

## 4. Site descriptions

Records of threatened flora and fauna have been sourced from herbarium and other databases mentioned in Section 2.1, the Kiwi Recovery Programme (for NI brown kiwi), or from direct observations by Department of Conservation staff during the course of this survey.

The status of all records was checked prior to inclusion in this report. All records included were deemed to be valid as from 1992 or more recent, unless otherwise stated.

Only significant fauna data have been included in these site reports. See Appendix 8.4 for common fauna in the Kaikohe Ecological District.

The percentage cover of ecological units has not been included in some of the site descriptions, where much of the information has been drawn from previous surveys and reports which did not record this.

### 4.1 LEVEL 1 SITES

SITE NAME	SURVEY NO.	GRID REF.
Horeke Road East Bush	O05/076	O05 685 435
Omao Bush	O05/077	O05 680 415
Rurunga Stream Forest	O05/078	O05 665 419
Otautu Stream Headwaters	O05/079	O05 665 435
Wairere Stream Forest Mosaic	O05/080	O05 660 460
Whitecliffs	O05/081	O05 690 470
Whitecliffs Ltd Bush	O05/082	O05 670 487
Pukewhao Forest Mosaic	O05/083	O05 650 485
Carrs/Waimahe Stream Bush	O05/084	O05 625 465
Motukiore Bush Association	O05/085	O05 620 450
Maraeroa Swamps	O05/086	O05 685 508
Moehau Wetland and Forest Mosaic	O05/088	O05 645 410
Taheke River Wetlands	O06/005	O06 683 395
Aratoro Stream Bush	P05/001	P05 810 580
Scotts Road Bush	P05/002	P05 830 570
Otamarangi Stream Bush	P05/003	P05 830 545
Whakanekeneke River Bush	P05/005	P05 805 545
Lake Omapere and Environs	P05/006	P05 830 500
Waikaraka Stream Bush	P05/007	P05 783 575
Waihoanga Stream Forest Outlier	P05/008	P05 775 585
Donaldsons Road Bush	P05/010	P05 755 545
Mihi Road Bush	P05/011	P05 775 535
Okoro Stream Bush	P05/012	P05 735 543
Forest Road Bush	P05/013	P05 733 577
Te Toke Stream Shrubland	P05/014	P05 715 535
Cooks TV Block	P05/015	P05 725 535
Cooks Road Bush No. B	P05/016	P05 743 528
Cooks Airstrip Block	P05/017	P05 735 520
Puriri Farm Bush	P05/018	P05 795 515

SITE NAME	SURVEY NO.	GRID REF.
Okaka Road Wetland	P05/019	P05 712 517
Horeke Road Swamp	P05/020	P05 703 512
Utakura Bush	P05/021	P05 710 500
Waihoanga Bush	P05/023	P05 785 490
Pukewharariki Forest	P05/024	P05 740 460
Guthries Block	P05/025	P05 715 420
Mangatoa Stream Bush	P05/026	P05 769 420
Monument Bush	P05/027	P05 809 435
Waihoanga Road Bush	P05/028	P05 817 459
Reservoir Bush	P05/029	P05 826 457
How Road Bush	P05/030	P05 840 410
Rakautao Bush	P05/031	P05 877 406
Titihuatahu	P05/032	P05 910 430
Ngawha Geothermal Field	P05/033	P05 895 428
Ngawha Swamps	P05/034	P05 885 460
Youngs Kahikatea Remnant	P05/035	P05 873 457
Ngawha Bush	P05/037	P05 878 468
Remuera Settlement Road Remnants	P05/038	P05 863 485
South Omapere Kahikatea Remnant	P05/039	P05 844 491
Waingaruru Stream Swamp	P05/040	P05 900 476
Waitaheke Road Bush	P05/041	P05 902 470
Taumatataraire Stream Bush	P05/042	P05 940 475
Waiaruhe Bush Remnants	P05/043	P05 955 498
Pouerua Cone	P05/044	P05 953 473
Pouerua Bush	P05/045	P05 950 460
Lake Owhareiti and Jacks Lake	P05/046	P05 960 455
Ngawhitu Bush	P05/047	P05 955 440
Kahutoto Stream Remnant	P05/050	P05 970 497
Puketotara/Patukauwae/Te Keene Str. Swamp	P05/064	P05 978 509
Waikaramu Road Bush	P05/066	P05 915 510
Waimate Broadleaf Remnants	P05/067	P05 904 524
Waikuku Road Bush	P05/068	P05 885 525
Bullman Road Broadleaf Remnants	P05/069	P05 858 517
Lake Omapere Swamp Forest Remnant	P05/070	P05 845 511
Wehirua Road Bush	P05/071	P05 846 536
Hui te Werawera Stream Bush	P05/073	P05 880 560
D Cooks Bush	P05/074	P05 925 567
Atkins/Ohaio Bush	P05/075	P05 936 560
Tauanui Volcanic Lake and Environs	P06/007	P06 890 330
Tauanui Volcanic Broadleaf Remnant	P06/008	P06 891 346
Punakitere Valley Swamp Forest	P06/010	P06 882 368
Kaipaha Swamp	P06/018	P06 780 340
Punakitere/Ninihi Road Bush	P06/019	P06 753 350
Korowhata Stream Pond	P06/080	P06 828 371
Mangatoa/Punakitere Riverine	P06/086	P06 730 378
Tautoro Wetland	P06/088	P06 868 352
Whakaruangangana Gumfield	P06/089	P06 800 395
Karakamatamata Scenic Reserve	P06/091	P06 724 390

## **HOREKE ROAD EAST BUSH**

Survey no.	O05/076
Survey date	24 May 1994
Grid reference	O05 685 435
Area	292.6 ha (forest 194.6 ha; shrubland 98 ha)
Altitude	20-245 m asl

### ***Ecological unit***

- (a) Manuka-totara-tanekaha shrubland on hillslope (c. 30%)
- (b) Kahikatea-taraire forest on hillslope (c. 10%)
- (c) Puriri-karaka-kowhai forest on rock outcrop (c. 5%)
- (d) Nikau-kahikatea-taraire forest on hillslope (c. 20%)
- (e) Puriri-totara-kahikatea forest on hillslope (c. 25%)
- (f) Kahikatea forest on hillslope (c. 5%)
- (g) Manuka shrubland on hillslope (5%)

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

Steeply dissected hill country underlain by Tangihua Complex igneous rocks in the north with the remainder in Mangakahia Complex sandstone and mudstone.

### ***Vegetation***

A large secondary and heavily cutover forest mosaic which is linked by plantation forestry to the large Pukewharariki block (P05/024).

Type (a) Manuka-totara-tanekaha shrubland to six metres contains frequent kauri and *Hakea* sp. with occasional rimu, cabbage tree and mamaku. Towai is occasional to frequent.

NB Approximately 15 ha of this type was cleared in 1997.

Type (b) Kahikatea-taraire forest includes frequent manuka, puriri, towai and rewarewa with occasional rimu and northern rata.

Type (c) Puriri-karaka-kowhai forest occurs at O05 694 436.

Type (d) Nikau-kahikatea-taraire forest includes puriri, manuka and totara with occasional pukatea, northern rata and rewarewa.

Type (e) Puriri-totara-kahikatea forest includes rewarewa with occasional pukatea, northern rata and rimu.

Type (f) Kahikatea forest - tall secondary forest occurring on the south east corner, with frequent taraire, pukatea and totara and occasional titoki, rimu and kohekohe.

Type (g) Manuka shrubland - occurs on the southern tip, with occasional cabbage tree, totara and gorse.

### ***Fauna***

NI brown kiwi (Category A threatened species), while not confirmed within this site, are known to be present in contiguous forest to the north-east and it is likely that they occur here also.

### ***Significance***

The large puriri component may be important as a seasonal food source to kukupa which, in other parts of Northland, are known to target puriri fruit in the summer months.

Figure 3. Horeke Road East Bush, O05/076

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

s = shrubland; f = forest.

The site contains several vegetation types not well-represented in the Ecological District. It is a representative site for types (a), being a large area of dense and vigorous regeneration, and (e), also by far the largest area of its type; the only site in the Ecological District of types (c) and (d); and one of the largest sites for type (f).

An upper catchment/riparian protection function is implied, as well as a refuge function for forest species during harvest of adjoining pines.

## **OMAO BUSH**

Survey no.	O05/077
Survey date	24 May 1994
Grid reference	O05 680 415
Area	52.3 ha (forest 25.3 ha; shrubland 27 ha)
Altitude	20-134 m asl

### ***Ecological unit***

- (a) Towai-taraire forest on hillslope (40%)
- (b) Kahikatea-totara-manuka forest on hillslope (40%)
- (c) Manuka shrubland on hillslope (20%)

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

Occurs on a Kerikeri basalt flow remnant including talus slope and ridge crest merging with Mangakahia Complex sandstone on the lower hillslopes.

### ***Vegetation***

Secondary and cutover forest remnant with peripheral shrubland.

Type (a) - Towai-taraire forest with frequent totara, kanuka, puriri, rewarewa with occasional pukatea, rimu and northern rata.

Type (b) - Kahikatea-totara-manuka forest includes frequent tanekaha with occasional rimu.

Type (c) - Manuka shrubland - a regenerating area with locally common secondary kahikatea, gorse, tanekaha, and bracken with frequent *Hakea* sp. Also present are cabbage tree, pampas, and occasional matai, small-leaved milk tree, Smith's tree fern, *Coprosma rigida* and *Coprosma rotundifolia*.

### ***Fauna***

Kauri snail (Category C threatened species).

### ***Significance***

Presence of kauri snail.

The assemblage of plant species within the regenerating manuka is of botanical interest due to the presence of Smith's tree fern, usually found at higher altitudes and in wetter areas of Northland, and three species of divaricating shrubs of scattered distribution in Northland.

Part of a stepping stone linkage, which exists between the large forest blocks of Waima and Pukewharariki. A portion of the site buffers a watercourse.

Figure 4. Omao Bush, O05/077  
Each grid is 1000 m × 1000 m and equals 100 ha.  
s = shrubland; f = forest.

