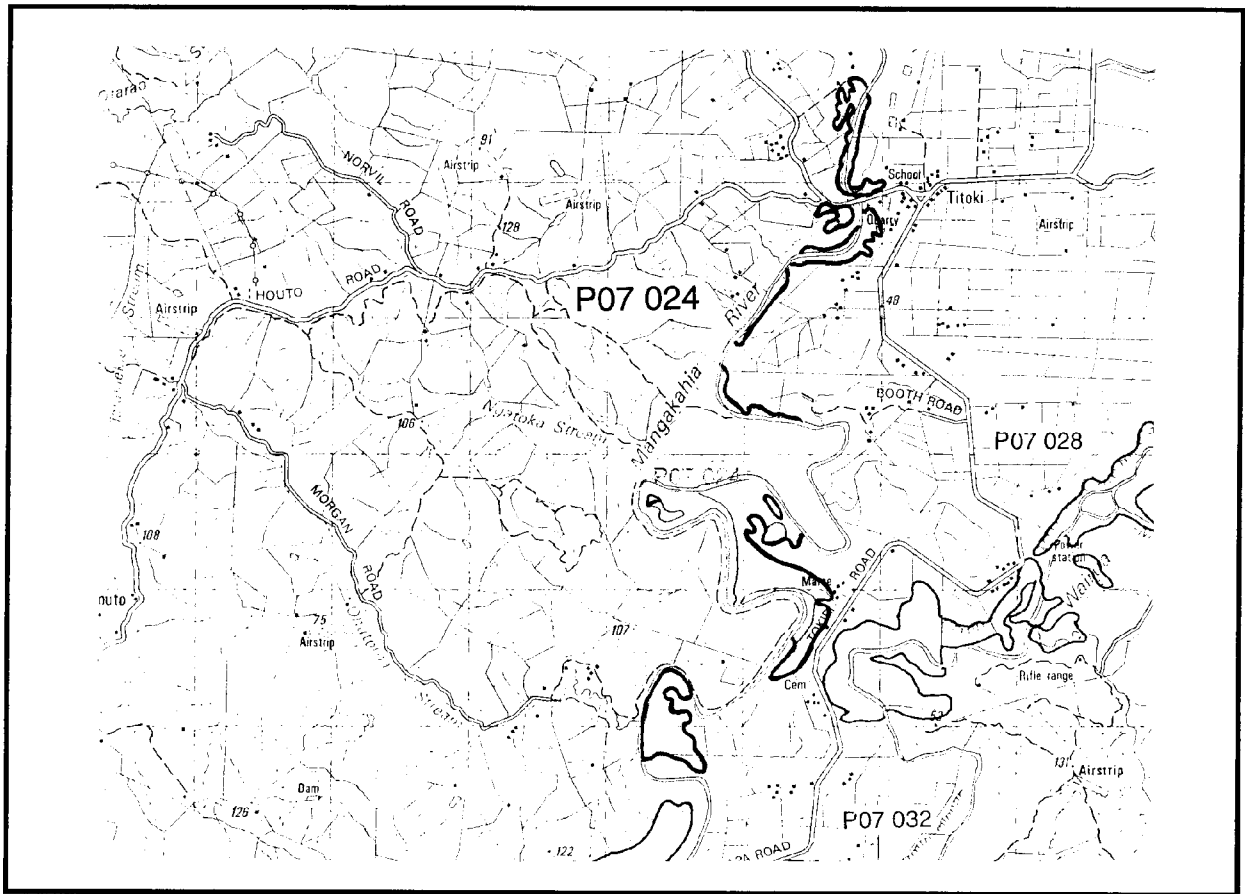


Figure 99. Mangakahia River, P07 024  
 Each grid is 1000 m × 1000 m and equals 100 ha.  
 f = forest; s = shrubland.

forest with frequent kahikatea bordering the river. Kaikomako and *Carex* sp. are also present.

(g) There is also an area of kahikatea dominant swamp forest bordering the river. Narrow-leaved houhere is also present occasionally.

(h) This grades into kahikatea-kanuka forest further away from the riverbank. Here, totara is frequent and matai, rimu, kauri, kowhai, manatu, kohuhu, taraire, karaka and mamangi are also present.

(i) On the gentle hillslope above the river, taraire forest becomes dominant with frequent mamangi. Other species present include towai, matai, titoki, kanuka and rimu.

#### Significant flora

Kaikomako and narrow-leaved houhere (Regionally significant species).

#### ***Fauna***

Not surveyed.

#### ***Significance***

An example of swamp forest, riverine forest and shrubland, all of which are uncommon vegetation types in the Ecological District. This site is the best representative example of riverine forest along the whole length of the Mangakahia River in the Whangarei and Tangihua Ecological Districts. Upstream from there, the Mangakahia riverbank is not significantly forested again until the headwaters in Mataraua Forest (Tutamoe Ecological District).