## **RURUNGA STREAM FOREST**

Survey no.	O05/078
Survey date	24 May 1994
Grid reference	O05 665 419
Area	46 ha (forest 36.2 ha; shrubland 7.8 ha, wetland 2 ha)
Altitude	<20 m asl

### ***Ecological unit***

- (a) Kanuka-kowhai forest on alluvium (35%)
- (b) Manuka/kanuka-totara forest on hillslope (c. 60%)
- (c) Raupo reedland in swamp (5%)

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

Two small forest and wetland remnants separated only by Moehau Road. The larger of the two occurs on rolling hill country underlain by Mangakahia Complex sandstone.

### ***Vegetation***

- (a) Kanuka-kowhai forest

The alluvial riparian forest is suffering the effects of stock grazing but retains areas of relative intactness. Associated species here include kahikatea, *Muehlenbeckia australis* with occasional titoki, NZ passion flower, flax, cabbage tree and lacebark.

- (b) Manuka/kanuka-totara forest

Secondary forest adjoining the wetland contains frequent tanekaha and kahikatea.

- (c) A small (c. 3 ha) raupo dominant wetland borders Horeke Road. Other species associated with the wetland include cabbage tree, nikau, manuka and occasional kahikatea, mapou and *Coprosma propinqua*.

### ***Fauna***

NI fernbird (regionally significant) is present within the freshwater wetland.

### ***Significance***

Includes representation of two uncommon and declining habitat types - those of mineralised freshwater wetlands and riparian alluvial forest. It is the only site in the Ecological District for type (a) and a representative example of type (c).

Presence of fernbird.

A riparian protection function is implied.

Figure 5. Rurunga Stream Forest, O05/078  
Each grid is 1000 m × 1000 m and equals 100 ha.  
s = shrubland; f = forest; w = wetland.



## **OTAUTU STREAM HEADWATERS**

Survey no.	O05/079
Survey date	24 May 1994
Grid reference	O05 655 435
Area	166.8 ha (forest 105.6 ha; shrubland 61.2 ha)
Altitude	<20 m-120 m asl

### ***Ecological unit***

- (a) Taraire-puriri forest on hillslope (60%)
- (b) Manuka/kanuka-totara forest on hillslope (25%)
- (c) Manuka/kanuka-towai forest on hillslope (15%)

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

Dissected hill country underlain by Mangakahia Complex sandstone.

### ***Vegetation***

A secondary and cutover forest remnant. Associated canopy species include:

Type (a) Taraire-puriri forest - towai, rewarewa, kahikatea, nikau with occasional rimu, northern rata, pukatea, kawaka, miro, tawa, totara and kohekohe.

Type (b) Manuka/kanuka-totara - towai, tanekaha and occasional puriri.

Type (c) Manuka/kanuka-towai forest - emergent rimu and kahikatea with occasional tawa, totara and emergent kauri and northern rata.

### ***Fauna***

Kukupu (Category B threatened species).

### ***Significance***

Habitat for kukupa.

The dominant forest type (taraire-puriri) is known to be a preferred kukupa feeding habitat type, able to retain pigeons year-round. It is the largest area of taraire-puriri forest in the Ecological District on Mangakahia sandstone and this type exhibits a wide diversity of canopy species.

Type (c) is one of only three examples of its type in the Ecological District and has the most diverse canopy.

The site exhibits a substantial emergent element, now uncommon in the Ecological District.

An upper catchment/riparian protection and refuge function during the harvest of adjoining pines is implied.

Figure 6. Otautu Stream Headwaters, O05/079  
Each grid is 1000 m × 1000 m and equals 100 ha.  
s = shrubland; f = forest.

## WAIRERE STREAM FOREST MOSAIC

Survey no.	O05/080
Survey date	19 May 1994
Grid reference	O05 660 460
Area	314.3 ha (forest 170 ha; shrubland 144.3 ha)
Altitude	20-190 m asl

### *Ecological unit*

- (a) Manuka/kanuka shrubland on hillslope (30%)
- (b) Towai-tanekaha forest on hillslope (5%)
- (c) Manuka/kanuka-tanekaha forest on hillslope (20%)
- (d) Kanuka-taraire forest on hillslope (10%)
- (e) Manuka/kanuka-towai forest on hillslope (5%)
- (f) Towai-taraire forest on hillslope (30%)

### *Landform/geology*

Underlain by predominantly dissected sandstone hill country with Kerikeri volcanic basalt remnants and basalt talus at the northern end. Mangakahia Complex siliceous mudstone is also present in the Okakari Stream valley.

### *Vegetation*

A large cutover and secondary forest remnant, exhibiting a mosaic of vegetation types linked together with shrubland.

Associated canopy species include:

Type (a) Manuka/kanuka shrubland - occasional gorse and mingimingi.

Type (b) Towai-tanekaha forest - kanuka, taraire, emergent rimu and occasional emergent northern rata and kauri.

Type (c) Manuka/kanuka-tanekaha - totara, towai and occasional whau.

Type (d) Kanuka-taraire forest - tanekaha, towai, rewarewa with occasional totara, nikau, puriri, northern rata and kawaka. Occurs at O05 653 457.

Type (e) Manuka/kanuka-towai forest - rewarewa and kahikatea.

Type (f) Towai-taraire forest - rewarewa, totara, tanekaha, northern rata with occasional kanuka, kauri, kawaka, kahikatea, rimu, miro and puriri. Occurs at O05 661 456.

Significant flora

Kawaka and whau (sparse distributions in Northland).

### *Fauna*

NI brown kiwi (Category A threatened species) (P. Miller 1992).

Kukupa (Category B threatened species).

### *Significance*

The largest remaining portion of a once-extensive shrubland/secondary forest mosaic which extended from the large Pukewharariki Forest tract in the east, to Pukewhao/Horeke in the west. This remnant is still linked to Pukewharariki and other small remnants by plantation forest and is well placed to perform a significant refuge function during logging. An upper catchment/riparian protection function is implied.

Figure 7. Wairere Stream Forest Mosaic, O05/080

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

s = shrubland; f = forest.

Habitat for kukupa and kiwi.

An important representative site, with types (c) and (d) being one of only two sites within the Ecological District, and types (b) and (e), each being one of only three examples; also a representative site for types (a) and (f), the latter being a large area exhibiting a diversity of canopy species.

A large emergent rata component, uncommon in Northland, exists in the Okarari catchment.

Two regionally significant plant species present.

## **WHITECLIFFS**

Survey no. O05/081  
Survey date 24 May 1994  
Grid reference O05 690 470  
Area 69.9 ha (forest 53.3 ha; shrubland 16.6 ha)  
Altitude 180-220 m asl

### ***Ecological unit***

(a) Manuka/kanuka-towai-kauri forest on hillslope

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

Dissected hill country underlain by Mangakahia Complex sandstone.

Figure 8. Whitecliffs, O05/081

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

s = shrubland; f = forest.

### ***Vegetation***

Two closely associated remnant forest areas which, until recently, were linked. However, the 80 ha area identified as a SSBI in 1978 has partially been converted to *Pinus radiata*, effectively splitting the habitat in two.

Associated canopy species include: puriri, tanekaha and emergent northern rata.

### ***Fauna***

NI brown kiwi (Category A threatened species) were present in 1978 and it is likely that they are still present.

### ***Significance***

The area is linked by plantation forest to the large Pukewharariki block to the east and to other small remnants to the west.

It is the only example of this vegetation type in the Ecological District.

An upper catchment/riparian protection and refuge function during logging of adjoining pines is implied.

Habitat for NI brown kiwi.

## **WHITECLIFFS LTD BUSH**

Survey no.	O05/082
Survey date	19 May 1994
Grid reference	O05 670 487
Area	51.4 ha
Altitude	100-220 m asl

### ***Ecological unit***

- (a) Kanuka-tanekaha-towai forest on hillslope (80%)
- (b) Totara-taraire-puriri forest on hillslope (20%)

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

Underlain by Kerikeri volcanic basalt remnant forming the upper slopes and Mangakahia Complex sandstone with some basalt talus downslope.

Figure 9. Whitecliffs Ltd Bush, O05/082

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

### ***Vegetation***

Secondary and cutover forest on a steep north face. Associated canopy species include:

Type (a) Kanuka-tanekaha-towai forest - totara, rimu, kahikatea and rewarewa with occasional emergent northern rata.

Type (b) Totara-taraire-puriri forest - rewarewa with emergent northern rata.

### ***Fauna***

Both kukupa (Category B threatened species) and NI brown kiwi (Category A threatened species) have been recorded from within this forest, as well as common forest birds.

### ***Significance***

Contains a considerable emergent northern rata element, which is still generally in good health, an uncommon situation in Northland.

It is the only example recorded in the Ecological District of type (a).

Habitat for kukupa and kiwi.

Provides upper catchment protection and refuge function for kiwi during logging operations in the adjacent production forest.

## **PUKEWHAO FOREST MOSAIC**

Survey no.	O05/083
Survey date	19 May 1994
Grid reference	O05 650 485
Area	238.7 ha (forest 133.2 ha; shrubland 105.5 ha)
Altitude	0-215 m asl

### ***Ecological unit***

- (a) Manuka/kanuka shrubland on hillslope (40%)
- (b) Towai-tanekaha forest on hillslope (20%)
- (c) Manuka/kanuka-tanekaha forest on hillslope (40%)

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

A Kerikeri volcanic basalt plateau remnant in the vicinity of Pukewhao Trig with highly dissected Mangakahia Complex siliceous mudstone hill country to the west and north.

Figure 10. Pukewhao Forest Mosaic, O05/083

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

s = shrubland; f = forest.



### ***Vegetation***

A secondary forest/shrubland mosaic. Associated canopy species include:

Type (a) Manuka/kanuka shrubland - occasional gorse and mingimingi.

Type (b) Towai-tanekaha forest - kanuka, taraire and emergent rimu with occasional emergent northern rata and kauri.

Type (c) Manuka/kanuka-tanekaha forest - totara and towai with occasional whau.

Significant flora

Whau, an uncommon plant with limited distribution in Northland.

### ***Fauna***

Not surveyed.

### ***Significance***

The site has coastal riparian values as it adjoins the Wairere River estuary and the Hokianga Harbour proper. This coastal element is indicated by the presence of whau (regionally significant).

An upper catchment/riparian protection function is implied.

It is one of only two sites within the Ecological District of type (c), and one of only three sites of type (b).