This site is representative for kanuka/manuka riverine forest, taraire forest, taraire-totara forest and the only site in the Ecological District where cabbage tree-*Coprosma propinqua* swamp forest has been recorded.

Presence of two regionally significant flora species, kaikomako, and narrow-leaved houhere which is near its northern limit at this site.

### **WAITOMOTOMO STREAM**

Survey no.	P07/025
Survey date	9 December 1997
Grid reference	P07 070 084
Area	17.5 ha
Altitude	20-60 m asl

#### ***Ecological unit***

(a) Totara riverine forest on alluvium

#### ***Landform/geology***

Quaternary alluvial deposits and Kerikeri Volcanics basaltic lava flow forming a natural bridge.

#### ***Vegetation***

Two small remnants of riverine forest on the Waitomotomo Stream.

The remnant that is furthest east is exclusively totara riverine forest.

The second riverine remnant is also totara forest but it has kahikatea, rimu, kanuka and manuka occurring occasionally.



**Fauna**

Not surveyed.

**Significance**

An example of riverine forest, an uncommon vegetation type that is also a representative example for the Ecological District.

A geopreservation site of national significance, it is the best example of a natural bridge formed in lava in New Zealand (Kenny & Hayward 1993).

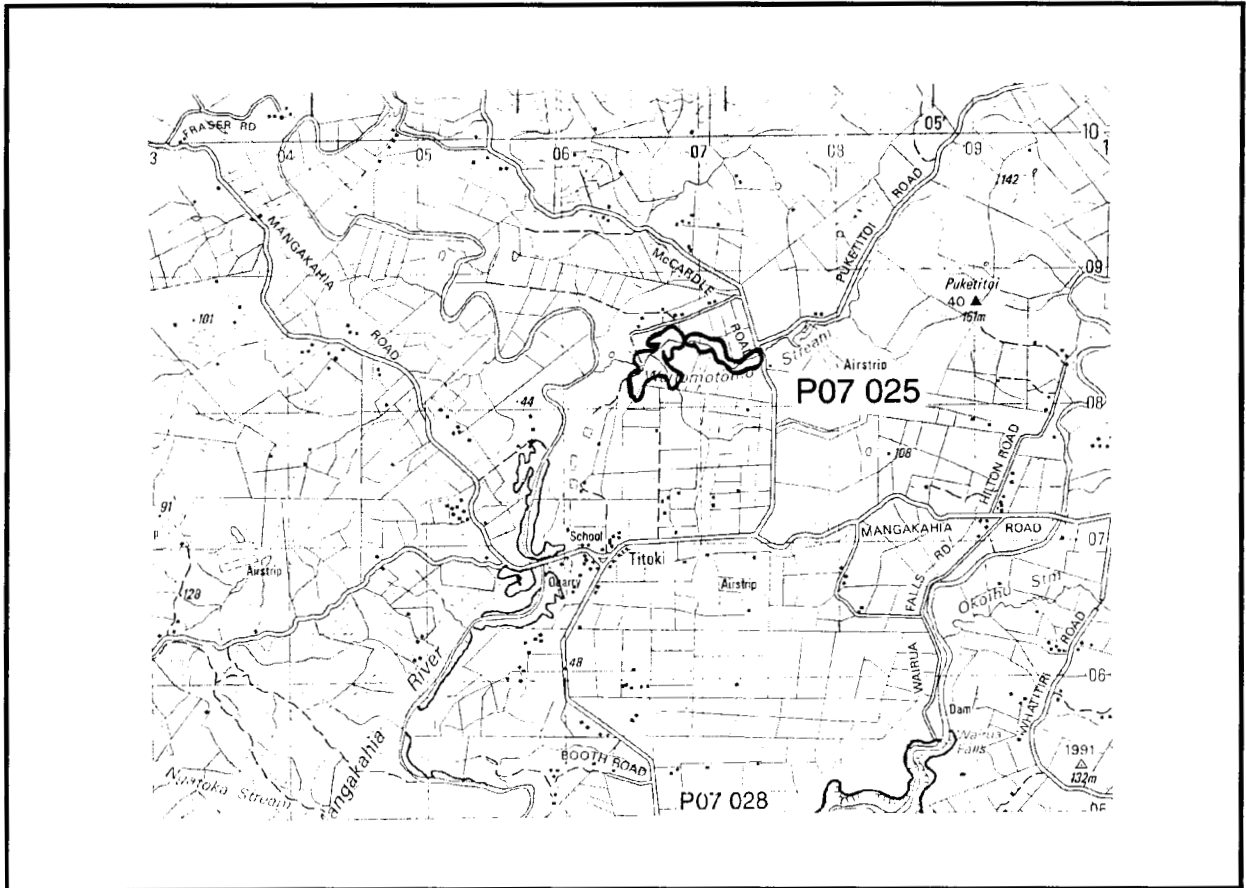


Figure 100. Waitomoto Stream, P07 025  
Each grid is 1000 m × 1000 m and equals 100 ha.  
f = forest.

## WAIKUA FALLS SCENIC RESERVE

Survey no.	P07/028
Survey date	24 June 1996
Grid reference	P07 074 046
Area	128.3 ha (90.8 ha forest, 37.5 ha shrubland)
Altitude	0-60 m asl

### *Ecological unit*

- (a) Kanuka-karaka-tawa riverine forest on alluvium
- (b) Taraire-totara riverine forest on alluvium
- (c) Tawa-totara riverine forest on alluvium
- (d) **Taraire**-titoki riverine forest on alluvium
- (e) Kahikatea-kanuka riverine forest on alluvium
- (f) Manatu-manuka riverine forest on alluvium
- (g) Manuka riverine shrubland on alluvium
- (h) **Kanuka**-manatu riverine forest on alluvium
- (i) **Manuka**-totara riverine shrubland on alluvium

### *Landform/geology*

Waterfall and gorge cut in Kerikeri Volcanics basaltic lava flow.

### *Vegetation*

This site extends from the Wairua Falls down the gorge to just past the cemetery on Tokiri Road and includes the Wairua Falls Scenic Reserve. Riverine forest on steep river banks and riverine shrubland constitutes this site.

- (a) Below the Wairua Falls on the steep riverbanks there is kanuka-karaka-tawa forest with frequent titoki, taraire and totara. Akeake, houhere, tanekaha and, kauri are occasional and puka is also present as an epiphyte.
- (b) About 500 m downstream from the falls the forest changes to taraire-totara with occasional tawa, pukatea, rewarewa, rimu and mamaku.
- (c) Just upstream from the power station, tawa and totara are co-dominant with an incomplete canopy. Karaka and titoki are frequently present with puriri, taraire, kahikatea, rimu, kowhai, rewarewa, pukatea and mamaku occasional. Puka is also present as an epiphyte.
- (d) Below the power station on the steep western riverbank taraire is dominant with titoki less common. Karaka and puriri are frequent with tawa, kauri, kowhai, rewarewa, totara and cabbage tree also present.
- (e) On the opposite gently sloping riverbank kahikatea-kanuka riverine forest is associated with frequent cabbage tree.
- (f) The separate riverine forest remnant to the south of this is dominated by manatu and manuka with frequently occurring kowhai and cabbage tree. Puriri and houhere are also present in low numbers.
- (g) Downstream from type (d) riverine forest grades into riverine shrubland consisting predominantly of short manuka (1-2 m) with occasional totara, cabbage tree and gorse.