## **CARRS/WAIMAHE STREAM BUSH**

Survey no.	O05/084
Survey date	25 May 1994
Grid reference	O05 625 465
Area	128.5 ha
Altitude	0-160 m asl

### ***Ecological unit***

(a) Taraire-totara-kauri-tanekaha forest on hillslope (20%)

(b) Kanuka-totara-tanekaha forest on hillslope (15%)

(c) Kanuka-totara-taraire forest on hillslope (15%)

(d) Manuka shrubland on hillslope (45%)

(e) Kahikatea forest on alluvium (5%)

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

On dissected hill country underlain by Mangakahia Complex sandstone.

### ***Vegetation***

Cutover and secondary forest remnant with peripheral shrubland. *Pinus radiata* plantation forest is being planted adjoining these blocks which will provide a link between these and other remnant forests between Horeke and Moehau.

Types (a) and (b) occur in the small eastern block.

Types (c), (d) and (e) occur in the larger western block.

Type (a) Taraire-totara-kauri-tanekaha forest - puriri, kanuka, rewarewa and emergent kahikatea with occasional emergent rimu, miro and northern rata.

Type (b) Kanuka-totara-tanekaha forest - occasional puriri, rewarewa, towai and emergent rimu and northern rata (also present in the western block).

Type (c) Kanuka-totara-taraire forest - towai, rewarewa, tanekaha and emergent rimu and kahikatea with occasional tawa and emergent kauri and northern rata.

Type (d) Manuka shrubland - occasional tanekaha.

Type (e) Kahikatea forest - totara and kowhai. Occurs on the flats adjoining the Perunui River.

### ***Fauna***

NI brown kiwi (Category A threatened species) and kauri snail (Category C threatened species) reported (1994).

### ***Significance***

This site contains the only examples in the Ecological District of types (a) and (c). Type (e), kahikatea forest on alluvium, is an uncommon vegetation type in the Ecological District and Region.

Contains a considerable emergent element, an uncommon feature in the Ecological District.

Habitat for two threatened species.

Some riparian protection values are implied.

Figure 11. Carrs/Waimahe Stream Bush, O05/084

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

## MOTUKIORE BUSH ASSOCIATION

Survey no.	O05/085
Survey date	25 May 1994
Grid reference	O05 620 450
Area	420 ha (forest 166 ha; shrubland 250 ha; wetland 4 ha)
Altitude	20-183 m asl

### *Ecological unit*

- (a) Kanuka-totara-tanekaha forest on hillslope
- (b) Taraire-kanuka forest on hillslope
- (c) Taraire-totara-kahikatea forest on hillslope
- (d) Manuka/kanuka-mahoe shrubland on hillslope
- (e) Manuka/kanuka shrubland on hillslope
- (f) Raupo-*Calystegia* sp. association in swamp
- (g) Gorse scrub on hillslope

### *Landform/geology*

The total area constitutes a large remnant mosaic on dissected hill country underlain by Mangakahia Complex sandstone with small freshwater wetlands in some valleys particularly the Waiwhao Stream.

### *Vegetation*

Several small areas of remnant cutover and secondary forest linked by fire induced shrubland tending to the ridges. Associated canopy species include:

Type (a) Kanuka-totara-tanekaha forest - emergent rimu with occasional puriri, rewarewa and emergent kahikatea.

Type (b) Taraire-kanuka forest - totara, puriri, rewarewa, nikau with occasional pukatea, tawa, titoki and northern rata.

Type (c) Taraire-totara-kahikatea forest - tanekaha, towai, kanuka, rewarewa, emergent rimu and occasional, pukatea, kawaka, miro, puriri, tawa, titoki and emergent kauri.

Type (d) Manuka/kanuka-mahoe shrubland - kowhai, cabbage tree, lacebark, gorse and occasional nikau.

Type (e) Manuka/kanuka shrubland - to eight metres tall with scattered totara and kahikatea

Type (f) Raupo-*Convolvulus* wetland

Type (g) Gorse scrub - frequent manuka and occasional pampas.

This site is part of a larger area of contiguous vegetation, much of which comprises gorse and tobacco weed. Only that shrubland and scrub providing a direct linking or buffering function has been identified, but the additional scrubland may be of value and may harbour kiwi.

### *Fauna*

NI brown kiwi (Category A threatened species), kukupa (Category B threatened species). The small swamp rail, the spotless crane, is present in high numbers within the wetland (regionally significant).

Figure 12. Motukiore Bush Association, O05/085

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

s = shrubland; f = forest; w = wetland.

### ***Significance***

Large size and contains representation of an uncommon ecosystem - fertile freshwater wetlands.

Type (b) is represented at only two sites in the Ecological District, and type (c) at only four sites. At this site type (c) exhibits a diversity of other species present.

A representative site of type (d) which is not common in Northland and not represented in the protected areas network.

Habitat for threatened and regionally significant fauna.

A riparian protection function is implied.

## **MARAEROA SWAMPS**

Survey no. O05/086  
Survey date 2 June 1994  
Grid reference O05 685 508  
Area 6.5 ha  
Altitude < 5 m asl

### ***Ecological unit***

- (a) Raupo reedland in swamp
- (b) *Apodasmia* sedgeland in swamp
- (c) Kahikatea-kanuka forest on alluvium

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

Alluvial and estuarine deposits.

### ***Vegetation***

This site comprises two small remnant wetlands within the Lower Uakura River valley (a third wetland also identified in 1978 and registered as a SSBI has since been drained, reducing the total area by c. 9 hectares). They do not appear to be grazed. Exotic shrubland borders both, but the wetlands are not currently under threat from weeds.

Figure 13. Maraeroa Swamps, O05/086  
Each grid is 1000 m × 1000 m and equals 100 ha.  
w = wetland.

Associated species include:

Type (a) Raupo reedland - occasional flax.

Type (b) *Apodasmia* sedgeland - raupo and occasional cabbage tree.

Type (c) Kahikatea-kanuka forest - pukatea, cabbage tree and occasional swamp maire.

### ***Fauna***

Spotless crane (regionally significant).

### ***Significance***

Representative of two rare and diminishing ecosystems - mineralised freshwater wetlands (type (a)) and alluvial swamp forest. It is the only site in the Ecological District of types (b) and (c).

Habitat for spotless crane, a regionally significant species.

## **MOEHAU WETLAND AND FOREST REMNANT**

Survey no.	O05/088
Survey date	2 August 1994
Grid reference	O05 645 410
Area	120.2 ha (forest 59.8 ha; shrubland 12.6 ha; swamp shrubland 19.8 ha; swamp forest 29 ha)
Altitude	0-155 m asl

### ***Ecological unit***

(a) Kauri-tanekaha forest on hillslope (10%)

(b) Towai forest on hillslope (30%)

(c) *Coprosma propinqua*-*Coprosma rigida*-*Bolboschoenus* swamp shrubland on alluvium (10%)

(d) Kowhai-*Coprosma propinqua*-*Gabnia* swamp forest on alluvium (20%)

(e) Manuka shrubland on hillslope (30%)

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

Estuarine deposits and dissected hill country underlain by Mangakahia Complex sandstone.

### ***Vegetation***

Approximately 50% of this site is secondary and cutover forest. The remainder is in modified brackish marsh, alluvial shrubland and alluvial swamp forest remnant.

Canopy species associated with the forest types include:

Type (a) Kauri-tanekaha forest - manuka and taraire.

Type (b) Towai forest - occasional totara, hinau, rimu, tawa, puriri and taraire.

Type (c) *Coprosma propinqua*-*Coprosma rigida*-*Bolboschoenus* swamp shrubland - *Carex* sp. and *Cyperus* sp. with occasional swamp maire, cabbage tree, kahikatea, putaputaweta and *Muehlenbeckia australis*.

Figure 14. Moehau Wetland and Forest Remnant, O05/088

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

s = shrubland; f = forest; w = wetland.

Type (d) Kowhai-*Coprosma propinqua*-*Gabnia* swamp forest - pampas and *Cyperus ustulatus* with occasional kahikatea, *Muehlenbeckia complexa*, manuka, broom and flax.

### ***Fauna***

Faunal values are largely unknown, but include common forest birds.

### ***Significance***

Despite being modified by stopbanks and internal drainage, which has encouraged a significant invasive weed problem (pampas and gorse), the site remains one of the few within this Ecological District which exhibit altitudinal gradients from hill country (155 m asl) through to the coastal marine area.

It also contains two wetland vegetation types which are rare in Northland - *Coprosma propinqua*-*Coprosma rigida*-*Bolboschoenus* swamp shrubland and Kowhai-*Coprosma propinqua*-*Gabnia* swamp forest on alluvium (20%) and which are the only examples of their type in the Ecological District.

## TAHEKE RIVER WETLANDS AND RIVERINE FOREST

Survey no. O06/005  
Survey date 2 May 1994  
Grid reference O06 683 395  
Area 24.5 ha approximately (9.5 ha wetland; 15 ha forest)  
Altitude < 20 m asl

### *Ecological unit*

- (a) Raupo reedland in swamp
- (b) Manuka shrubland on alluvium
- (c) Manuka/kanuka-totara forest on alluvium and hillslope

Figure 15. Taheke River Wetlands and Riverine Forest, O06/005

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

f = forest; w = wetland.



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

Two small fertile freshwater wetlands about one kilometre apart adjacent to the lower Taheke River and situated on an irregular surfaced Taheke basalt flow.

### ***Vegetation***

The wetlands include as associated species occasional cabbage tree and flax, with the manuka dominant periphery being shared with totara and occasional wattle, tanekaha and crack willow.

The riverine forest adjoins the northern wetland and comprises a narrow strip about a kilometre in length, grading into low manuka and discontinuous vegetation.

It contains frequent taraire and kahikatea, as well as karaka, puriri, pukatea, rewarewa, rimu, matai, kauri, black wattle, Chinese privet, kowhai, nikau, kiekie, cabbage tree, with flax along the river margin.

### ***Fauna***

Not surveyed.

### ***Significance***

Sites such as these where a freshwater wetland abuts a saline or brackish vegetation type and riverine forest have been reduced to near extinction within the Hokianga Harbour.

Represents a rare and diminishing habitat type, both within this Ecological District and nationally.