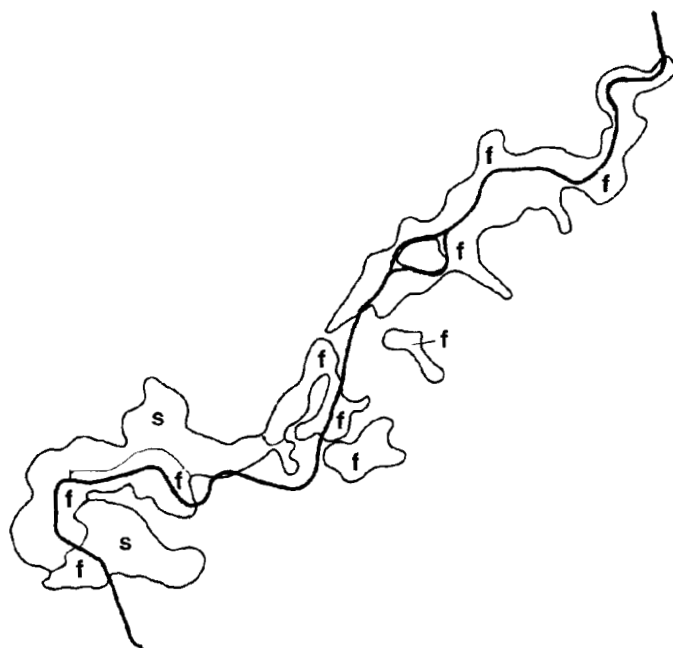
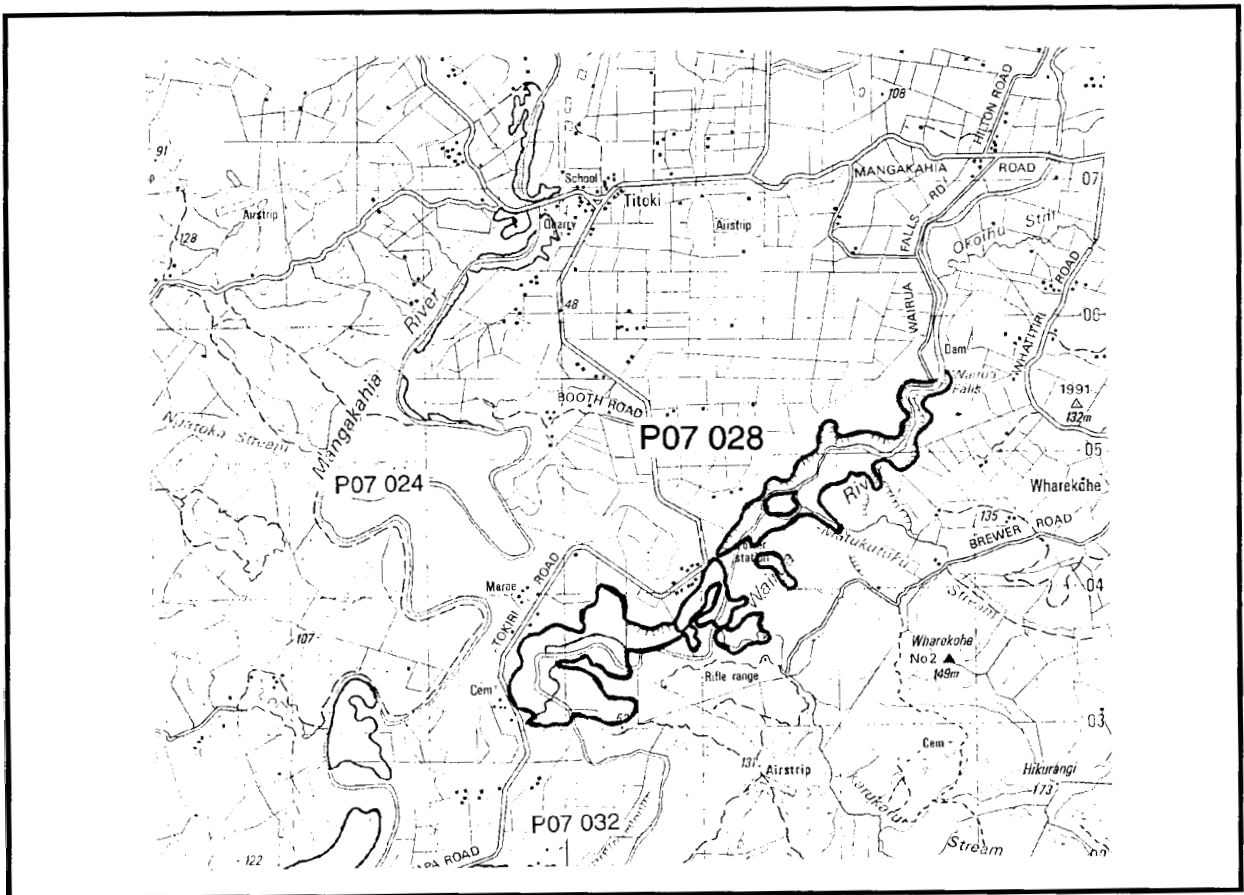


Figure 101. Wairua Falls Scenic Reserve, P07 028  
 Each grid is 1000 m × 1000 m and equals 100 ha.  
 f = forest; s = shrubland.

(h) The remaining riverine forest south of here is kanuka dominant with manatu common. Titoki is less common and totara, kowhai and houhere are also present.

(i) The remaining shrubland area on the eastern side of the river is dominated by tall manuka with totara common. Cabbage tree is also present in low numbers.

#### Significant flora

*Hebe diosmifolia* (Regionally significant species).

Three historical records *Senecio scaberulus* (Carse), *Rorippa divaricata* (1899), and *Hebe acutiflora*.

#### **Fauna**

NI brown kiwi (Category A threatened species), black shag, welcome swallow.

#### **Significance**

This site is the most extensively forested part of the Wairua River and is an excellent example of riverine gorge forest, the only site in the Ecological District where this occurs. All the vegetation types are representative including the only site for kanuka-karaka-tawa riverine forest, tawa-totara riverine forest, **taraire**-titoki riverine forest and manatu-manuka riverine shrubland.

Presence of a threatened bird and a regionally significant flora species.

Seventy-three hectares of the site is protected in a Scenic Reserve administered by the Department of Conservation.

### **DRAFFIN FARM WETLAND**

Survey no.	P07/029
Survey date	3 July 1996
Grid reference	P07 067 008
Area	40.2 ha (7.5 ha wetland, 10.8 ha shrubland, 1.9 ha forest)
Altitude	0-60 m asl

#### **Ecological unit**

- (a) Pacific azolla-duckweed aquatic herbfield in pond
- (b) **Kanuka/manuka**-totara shrubland on moderate hillslope
- (c) Kanuka/manuka shrubland on moderate hillslope
- (d) Willow weed aquatic herbfield in pond
- (e) **Willow weed**-harakeke association in pond
- (f) Kahikatea-manuka-totara forest on wetland edge
- (g) Parrot's feather-willow weed aquatic herbfield in wetland
- (h) *Carex* sedgeland in wetland

#### **Landform/geology**

Quaternary alluvial and swamp deposits.

#### **Vegetation**

A series of man-made ponds and wetlands adjacent to the Wairua River, constructed by the Acclimatisation Society to encourage waterfowl.

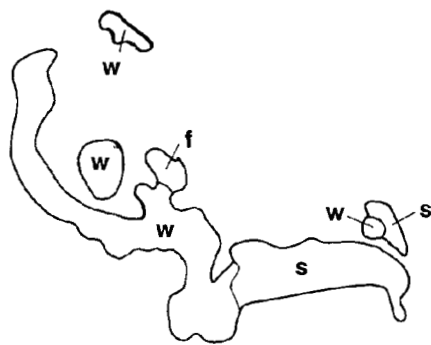
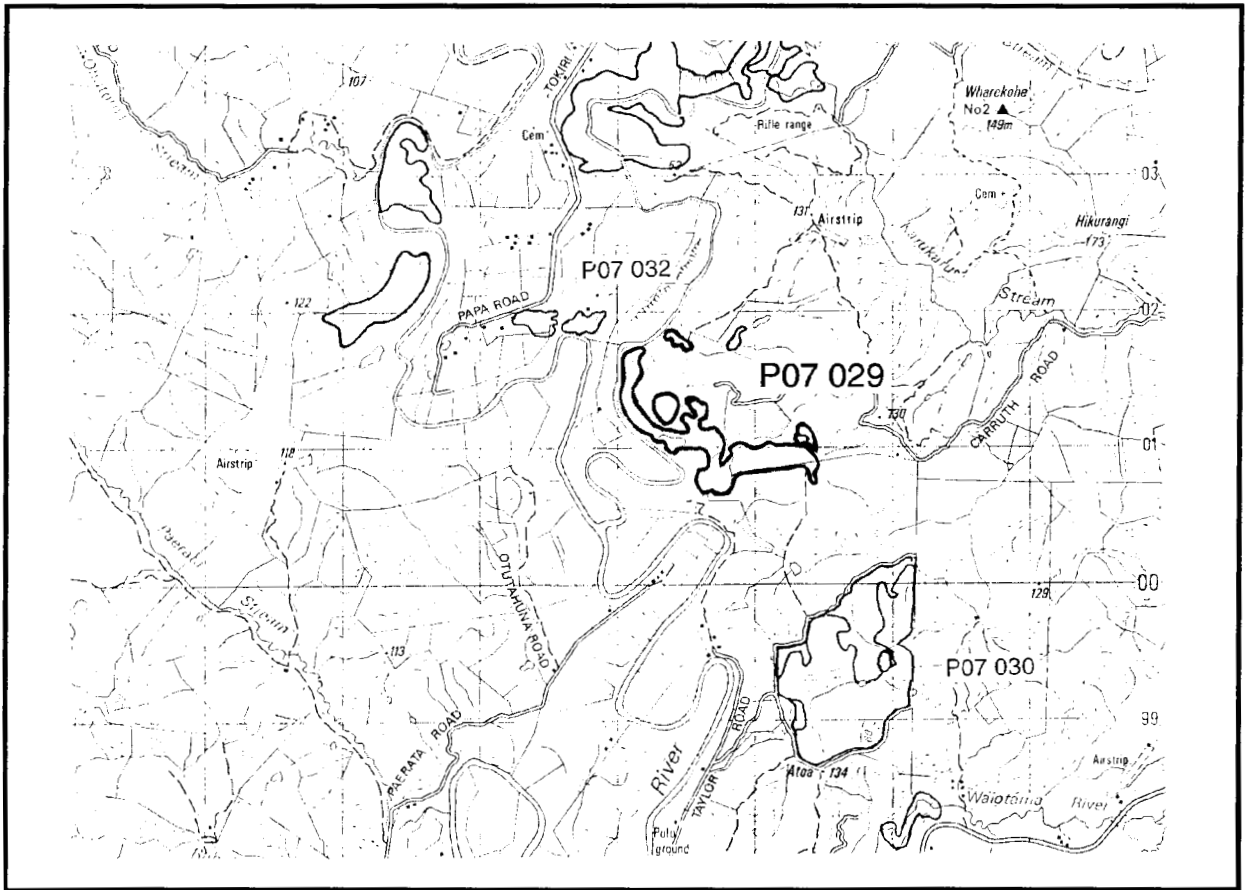


Figure 102. Draffin Farm Wetland, P07 029  
 Each grid is 1000 m × 1000 m and equals 100 ha.  
 f = forest; s = shrubland; w = wetland.