## **ARATORO STREAM BUSH**

Survey no.	P05/001
Survey date	27 May 1994
Grid reference	P05 810 580
Area	664.7 ha (forest 257.7 ha; shrubland 407)
Altitude	80-314 m asl

### ***Ecological unit***

- (a) Manuka shrubland on plateau (30%)
- (b) Kanuka-towai forest on hillslope (25%)
- (c) Towai forest on hillslope (5%)
- (d) Taraire-puriri forest on hillslope (20%)
- (e) Manuka-totara-tanekaha forest on hillslope (20%)

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

The site has a very complex geomorphology which includes Kerikeri volcanics basalt flow and talus on the escarpments and hillslopes to the north of Aratoro Stream, Akarana supergroup massive to flaggy calcareous mudstone with sandstone beds in the Porotekoitiamo Stream area, and Mangakahia Complex sandstone and mudstone lithofacies north and south of Aratoro Stream with siliceous mudstone in the valley. The deeply incised valleys and intervening ridges have been cut into the sedimentary rocks of these latter groups.

Figure 16. Aratoro Stream Bush, P05/001

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

s = shrubland; f = forest.

### ***Vegetation***

A large area of shrubland/gumland and secondary forest on the edge of a Kerikeri basalt plateau remnant with small cutover forest pockets within deeply incised valleys forming a large forest outlier to Puketi Forest.

Associated species include:

Type (a) Manuka dominated gumland with frequent mingimingi, *Dracophyllum* sp., umbrella fern, kumerahou, *Schoenus* sp. and occasional *Hakea* sp. within gum digging induced shrubland.

Type (b) Kanuka-towai forest - kahikatea, tanekaha, totara, taraire, mamaku and rewarewa are frequent with occasional rimu, puriri, titoki, kauri and northern rata.

Type (c) Towai forest - rewarewa, mamaku tree fern with occasional manuka, rimu, puriri and taraire.

Type (d) Taraire-puriri forest - kahikatea, towai, rewarewa, nikau, hinau, tanekaha and totara with occasional kauri, kawaka, miro, northern rata, kohekohe and tawa.

Type (e) Manuka-totara-tanekaha forest - occasional rimu and kahikatea.

#### Significant flora

At least 18 species of orchid have been recorded including *Caladenia atradenia* (Naturally Uncommon - Sparse).

#### ***Fauna***

High numbers of NI fernbird (regionally significant) are present within the gumland.

NI brown kiwi (Category A threatened species), 4-5 pairs present in the Puketi Scenic Reserve in 1997 (I. Wilson pers. comm.) and extend into the older growth forest of the valleys.

Kukupa (Category B threatened species), pied tit (regionally significant).

Australasian bittern (Category O threatened species) (SSBI 1979) and brown teal (Category C threatened species) (1987) also recorded within the site.

#### ***Significance***

An important representative site with a diversity of rock and vegetation types, and containing representation of a rare and diminishing vegetation type - gumland. It is the only example of type (b) in the Ecological District and one of only 2 examples of type (a).

The gumland vegetation of the plateau is notable for its diversity of native orchids (> 10 species).

Habitat for several threatened and regionally significant flora and fauna.

Brown teal formerly present, and as a released population is located to the north of this site, could re-establish here.

Its large size contributes to catchment/riparian protection.

Aratoro is a soil site of national importance:

- (i) contains a moderate range of little-disturbed soil-native vegetation associations,
- (ii) is an excellent example of a leaching sequence of brown loams,
- (iii) is the only example of Ruatangata soils in national and regional inventory,
- (iv) is a good example of uncommon Hihi, Waiotu, Taumata-Okaihau soils (Arand et al. 1993).

Approximately 463 ha of this forest block are administered by the Department of Conservation, including 54 ha of scenic reserve and 28 ha of stewardship land comprising the Puketi Scenic Reserve in the north of the site. To the south of this reserve approximately 200 ha of freehold land separates it from the 380 ha Aratoro stewardship block.

## SCOTTS ROAD BUSH

Survey no. P05/002  
Survey date 27 May 1994  
Grid reference P05 830 570  
Area 200 ha  
Altitude 140-280 m asl

### *Ecological unit*

- (a) Totara-kahikatea-taraire forest on hillslope
- (b) Totara-kahikatea-towai forest on alluvial plain and gentle hillslope (Kingett-Mitchell)
- (c) Towai-kanuka-rewarewa forest on hillslope
- (d) Towai-totara forest on hillslope
- (e) Towai-tawa forest on gully sides
- (f) Towai-taraire forest on hillslope
- (g) Secondary totara forest on volcanic flats and gentle hillslope (<5%)
- (h) Kauri-rimu forest on volcanic flat and hillslope (<1%)
- (i) Kahikatea forest on volcanic flats (c. 5%)

Figure 17. Scotts Road Bush, P05/002  
Each grid is 1000 m × 1000 m and equals 100 ha.  
f = forest.

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

Valley system is underlain by Mangakahia Complex micaceous sandstone and siliceous mudstone deeply incised into the plateau of Kerikeri volcanic basalt lava and talus escarpments.

### ***Vegetation***

A cutover and secondary forest remnant within the upper Whakanekeneke River valley. Associated canopy species include:

Type (a) Totara-kahikatea-taraire forest - puriri, rewarewa, northern rata, nikau, towai are frequent, and occasional matai, rimu, tawa, pukatea, tarata and kohuhu.

Type (b) Totara-kahikatea-towai forest with puriri and locally common mamaku occurs in the western part of the site.

Type (c) Towai-kanuka-rewarewa forest with taraire, tanekaha and occasional kahikatea, rimu, tawa, puriri and emergent kauri and northern rata.

Type (d) Towai-totara forest with taraire, kahikatea, tanekaha and occasional rewarewa, puriri, hinau and emergent kauri.

Type (e) Towai-tawa forest with frequent taraire and occasional emergent Hall's totara and northern rata.

In the subcanopy, sapling Hall's totara, tawa, mamangi, kanono, wheki and supplejack are common and locally abundant. Hen and chicken fern occurs frequently. Kidney fern and the filmy fern *Hymenophyllum demissum* are abundant at ground level.

Type (f) Towai-taraire forest with puriri and totara comprises a small area at the southern end of the site with an understorey of kohekohe, mamangi, mahoe and pigeonwood.

Type (g) Secondary totara forest occurs on the margins in the southeastern corner where *Selaginella* is invading.

Type (h) Kauri-rimu forest with tanekaha. Only a vestige remains on the margin at P05 833 533 of what was once a more extensive vegetation on the flats, judging from isolated trees in paddocks nearby.

Type (i) Kahikatea forest with occasional taraire, totara and puriri.

Where stock have penetrated, particularly on margins, there is little or no understorey.

### ***Fauna***

Kukupa (Category B threatened species) and NI brown kiwi (Category A threatened species) have been recorded at this site.

### ***Significance***

Contains representation of several uncommon associations - being the only sites in the Ecological District of types (c), (e) and (h), and representative site for types (a), (b), (d) and (i).

Habitat for threatened fauna.

The forest is important for upper catchment erosion control and riparian function maintaining downstream water quality and providing suitable instream habitat for a range of native fish and invertebrates in the Whakanekeneke River, which is regionally significant because of the extensive area of indigenous vegetation remaining in its upper catchments.

The site includes approximately 10 ha of Crown land, part of the Aratoro stewardship area.

## **OTAMARANGI STREAM BUSH**

Survey no. P05/003  
Survey date 27 May 1994  
Grid reference P05 830 545  
Area 30.2 ha  
Altitude 150-270 m asl

### ***Ecological unit***

- (a) Taraire-puriri-towai forest on hillslope
- (b) Towai-kahikatea forest on hillslope and gully (Kingett-Mitchell)
- (c) Kahikatea-totara forest on hillslope

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

Within an incised valley cut into Te Kuiti Group glauconitic sandstone and Mangakahia Complex micaceous sandstone and mudstone.

### ***Vegetation***

Secondary and cutover forest remnant.

Figure 18. Otamarangi Stream Bush, P05/003  
Each grid is 1000 m × 1000 m and equals 100 ha.  
f = forest.

Type (a) Taraire-puriri-towai forest with rewarewa, pukatea and kahikatea constitutes more than 50% of the area.

Type (b) Towai-kahikatea forest with puriri, totara and taraire with occasional rewarewa and pole rimu. Nikau and mamaku occur in the sub-canopy.

Type (c) Kahikatea-totara forest with puriri, taraire and occasional rimu, kauri and northern rata.

### ***Fauna***

Kukupu (Category B threatened species).

### ***Significance***

Habitat for kukupu.

Type (a) is the only example of its type in the Ecological District.

Its situation is very similar to Scotts Road Bush and it could be considered as part of that entity, performing the same function upon the same river system. Both of these sites are also likely to perform a linking role between the large forests of Puketi to the west and Opuia to the east.

## **WHAKANENEKE RIVER BUSH**

Survey no.	P05/005
Survey date	2 June 1994
Grid reference	P06 805 545
Area	140 ha total
Altitude	40-200 m asl

### ***Ecological unit***

- (a) Taraire forest on hillslope
- (b) Puriri-totara-taraire forest on gentle hillslopes (Kingett-Mitchell)
- (c) Totara-kahikatea-towai forest on plains and gentle hillslopes
- (d) Totara-kahikatea forest on hillslope/alluvium

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

A closely grouped collection of ten secondary forest remnants on a range of geomorphic bases including valley alluvium, Te Kuiti Group bioclastic sand, limestone bluffs, dissected hillslopes in Mangakahia Complex sandstones and mudstones, Kerikeri volcanic basalt plateau remnant and associated basalt talus slopes.

### ***Vegetation***

Although unfenced, many of these fragments are linked by scattered trees and narrow riparian strips. Associated canopy species include:

Type (a) Taraire forest with kahikatea, totara, puriri and nikau and occasional pukatea, rewarewa, kowhai, kohekohe, *Griselinia lucida* and northern rata.

Type (b) Puriri-totara-taraire forest with kahikatea.

Type (c) Totara-kahikatea-towai forest with puriri and locally common mamaku.

Type (d) Totara-kahikatea forest with occasional pukatea, kowhai, matai, puriri and titoki.

Figure 19. Whakanekeneke River Bush, P05/005  
Each grid is 1000 m × 1000 m and equals 100 ha.  
f = forest.

***Fauna***

Kukupu (Category B threatened species), NI brown kiwi (Category A threatened species) reported (B. King 1997).

***Significance***

Habitat for threatened fauna.

Representative of association of landform and vegetation types (a) and (d), both of which exhibit a diversity of canopy species.

The collective size of the remnants and buffering of the Whakanekeneke River and its tributaries, contribute to its overall significance.



## LAKE OMAPERE AND ENVIRONS

Survey no.	P05/006
Survey date	25 May 1994
Grid reference	P05 830 500
Area	1288.6 ha (forest 14.3; shrubland 6.2 ha; swamp shrubland 58.1 ha (cleared 1997); lake 1210 ha)
Altitude	238 m asl

### ***Ecological unit***

- (a) Open water in lake
- (b) Manuka swamp shrubland in swamp
- (c) Towai-totara forest on lake margin
- (d) Kahikatea forest on lake margin
- (e) *Juncus* rushland on lake margin

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

The lake was formed by the damming of a valley by a Kerikeri volcanic lava flow and the lake is mainly encircled by basalt lava with minor low-relief Mangakahia Complex sandstone rocks and areas of alluvium.

### ***Vegetation***

The largest freshwater lake in Northland, with a small catchment of 1700 ha, Lake Omapere was described in 1985 by the Northland Catchment Commission as eutrophic with up to two tonnes of phosphate entering it every year from the adjoining catchment, and with possibly as much as 15 tonnes of phosphorus being released in a fairly short time prior to the 1985–86 algal bloom.

It is a shallow lake (maximum depth 1.9 m), in which the algal bloom of 1985–86 coincided with the collapse of weed beds of *Egeria densa* which covered most of the lake.

Silver carp (*Hypophthalmichthys molitrix*) were introduced in 1988–89, and a permeable rock barrier was established at the lake outlet.

The lake remained unvegetated until 1994. *Egeria* has re-established and, at the time of writing, it was again well-established in dense beds over 80% of the lake floor and may revert to an algal dominated state (D. Kokich Northland Regional Council pers. comm. June 2000).

*Potamogeton ochreatus* and *Chara corallina* occur in open patches between clumps of *Egeria*. In shallow margins, *Glossostigma elatinoides*, *G. cleistanthum*, *Nitella stuartii*, and *Elatine gratioloides* occur adjacent to emergent sedges (Champion & Rowe 1996).

Phytoplankton identified in 1996 included the diatom *Aulacoseira granulata* which was common, with low numbers of other diatoms, green and yellow-green algae. The cyanobacteria *Microcystis* was present in very low numbers.

Very little native vegetation remains either adjoining the lake or within the catchment. Wetland margins have largely been drained, facilitating the fast movement of nutrified runoff into the lake without the benefit of nutrient extraction by the roots of marsh vegetation.

Associated species include:

Type (b) Manuka swamp shrubland with flax and occasional cabbage tree. Cleared in 1997.

Type (c) Towai-totara forest - manuka with occasional kahikatea, rewarewa and cabbage tree.

Figure 20. Lake Omapere and Environs, P05/006

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

s = shrubland; f = forest; w = wetland.

Type (d) Kahikatea forest - totara with occasional puriri.

Significant flora

This is the only site in Northland for the fern ally *Isoetes* aff. *kirkii* (Critically Endangered - Taxonomically Indeterminate) which is of restricted distribution in the North Island, with this being the only remaining site north of Rotorua. The plant was only recently rediscovered in the lake and appears to be very rare (L. Forester pers. comm. 2000).

***Fauna***

Black swans are abundant. Other species recorded include paradise shelduck, grey duck, black shag, pukeko, pied stilt, Australasian bittern (Category O threatened species) and NI fernbird (regionally significant species).

Black swan numbers declined from approximately 8000 to 1000 following the algal bloom, and are currently around 3000.

A large colony of black shag (45+) utilise the marginal forest for breeding.

Aquatic fauna includes koura (1997), freshwater mussel in high numbers, common bully, smelt, long-finned eel, short-finned eel, goldfish, mosquitofish and silver carp. At the time of writing, there is a proposal to introduce grass carp (*Ctenopharyngodon idella*) to control the *Egeria*.

### ***Significance***

The largest freshwater lake in Northland. It is classified as a moderately well-defined landform of scientific, educational and scenic value, with national importance (Kenny & Hayward 1993).

Types (b) and (e) are the only examples of their types in the Ecological District recorded in this survey.

The only Northland site of a very rare and threatened aquatic plant species.

A strip on the western side of the lake comprising 5.5 ha is administered by the Department of Conservation.

## **WAIKARAKA STREAM BUSH**

Survey no.	P05/007
Survey date	31 May 1994
Grid reference	P05 783 575
Area	51.8 ha (forest 38 ha; shrubland 13.8 ha)
Altitude	40-236 m asl

### ***Ecological unit***

- (a) Taraire-towai forest on hillslope (65%)
- (b) Manuka shrubland on hillslope (5%)
- (c) Puriri-taraire forest on bluffs (10%)
- (d) Kahikatea forest on hillslope (20%)

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

Moderate to steeply sloping hill country underlain by Te Kuiti Group calcareous mudstone and bioclastic sandy limestone on the bluffs and Akarana Supergroup massive to flaggy calcareous mudstone with sandstone beds.

### ***Vegetation***

This site is composed of four closely associated forest remnants. Associated canopy species include:

Type (a) Taraire-towai forest - puriri, rimu, kahikatea, totara with occasional pukatea, rewarewa, hinau and northern rata.

Type (b) Manuka shrubland - occasional towai and mamaku tree fern.

Type (c) Puriri-taraire forest - karaka, totara and occasional kowhai.

Type (d) Kahikatea forest - totara, towai with occasional rimu and taraire.

Figure 20. Waikaraka Stream Bush, P05/007

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

s = shrubland; f = forest.

### ***Fauna***

Kukupu (Category B threatened species).

### ***Significance***

Its geological formation is of restricted distribution in Northland, hence all of the associated vegetation types are significant for their representativeness, particularly the puriri-taraire forest on limestone bluffs.

Habitat for threatened species.

This forest remnant is well placed to perform a linking function between the large block of Puketi Forest and the remnant mosaic extending to the east towards Opua Forest.

A Queen Elizabeth II National Trust covenant protects 20 ha of this site in the vicinity of the limestone bluffs.

## **WAIHOANGA STREAM FOREST OUTLIER**

Survey no. P05/008  
Survey date 31 May 1994  
Grid reference P05 775 585  
Area 46.9 ha  
Altitude 80-200 m asl

### ***Ecological unit***

- (a) Kahikatea forest on hillslope
- (b) Taraire-totara forest on hillslope
- (c) Puriri-kowhai forest on hillslope

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

It is underlain by Te Kuiti Group glauconitic sandstone adjacent to the Waipapa horst, Mangakahia Complex micaceous sandstone on the upper slopes and Mangakahia Complex mudstones on the lower slopes.

### ***Vegetation***

A small forest outlier of Puketi Forest which lies within the separate Ecological District of Kaikohe. The forest is secondary and/or heavily cutover in nature with high stock and pig numbers occasionally present. Associated canopy species include:

Figure 22. Waiohanga Stream Forest Outlier, P05/008  
Each grid is 1000 m × 1000 m and equals 100 ha.  
f = forest.

Type (a) Totara-kahikatea forest - towai and taraire with occasional rewarewa, rimu, northern rata, pukatea and puriri.

Type (b) Taraire-puriri-kahikatea forest - rewarewa, kowhai, *Griselinia lucida*, kanuka and nikau with occasional emergent rimu and pukatea, matai, northern rata, lacebark, tawa, titoki and tarata.

### ***Fauna***

Common forest birds.

### ***Significance***

These remnants may play a role in linking the large Puketi Forest to the north with the smaller Pukewharariki Forest to the south.

Representative example of type (b), which exhibits a diversity of other canopy species present.

An upper catchment/riparian protection function is implied.

Figure 23. Donaldsons Road Bush, P05/010

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

f = forest.

Totara-kahikatea dominant type (b) has frequent taraire and nikau with occasional rewarewa, kowhai, puriri, rimu, towai, *Griselinia lucida* and pukatea.

The area has a severely grazed understorey.

### ***Fauna***

Kukupa (Category B threatened species) and moderate to high numbers of NI brown kiwi (Category A threatened species).

### ***Significance***

Habitat for threatened species.

Type (a) is the only example of its type in the Ecological District, and a representative site for type (b).

This site may perform a linking function due to its central position between two large forest blocks.

An upper catchment and riparian protection function is also implied.

## **OKORO STREAM BUSH**

Survey no.	P05/012
Survey date	1 June 1994
Grid reference	P05 735 543
Area	68.9 ha
Altitude	40-200 m asl

### ***Ecological unit***

(a) Totara-kahikatea-kanuka forest on hillslope

(b) Totara-taraire-puriri forest on hillslope

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

The upper catchment is of Kerikeri volcanics basalt flow remnants with basalt talus downslope underlain by Mangakahia Complex sandstone which extends into the dissected hills downslope.

### ***Vegetation***

A moderate-sized secondary forest outlier of a larger forest remnant which lies to the south-west.

Type (a) Totara-kahikatea-kanuka forest with puriri and tanekaha, and occasional northern rata, titoki, *Griselinia lucida*, pukatea, kohuhu and lacebark.

Approximately 5 ha of this type was cleared in 1997.

Type (b) Totara-taraire-puriri forest with tawa, titoki, kahikatea and occasional matai and rewarewa.

Possum and stock browse in both the canopy and the understorey/ground storey is severe.

### ***Fauna***

NI brown kiwi (Category A threatened species) reported and kukupa (Category B threatened species) and kauri snail (Category C threatened species) present.

### ***Vegetation***

A small secondary forest outlier of Puketi Forest (separate Ecological District), this site's value is greatly enhanced by its close and contiguous proximity to the large block.

Puriri is occasional within type (a) above and taraire, puriri, towai with occasional pukatea, kauri, rimu and northern rata in type (b).

It appears that approximately 20 ha of type (b) has been developed since survey, with the remaining area apparently fenced.

### ***Fauna***

Not surveyed but contiguity with Puketi Forest would suggest many faunal values will be shared.

### ***Significance***

Its main significance lies in its proximity and contiguity with Puketi Forest.

Type (a) is a representative site for the Ecological District.

Figure 26. Forest Road Bush, P05/013

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

s = shrubland; f = forest.