(a) The pond that is located furthest to the east has an inlet and outlet stream and consists of 20% wetland vegetation and 80% open water. On the water surface Pacific azolla is abundant with duckweed common. Also present are occasional *Juncus* sp. and *Carex* sp. Stock have access and the water plants are browsed.

(b) Surrounding this pond is 5–8 metre kanuka/manuka tall shrubland with totara common and tanekaha occasional. This forms a buffer between the pond and the adjacent pine forest.

(c) Between the first and second ponds (towards the river), there is an area of 6–8 metre tall kanuka/manuka shrubland with frequent totara and occasional tanekaha.

(d) The second pond consists of 20% wetland vegetation and 80% open water. Willow weed is dominant with jointed twig-rush, *Carex* sp. and parrot's feather present occasionally. In the middle of the pond there are three small islands, one of which is covered in harakeke. A fringe of manuka encircles the lake.

(e) Between type (d) and the next pond (to the northwest), there is a wetland consisting of 95% wetland vegetation and 5% open water. Willow weed is dominant with harakeke common in planted clumps. Also present are frequent jointed twig-rush, *Juncus* sp. *Carex* sp. and parrot's feather. Stock have access to this area and maimais are dotted around the edge.

(f) On the northern edge of this wetland there is a small area of forest consisting of emergent kahikatea and totara over manuka.

To the west of here another small pond has 95% open water and 5% wetland vegetation (type e). Willow weed is abundant and a small island located in the middle is covered in blackberry. This wetland is surrounded by pasture and is grazed to the edge.

(g) To the west of here and adjacent to the Wairua River is another large pond consisting of 10% wetland vegetation, 15% islands and 75% open water. Parrot's feather and willow weed make up the aquatic vegetation and the islands are covered in blackberry with willow weed, rush sp. and *Carex* sp. less common. The eastern edge of the pond is fringed with manuka.

(h) The pond at the northern edge of the site consists of 60% vegetation with 40% open water. *Carex* sp. is dominant with occasional raupo, jointed twig-rush, *Juncus* sp. and harakeke. Manuka shrubland which borders this pond is, at the time of survey, being cleared to plant pines.

### ***Fauna***

NZ kingfisher, pukeko, paradise duck, Australasian harrier.

Past records of Australasian bittern (Category O threatened species) and white heron (Category O threatened species).

### ***Significance***

Freshwater wetlands are rare within the Ecological District, and despite being artificial, these wetlands are an important habitat for waterfowl.

It is the only site in the Ecological District where Pacific azolla-duckweed association, kahikatea-manuka-totara forest and *Carex* sedgeland have been recorded.

## **WAIOTAMA RESERVE**

Survey no.	P07/030
Survey date	26 June 1996
Grid reference	P07 075 995
Area	100 ha (72 ha forest, 28 ha shrubland)
Altitude	0-100 m asl

### ***Ecological unit***

- (a) Totara forest on hillslope
- (b) Kanuka/manuka shrubland on hillslope
- (c) **Taraire**-totara forest in steep gully
- (d) Kauri forest on steep ridge
- (e) Manuka shrubland on hillslope

### ***Landform/geology***

Mangakahia Complex sandstone and mudstone.

### ***Vegetation***

Waiotama Reserve consists of a forest and shrubland enclave surrounded by pine forest.

(a) The southern part of the site consists of north-facing hillslopes dominated by totara forest. Manuka is frequent with occasional towai, mamaku and lancewood.

(b) The two small areas of shrubland on the western edge of the site are kanuka/manuka shrubland about four metres in height. Also present are totara, kohuhu, mamaku and emergent rimu.

(c) In between the two shrubland areas there is a steep south facing gully dominated by taraire with totara sub-dominant. Towai and rewarewa are frequently present while tawa, rimu, pukatea and kahikatea are occasional.

(d) To the east of here a small area of kauri forest of moderate age is situated on a steep ridge. Totara and emergent rimu are frequent with occasional tanekaha and rewarewa also present.

To the east of here on a south-facing hillslope totara is dominant, type (a), with frequent kahikatea and manuka. Also present in the canopy are rimu, towai and tanekaha.

(e) The shrubland area to the east of this consists of abundant manuka about 5-6 metres tall. Emerging through the canopy is frequent totara while mamaku is also present occasionally.

### ***Fauna***

NI brown kiwi (Category A threatened species), tui, fantail, grey warbler.

Banded kokopu (Category C threatened species).

Kauri snail (Category C threatened species).

### ***Significance***

Waiotama Reserve is a habitat for threatened bird, fish and snail species and forms an important forest enclave within pine forest.

Representative site for all ecological units.

Waiotama Reserve is administered by the Department of Conservation.