Representative site for types (a) and (g).

Type (b) is one of only two examples of a totara-kahikatea forest on alluvium.

Type (d) is one of only four examples in the Ecological District and type (f) - kauri forest, one of only two examples.

Figure 27. Te Toke Stream Shrubland, P05/014  
Each grid is 1000 m × 1000 m and equals 100 ha.  
s = shrubland; f = forest.

Species associated with type (b) include rimu and mamaku, with occasional emergent kauri and northern rata, towai, lacebark and kohuhu.

***Fauna***

Common forest birds utilise the site and NI brown kiwi (Category A threatened species) are likely to be present as they are reported from the adjoining Okoro Stream Bush (P05/012).

***Significance***

Type (a) is one of only four examples and type (b) is the only example of this vegetation type in the Ecological District.

Contiguous with other large forest remnants (P05/012 and P05/014) with a linkage and upper catchment protection function implied.

Likely to be habitat for kiwi.

**COOKS ROAD BUSH NO. B**

Survey no.	P05/016
Survey date	1 June 1994
Grid reference	P05 743 528
Area	25.3 ha
Altitude	90-200 m asl

***Ecological unit***

- (a) Taraire-puriri forest on hillslope (90%)
- (b) Kahikatea-totara forest on hillslope (10%)

***Landform/geology***

A steeply dissected upper catchment underlain by Mangakahia Complex sandstone.

## **COOKS AIRSTRIP BLOCK**

Survey no.	P05/017
Survey date	1 June 1994
Grid reference	P05 735 520
Area	196.3 ha (forest 88.9 ha; shrubland 107.4 ha)
Altitude	80-270 m asl

### ***Ecological unit***

- (a) Manuka-towai-totara forest on hillslope (20%)
- (b) Totara-kahikatea forest on hillslope (20%)
- (c) Towai-taraire forest on hillslope (10%)
- (d) Manuka shrubland on hillslope (30%)
- (e) Kanuka-totara forest on hillslope (15%)
- (f) Tanekaha shrubland on hillslope (<5%)

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

Underlain by Kerikeri volcanics and basalt talus on hillslopes and deeply dissected catchments cut into Mangakahia Complex siliceous mudstone.

### ***Vegetation***

A moderate sized cutover and secondary forest remnant with extensive adjoining shrubland and small outlier

Associated canopy species:

Type (a) Manuka-towai-totara forest includes tanekaha, kahikatea and rimu, with occasional emergent pukatea, kauri and puriri.

Type (b) Totara-kahikatea forest includes frequent nikau and occasional puriri and pukatea.

Type (c) Towai-taraire forest includes emergent old growth totara, kahikatea and rimu, puriri and tanekaha, with occasional pukatea, nikau, northern rata and matai.

Type (d) Manuka shrubland includes scattered totara, kahikatea and tanekaha. At least 15-20 ha of this has been cleared since the area was originally surveyed, and planted in pines. In the remaining shrubland, totara and tanekaha are locally frequent.

Type (e) Kanuka-totara secondary forest in which karaka is locally frequent and also includes frequent puriri, kahikatea, tanekaha and mamaku with occasional cabbage tree, nikau and mamaku tree fern.

On the upper slopes this type merges into a diverse canopy which is a mosaic of these species together with kahikatea, puriri, taraire and rimu.

(f) Tanekaha shrubland - vigorous secondary growth with frequent manuka/kanuka and totara.

### ***Fauna***

Kukupu (Category B threatened species), kauri snail (Category C threatened species) and NI brown kiwi (Category A threatened species). Additional survey, particularly for reptile fauna, is recommended.

### **PURIRI FARM BUSH**

Survey no.	P05/018
Survey date	1 June 1994
Grid reference	P05 795 515
Area	61.8 ha
Altitude	200-250 m asl

Figure 31. Puriri Farm Bush, P05/018

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

f = forest.

Figure 32. Okaka Road Wetland, P05/019  
Each grid is 1000 m × 1000 m and equals 100 ha.  
w = wetland.

### ***Vegetation***

Plants associated with type (a) above include *Juncus*, sedges and occasional swamp maire.

Type (b) contains manuka and cabbage tree occurring occasionally in the wetter raupo/*Carex* dominant portion.

### ***Fauna***

Not surveyed.

### ***Significance***

The only site in the Ecological District for these vegetation types, which are also not well-represented in the Ecological Region and nationally.

Further survey work is recommended to further assess the full significance of this site.

## **UTAKURA BUSH**

Survey no. P05/021  
Survey date 2 June 1994  
Grid reference P05 710 500  
Area 174.3 ha (forest 116.2 ha; shrubland 58.1 ha)  
Altitude 40-140 m asl

### ***Ecological unit***

- (a) Manuka/kanuka-totara-kahikatea forest on hillslope
- (b) Manuka shrubland on hillslope

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

Secondary forest and shrubland mosaic of predominantly Mangakahia Complex sandstone with an area of Mangakahia Complex siliceous mudstone near Horeke Road.

Figure 34. Utakura Bush, P05/021

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

s = shrubland; f = forest.

Figure 35. Waiohanga Bush, P05/023

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

s = shrubland; f = forest.

### ***Fauna***

Kukupu (Category B threatened species) and kauri snail (Category C threatened species). Reported to contain NI brown kiwi (Category A threatened species). NI kaka (Category B threatened species) were reported to DOC in 1994 but probably only utilise it seasonally.

### ***Significance***

Habitat for threatened fauna.

The site is significant for its riparian values as it covers a considerable portion of two sub-catchments of the Utakura River. The Imms Rd weir may be limiting fish access to upstream habitat.

It may also play a partial linking role between Pukewharariki and Puketi Forests.

Figure36. Pukewharariki Forest, O05/078

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

s = shrubland; f = forest; w = wetland.



## **GUTHRIES BLOCK**

Survey no.	P05/025
Survey date	18 May 1994
Grid reference	P05 715 420
Area	255.1 ha
Altitude	<80 m-238 m asl

### ***Ecological unit***

- (a) Towai-tanekaha forest on hillslope (50%)
- (b) Kahikatea forest on flats (5%)
- (c) Manuka shrubland on hillslope (20%)
- (d) Taraire forest on hillslope (25%)

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

The steeply dissected hill country is underlain predominantly by Mangakahia Complex sandstone with some siliceous mudstone (Ngatuturi) to the north-east.

### ***Vegetation***

A large outlier of Pukewharariki Forest which is a mosaic of secondary and cutover forest with peripheral shrubland.

Associated canopy species include:

Type (a) Towai-tanekaha forest - frequent puriri, kohekohe, kauri and tawa, with kauri locally common and occasional totara, manuka, northern rata and rimu.

Type (b) Kahikatea forest - occasional puriri, totara and pukatea

Type (c) Manuka shrubland - frequent tanekaha, totara and towai, providing a narrow link to Pukewharariki (P05 024).

Type (d) Taraire forest - towai, puriri and tanekaha with occasional kohekohe, tawa, nikau and emergent pukatea, kauri, rimu and northern rata.

### ***Fauna***

NI brown kiwi (Category A threatened species) are known to be present in moderate densities (P. Miller pers. comm.).

### ***Significance***

One of only three examples in the Ecological District of type (a), and representative site for type (c).

The large size and close association with another larger forest block (Pukewharariki) adds to its value.

Habitat for threatened fauna.

An upper catchment/riparian protection function is implied.

This site includes approximately 201 ha of the Mangatoa Stewardship land administered by the Department of Conservation.

## **MANGATOA STREAM BUSH**

Survey no.	P05/026
Survey date	18 May 1994
Grid reference	P05 764 420
Area	71.6 ha
Altitude	100-200 m asl

Figure 38. Mangatoa Stream Bush, P05/026

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

f = forest.

Figure 39. Monument Bush, P05/027

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

s = shrubland; f = forest.

## **WAIHOANGA ROAD BUSH**

Survey no. P05/028  
Survey date 17 May 1994  
Grid reference P05 817 459  
Area 32.2 ha  
Altitude 260-300 m asl

### ***Ecological unit***

(a) Towai forest on hillslope

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

Dissected hill country underlain by Mangakahia Complex sandstone possibly with some basalt talus on the south-eastern side of the valley.

### ***Vegetation***

A secondary and cutover forest remnant headwater in the catchment of the Utakura River.

Associated canopy species include frequent puriri, rewarewa and taraire with occasional pukatea, rimu and totara. Kauri is locally common on the ridge, where rimu is also emergent.

Figure 40. Waiohanga Road Bush, P05/028  
Each grid is 1000 m × 1000 m and equals 100 ha.  
f = forest.

Figure 41. Reservoir Bush, P05/029

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

s = shrubland; f = forest.

### ***Significance***

Habitat for threatened fauna and contains a regionally significant plant species.

This site includes the 50 ha Kaikohe Scenic Reserve administered by the Department of Conservation, 25 ha of waterworks reserve administered by the Far North District Council, and 5 ha of type (b) protected under a Queen Elizabeth II National Trust covenant.



## **RAKAUTAO BUSH**

Survey no.	P05/031
Survey date	17 May 1994
Grid reference	P05 877 406
Area	368.9 ha (forest 242.3 ha; shrubland 126.6 ha)
Altitude	120-315 m asl

### ***Ecological unit***

- (a) Taraire-totara-kanuka forest on hillslope
- (b) Totara-towai-kanuka forest on hillslope
- (c) Manuka-mamangi-towai shrubland on hillslope
- (d) Towai-totara-rewarewa forest on hillslope
- (e) Manuka-*Gleichenia* shrubland on hillslope
- (f) Raupo-*Baumea* association in swamp

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

On dissected hill country underlain by Mangakahia Complex siliceous mudstone.

### ***Vegetation***

Cutover and secondary forest with shrubland linkages, gumfield and wetland gully floors.

Associated canopy species:

Type (a) Taraire-totara-kanuka forest includes frequent puriri, northern rata and rewarewa with occasional pukatea and rimu.

Type (b) Totara-towai-kanuka forest includes kahikatea and tanekaha with occasional rimu, rewarewa, pukatea and puriri.

Type (c) Manuka-mamangi-towai shrubland contains occasional tanekaha.

Type (d) Towai-totara-rewarewa forest includes taraire, pukatea, tawa and kanuka with occasional kauri, rimu and puriri.