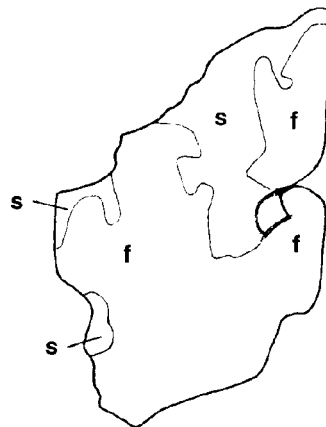
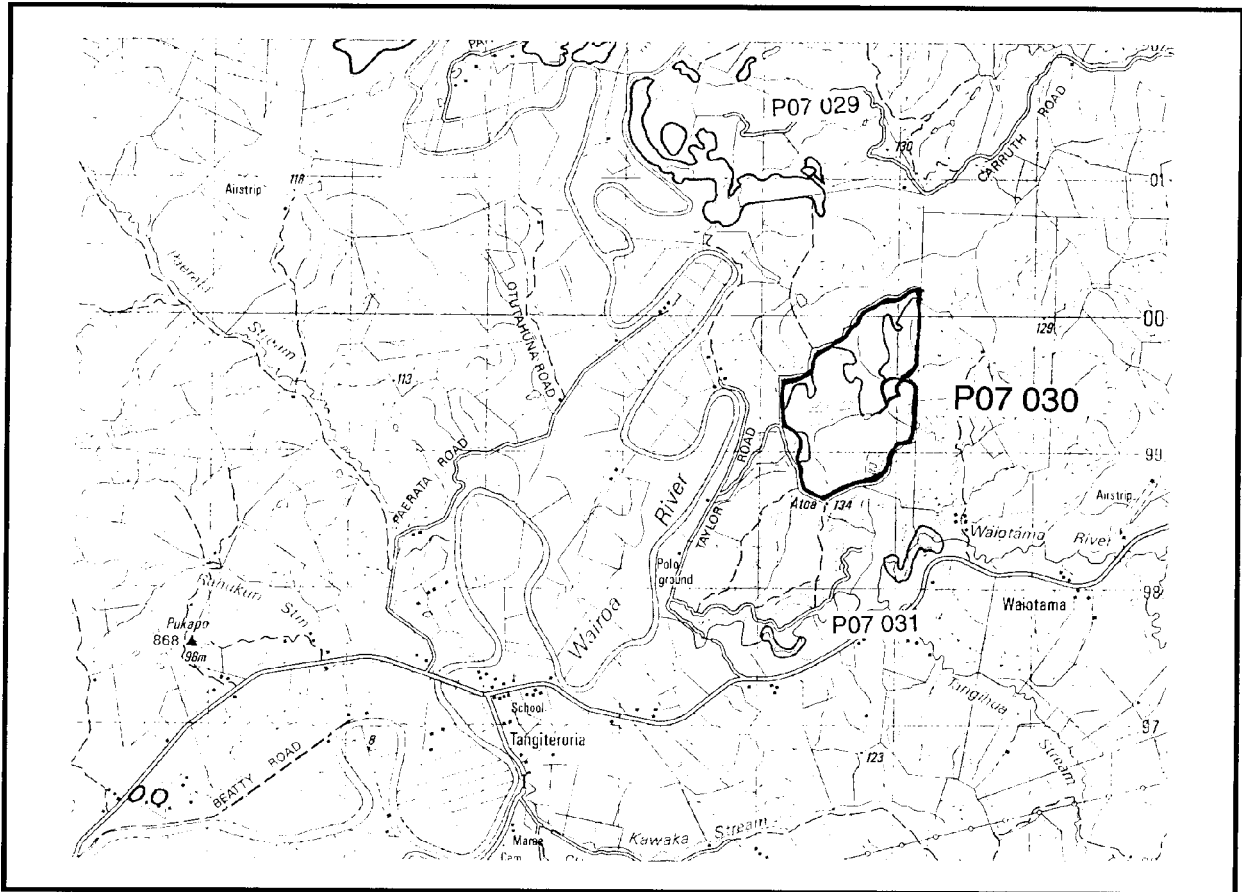


Figure 103. Waiotama Reserve, P07 030  
 Each grid is 1000 m × 1000 m and equals 100 ha.  
 f = forest; s = shrubland.



## **HANHAM'S BUSH**

Survey no.	P07/032
Survey date	21 January 1998
Grid reference	P07 056 019
Area	13.3 ha
Altitude	0-40 m asl

### ***Ecological unit***

- (a) Taraire forest on volcanic flats
- (b) Taraire-totara forest on gentle hillslope
- (c) Kahikatea-totara forest on alluvium

### ***Landform/geology***

Kerikeri Volcanics basaltic lava flow.

### ***Vegetation***

Two small areas of forest adjacent to the Mangakahia River including a volcanic broadleaf remnant and a riverine remnant. Both are fenced and protected as covenants.

- (a) The western remnant contains two forest types including an area of dominant taraire with occasional totara, comprising 20% of the area. One large puriri is present on the edge.
- (b) The remaining area of this remnant comprises taraire-totara forest which has been fenced since 1994. Kahikatea is frequent and there is occasional karaka, pukatea, tanekaha and nikau. At the lower edge of the forest, kowhai, rimu, kawaka and small-leaved milk tree are also present (20%).
- (c) The eastern riverine forest remnant has a fringe of manuka shrubland on its western edge. Kahikatea and totara are common with frequent taraire. Rewarewa is occasional as an emergent and kowhai is present on the riverbank (50%).

### ***Fauna***

NI brown kiwi, reported (Category A threatened species), NI kaka (Category B threatened species), kukupa (Category B threatened species), tui, fantail, silvereve.

### ***Significance***

Examples of protected volcanic broadleaf forest and riverine forest types, both of which are uncommon within the Ecological District. Representative site for taraire forest.

Habitat for threatened bird species including periodic visiting by kaka.

Protected as a Queen Elizabeth II National Trust covenant.

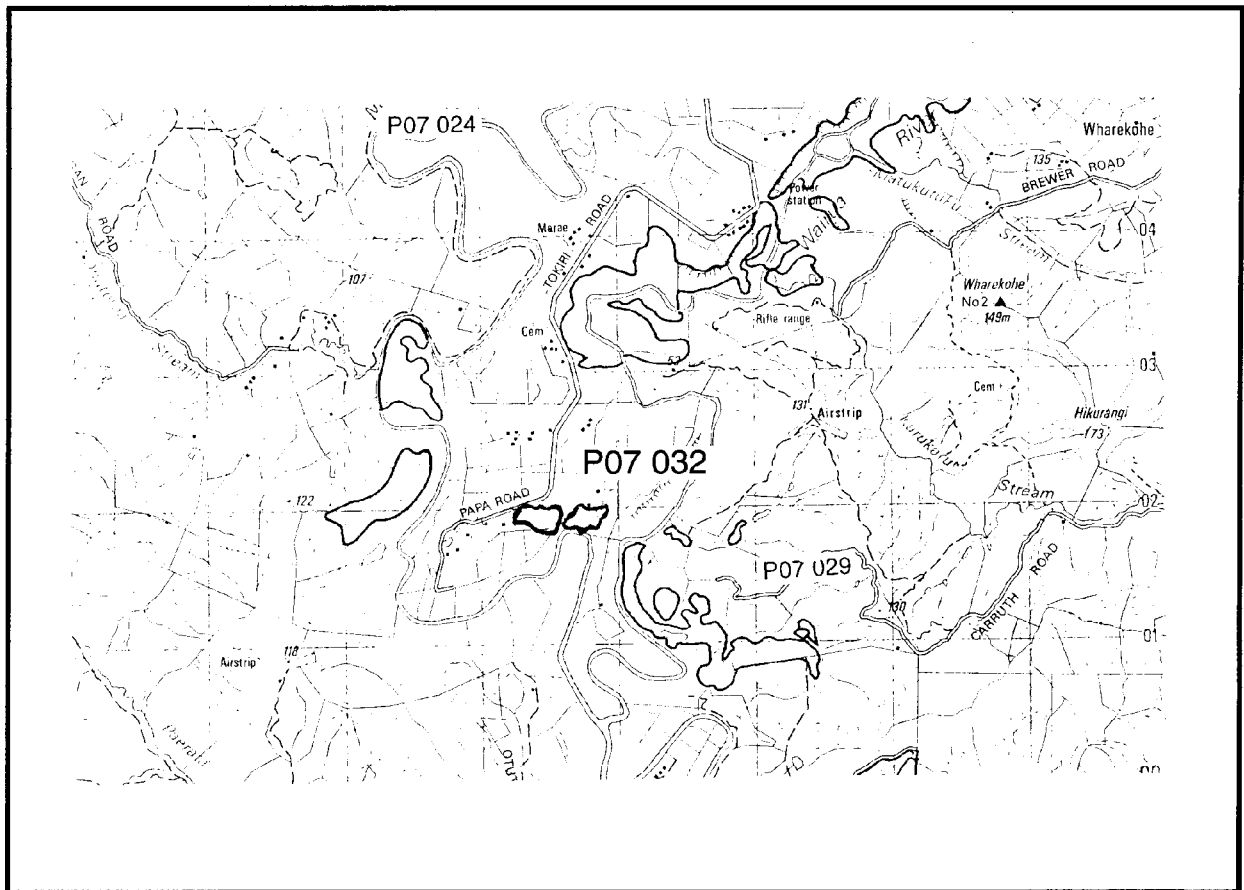


Figure 104. Hanham's Bush, P07 032  
 Each grid is 1000 m × 1000 m and equals 100 ha.  
 f = forest.