The gumlands of type (e) Manuka-*Gleichenia* shrubland cover about a third of the site and include *Dracophyllum* sp. with occasional *Hakea* sp., kumerahou, mingimingi and hangehange.

In Type (f) Raupo-*Baumea* association, swamp maire can be found associated with the freshwater wetland margin.

### ***Fauna***

Supports a high density of NI fernbird (regionally significant species). NI brown kiwi (Category A threatened species), although not recorded within this specific site, are known to be present in low numbers within this forest continuum.

### ***Significance***

An important representative site, including a gumland association which has become scarce as a result of land development practices.

It is the only example in the Ecological District for types (a), (b), (c), (d) and (e) and one of only two examples of type (f).

Large native forest enclaves within large pine plantations are important refuge areas for native species during logging.

Habitat for a regionally significant species.

Figure 43. Rakautao Bush, P05/031

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

s = shrubland; f = forest.



## **TITIHUATAHU**

Survey no. P05/032  
Survey date 11 May 1994  
Grid reference P05 910 430  
Area 988.3 ha (forest 284.1; shrubland 701.2 ha, wetland 2.9 ha)  
Altitude 140-283 m asl

### ***Ecological unit***

- (a) Towai-kauri forest on hillslope
- (b) Towai-taraire forest on hillslope
- (c) Manuka-cabbage tree forest in valley
- (d) Manuka-*Baumea-Gleichenia* shrubland on hillslope

Figure 44. (above and opposite) Titihuatahu, P05/032  
Each grid is 1000 m × 1000 m and equals 100 ha.  
s = shrubland; f = forest; w = wetland.

### **Landform/geology**

The site is largely underlain by Mangakahia Complex siliceous mudstone with a small area of alluvium near the northwestern edge and forms part of the upper catchment of the Waitangi and Kawakawa Rivers.

### **Vegetation**

This site exists as two large mosaics of secondary/cutover forest remnants, often in gullies surrounded by plantation forestry and gum-related shrubland on the ridges and rolling hill country.

Type (a) Kauri emergent over towai includes frequent totara and manuka with occasional tawa, hinau, tanekaha, taraire, miro, rewarewa and northern rata.

Type (b) Towai-taraire forest includes totara, rewarewa and puriri, with occasional tawa, miro, kahikatea, nikau, rimu, pukatea and tanekaha. Occurs at P05 910 410 and P06 917 399.

Type (c) Manuka-cabbage tree forest includes frequent kahikatea.

Type (d) Manuka-*Baumea-Gleichenia* shrubland constitutes about 50% of the site. *Baumea rubiginosa* is co-dominant, with *Dracophyllum* sp., *Leucopogon* sp., *Lycopodiella cernua* and *Pomaderris* sp. Gorse and hakea are local.

#### Significant flora

*Pittosporum pimeleoides* ssp. *pimeleoides* (Naturally Uncommon-Sparse) known from an area under protective covenant but may be present throughout the forest in this area. The fern, *Todea barbara* (Vulnerable), and sedge *Baumea complanata* (Declining) are present.

*Utricularia delicatula* is a bladderwort of restricted distribution.

### **Fauna**

NI brown kiwi (Category A threatened species) are known in low numbers within the forest remnants and probably extend into the shrubland. NI fernbird, a regionally significant species, are present in high numbers throughout the shrublands.

### **Significance**

The gumlands are representative of a habitat type which once covered about one-quarter of the land north of Auckland (Esler & Rumball 1974), but has been reduced by land development practices to a few small remnants, most of which are still under considerable threat of development.

Type (d) manuka-*Baumea-Gleichenia* and type (a) towai-kauri are one of only two examples and type (c) manuka-cabbage tree is one of only three examples of its type in this Ecological District.

Habitat for threatened and regionally significant species.

Queen Elizabeth II National Trust covenants protect five separate areas of this site including a 116 ha and a 19.5 ha of forest, as well as 2340 m<sup>2</sup> to protect *Todea barbara*, 1.8 ha of *Baumea complanata* and 2970 m<sup>2</sup> covering the *Utricularia* site.

## NGAWHA GEOTHERMAL FIELD

Survey no.	P05/033
Survey date	17 May 1994
Grid reference	P05 895 428
Area	181 ha (swamp shrubland 101.3 ha; wetland 66.4 ha; shrubland 13.1 ha)
Altitude	150–200 m asl

### ***Ecological unit***

- (a) Manuka shrubland on low ridges
- (b) *Baumea-Schoenus*-manuka association in bog
- (c) *Gleichenia* fernland on swampy and low-lying flats
- (d) Open water in small lakes
- (e) *Baumea* sedgeland in bog

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

Podzol shrubland and bog vegetation on low siliceous mudstone ridges, depressions and swampy areas associated with an active geothermal field.

### ***Vegetation***

Manuka is dominant to 4.5 m (lower, to 1.5 m in the west), often with an open canopy. Gorse is scattered throughout, and locally frequent. Towai is occasional. Other species present include *Dracophyllum lessonianum*, mingimingi, *Dianella*, umbrella fern and *Schoenus tendo*. Bracken, kumeraho, small ponga, wheki, *Lepidosperma laterale*, *Gabnia* and the club mosses *Lycopodiella cernua* and *Lycopodium deuterodensum* are scattered.

Type (b) occurs on raised flats and gentle slopes. *Baumea teretifolia* and *Schoenus brevifolius* are intermixed with low manuka and *Dracophyllum*. Prickly hakea occurs on dry sites with abundant *Tetraria capillaris* and common *Lepidosperma australe*. *Epacris pauciflora* and umbrella fern are locally abundant. Mingimingi and *Dianella* are common. *Thelymitra* orchids and sundews are common in open areas, and the creeping club moss *Lycopodiella lateralis* is present.

Type (c) *Gleichenia* occurs in dense swards with *B. teretifolia* and *Dracophyllum*, with *Sphagnum* moss underneath.

Type (e) *Baumea complanata* forms dense monospecific swards on damp substrates in disturbed areas.

### **Significant flora**

Includes one of only four known locations for the sedge *Baumea complanata* (Declining), the Vulnerable fern *Todea barbara*, the mistletoe *Korthalsella salicornioides* (Naturally Uncommon–Sparse) and the southernmost record of the orchid *Thelymitra malvina* (Range Restricted).

### ***Fauna***

Fauna includes a new species of mudfish, known only from three sites in Northland *Neochanna beletos* (Category A threatened species), Australasian bittern, (Category O threatened species), NI fernbird and spotless crane (regionally significant bird species).

Figure 45. Ngawha Geothermal Field, P05/033  
Each grid is 1000 m × 1000 m and equals 100 ha.  
s = shrubland; w = wetland.

NI brown kiwi (Category A threatened species) and brown teal (Category C threatened species) have also been reported within this site, but the continued presence of teal has not been confirmed for many years.

### ***Significance***

Types (b), (c) and (e) are the only examples of their type in the Ecological District, and type (a) is one of only two sites.

The associated “pipe clay” gumlands (as distinct from the “sand gumlands” of which the Ahipara gumfields are the best remaining example) have gained a significance approaching that of the geothermal field due to the extensive development of similar sites elsewhere in Northland.

Habitat for threatened species including flora and mudfish species which do not readily survive in other habitat types.

Lake Waiparaheka Scientific Reserve is an internationally important soil site of hydrothermally altered peat (Arand et al. 1993).

This site includes the 18 ha Lake Waiparaheka Scientific Reserve, established to protect the unique assemblage of geothermal flora and fauna, and 43 ha of contiguous stewardship land administered by the Department of Conservation.

Thirty five hectares of wetland habitat is protected under a Queen Elizabeth II National Trust covenant.

Source: Clunie 1983, Esler & Rumball 1974.

## **NGAWHA SWAMPS**

Survey no.	P05/034
Survey date	14 February 1995
Grid reference	P05 885 460
Area	total 24.1 ha
Altitude	c. 220 m asl

### ***Ecological unit***

(a) Raupo reedland in swampy valleys (90%)

(b) Kahikatea-cabbage tree-swamp maire swamp forest on alluvium (10%)

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

Hydrological system on the edge of a Kerikeri volcanics basalt flow which adjoins alluvium.

### ***Vegetation***

Five remnant wetlands and a small swamp forest remnant.

Type (a)

Apart from large areas of raupo monoculture, associated plants include crack willow, cabbage tree and occasional kahikatea.

Type (b)

An area of remnant swamp forest hydrologically linked to the wetlands but physically adjoining the large “pipe clay” gumlands to the south-east has been included within this site because of the closer physiographic links with the alluvial/wetland ecosystem.

Figure 46. Ngawha Swamps, P05/034

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

w = wetland.

This area has occasional pukatea as an associated species.

Significant flora

*Thelypteris confluens*, a swamp fern classified as Vulnerable.

***Fauna***

Habitat for Australasian bittern (Category O threatened species) and spotless crane (regionally significant species).

***Significance***

Representative of two rare and diminishing habitat types - mineralised freshwater wetland and swamp forest - the latter being one of only two examples of its type recorded in the Ecological District.

Habitat for threatened fauna and flora.

A water quality protection function is implied.

## YOUNGS KAHIKATEA REMNANT

Survey no. P05/035  
Survey date 14 February 1995  
Grid reference P05 873 457  
Area 12.1 ha  
Altitude 230-240 m asl

### ***Ecological unit***

- (a) Kahikatea forest on toeslope (80%)
- (b) Swamp maire-kahikatea-cabbage tree swamp forest on volcanic flats (10%)
- (c) Manuka shrubland on volcanic flats (10%)

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

Underlain by a recent Kerikeri volcanic basalt flow.

### ***Vegetation***

A small area of young swamp forest in the upper catchment of the Ngawha Stream which eventually flows into the Waitangi River.

Associated canopy species of type (a) include occasional totara and rimu. Type (b) includes occasional raupo and *Carex* sp.

### ***Fauna***

Not surveyed.

### ***Significance***

Representative of a rare and diminishing habitat type - swamp forest, with type (b) being one of only two examples in this Ecological District.

Figure 47. Youngs Kahikatea Remnant, P05/035

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

s = shrubland; f = forest.



## **NGAWHA BUSH**

Survey no. P05/037  
Survey date 14 February 1995  
Grid reference P05 878 468  
Area 18 ha (forest 14.1 ha; shrubland 3.9 ha)  
Altitude 260-340 m asl

### ***Ecological unit***

- (a) Taraire-puriri forest on hillslope (80%)
- (b) Mamaku-totara shrubland on hillslope (20%)

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

Southern flank of a young Kerikeri volcanics basaltic volcano.

Figure 48. Ngawha Bush, P05/037

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

s = shrubland; f = forest.

### ***Vegetation***

Two small shrubland and cutover forest remnants.

The majority of the site is the cutover puriri-taraire forest which includes tawa and rewarewa with occasional kohekohe and totara.

The shrubland component helps link the two remnants and includes, as associated species, pate and gorse with occasional tobacco weed.

### ***Fauna***

Not surveyed.

### ***Significance***

The volcanic broadleaf component is representative of an increasingly rare forest type, and this site contains the largest example of taraire-puriri forest on young Kerikeri basaltic volcanics. It is the only site in the Ecological District where type (b) has been noted.

Further survey work would help to determine the full significance of this site.

## **REMUERA SETTLEMENT ROAD REMNANTS**

Survey no.	P05/038
Survey date	18 February 1995
Grid reference	P05 863 485
Area	56.2 ha
Altitude	260-374 m asl

### ***Ecological unit***

- (a) Totara forest on hillslope (25%)
- (b) Towai forest on hillslope (40%)
- (c) Taraire forest in crater (20%)
- (d) Kahikatea forest in crater (10%)
- (e) Puriri forest on hillslope (5%)

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

On the flanks and within the crater of an andesitic basalt volcano.

### ***Vegetation***

Fragmented secondary forest remnants.

Type (a) Totara forest includes occasional kahikatea, puriri and towai.

Type (b) Towai forest includes frequent puriri with occasional taraire, rewarewa, tawa, totara and pukatea.

Type (c) Taraire forest includes frequent pukatea with occasional rimu, kauri, tawa, totara and puriri.

Type (d) Kahikatea forest includes occasional pukatea, totara, kauri and rimu.

Type (e) Puriri forest includes frequent taraire with occasional totara.

### ***Fauna***

Not surveyed.

Figure 49. Remuera Settlement Road Remnants, P05/038

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

f = forest.

### ***Significance***

As the only andesitic basalt volcano in this Ecological District, this site represents the only examples of these ecological units.

These remnants constitute virtually the only forest in the catchment of Lake Omapere and may play a role in limiting nutrient inflow into the lake system.

Classified as a geopreservation site of regional importance (Kenny & Hayward 1993).

Approximately 1.7 ha of riparian margin in the western block is administered by the Department of Conservation.

## **SOUTH OMAPERE KAHIKATEA REMNANT**

Survey no. P05/039  
Survey date 18 February 1995  
Grid reference P05 844 491  
Area 3.1 ha  
Altitude 240 m asl

### ***Ecological unit***

- (a) Kahikatea forest on flats (90%)
- (b) Flax swamp on flats (10%)

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

In a small depression on the edge of Lake Omapere near the top of a small Mangakahia Complex sandstone bluff.

Figure 50. South Omapere Kahikatea Remnant, P05/039

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

f = forest; w = wetland.

### ***Vegetation***

A small remnant of secondary kahikatea forest and mineralised wetland.

Unfortunately the freshwater wetland on the eastern margin is suffering from a lowered water table and will eventually be dry land.

Canopy species associated with the kahikatea forest include totara and occasional puriri.

### ***Fauna***

Not surveyed.

### ***Significance***

As well as being an under-represented vegetation type in the Ecological District and Region, (the only example of type (b) recorded in this Ecological District), this site constitutes one of the very few remaining forest remnants adjoining Lake Omapere.

## **WAINGARURU STREAM SWAMP**

Survey no.	P05/040
Survey date	14 February 1995
Grid reference	P05 900 476
Area	7.5 ha (forest 1.7. ha; wetland 5.8 ha)
Altitude	c. 190 m asl

### ***Ecological unit***

- (a) Cabbage tree-raupo association in swamp (25%)
- (b) Toetoe-raupo association in swamp (40%)
- (c) Flax-raupo association in swamp (10%)
- (d) Kahikatea-pukatea swamp forest on volcanic flat (25%)

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

On a young Kerikeri volcanic basalt flow.

### ***Vegetation***

A small remnant mineralised wetland with peripheral swamp forest remnant.

Associated plant species include for type (b) Toetoe-raupo association, occasional cabbage tree and *Coprosma tenuifolia*.

Type (c) Flax-raupo association includes cabbage tree and occasional swamp maire.

Type (d) Kahikatea-pukatea swamp forest includes occasional towai.

### ***Fauna***

Australasian bittern (Category O threatened species), and two regionally significant species, banded rail, a species not commonly found in freshwater wetlands, and spotless crane.

Figure 51. Waingaruru Stream Swamp, P05/040  
Each grid is 1000 m × 1000 m and equals 100 ha.  
f = forest; w = wetland.

***Significance***

Types (a), (b) and (c) are the only examples of their type recorded in this Ecological District during this survey, and type (d) kahikatea-pukatea dominant swamp forest, is one of only two examples although very small (c. 2 ha).

Habitat for threatened and regionally significant species.

## **WAITAHEKE ROAD BUSH**

Survey no. P05/041  
Survey date 14 February 1995  
Grid reference P05 902 470  
Area 9 ha  
Altitude c. 190 m asl

### ***Ecological unit***

- (a) Puriri-tarairi forest on hillslope (10%)
- (b) Kahikatea forest on volcanic flat (40%)
- (c) Towai forest on hillslope (5%)
- (d) Puriri-totara-kahikatea forest on volcanic flat (45%)
- (e) Raupo reedland in swampy valley (<1%)

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

Situated on the surface of a young Kerikeri volcanic basalt flow.

### ***Vegetation***

A small secondary forest/wetland remnant.

Figure 52. Waitaheke Road Bush, P05/041  
Each grid is 1000 m × 1000 m and equals 100 ha.  
f = forest.

The dominant vegetation types are (b) and (d), with occasional rewarewa, matai, rimu, taraire and pukatea within the latter.

The wetland component is very small and modified by stock browse.

### ***Fauna***

Not surveyed.

### ***Significance***

Contains representation of podocarp and podocarp/broadleaf forest on volcanic flats - both uncommon associations, and a small mineralised freshwater wetland remnant. Type (d) is one of only three examples of its type recorded in the Ecological District during this survey.

## **TAUMATATARAIRE STREAM BUSH**

Survey no.	P05/042
Survey date	13 February 1995
Grid reference	P05 940 475
Area	63.7 ha (forest 58.1 ha; shrubland 5.6 ha)
Altitude	60-117 m asl

### ***Ecological unit***

- (a) Kahikatea forest on volcanic flat (10%)
- (b) Totara forest on hillslope (5%)
- (c) Puriri-titoki-taraire forest on hillslope (75%)
- (d) Manuka shrubland on hillslope (<10%)

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

Valleys cut through a young Kerikeri volcanic basalt flow with Mangakahia Complex mudstone in the Waiaruhe Stream valley and Motatau Complex glauconitic sandstone in the Taumataraire Stream valley.

### ***Vegetation***

Five forest remnants centred around the largest type (a) kahikatea forest, an area of diverse old growth broadleaf forest bordering the Waiaruhe River. The others are a mixture of broadleaf forest, secondary podocarp forest and shrubland.

Canopy species associated with type (b) totara forest includes occasional kahikatea.

Type (c) Puriri-titoki-taraire forest includes karaka, kohekohe and rewarewa with occasional tawa, kahikatea, *Griselinia lucida* and pukatea.

Type (d) Manuka shrubland includes gorse and totara with occasional kahikatea. High goat and possums numbers have been noted, however.

### ***Fauna***

Common forest birds. Likely to be an important seasonal food source for kukupa (Category B threatened species).



Figure 53. Taumatataraire Stream Bush, P05/042

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

s = shrubland; f = forest.

***Significance***

Contains representation of a rare association - kahikatea forest on volcanic flats - and the puriri-taraire-titoki association is the only example of its type recorded in the Ecological District and is also regionally uncommon.

Further survey work would be an advantage as another similar forest in the area has high botanical values. Riparian protection values are implied.

## WAIARUHE BUSH REMNANTS

Survey no. P05/043  
Survey date 14 February 1995  
Grid reference P05 955 498  
Area 29.7 ha  
Altitude c. 60 m asl

### *Ecological unit*

(a) Kahikatea forest on alluvium

### *Landform/geology*

Alluvium ponded by a volcanic basalt flow.

### *Vegetation*

Three secondary kahikatea remnants.

The strongly kahikatea dominant canopy is shared with occasional rimu, pukatea and taraire.

The southern area has been subjected to light selective logging and unrestricted stock access.

Figure 54. Waiaruhe Bush Remnants, P05/043  
Each grid is 1000 m × 1000 m and equals 100 ha.  
f = forest.

### ***Fauna***

Common forest birds.

### ***Significance***

The scarcity of this forest type gives these remnants high representative significance. However, if these sites are to retain or improve their representative values, it is imperative that the water table not be altered and preferable that all three be protected from stock browse.

## **POUERUA CONE**

Survey no.	P05/044
Survey date	13 February 1994
Grid reference	P05 953 473
Area	4.4 ha
Altitude	150-220 m asl

### ***Ecological unit***

- (a) Puriri-taraire forest in volcanic crater (90%)
- (b) Mamaku-hangehange shrubland in volcanic crater (10%)

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

A small forest remnant within the crater of a basaltic volcanic cone (Pouerua).

### ***Vegetation***

The dominant vegetation of puriri-taraire forest includes frequent kohekohe and karaka with occasional totara and *Griselinia lucida*.

Stock have access to the site, and gorse forms the periphery.

### ***Fauna***

The site contains the Northland endemic snails *Liarea turriculata turriculata* and "Golden phenacohelix".

### ***Significance***

Constitutes a nationally rare ecological association of broadleaf forest and crater landform. Type (b) is also the only example of its type recorded in the Ecological District during this survey.

The Pouerua scoria cone is a distinctive volcanic centre with a well preserved crater and volcanic form, surrounded by the best preserved lava flow in Northland. It is the largest pa and stone fields prehistoric site remaining in New Zealand (Kenny & Hayward 1993).

Figure 55. Pouerua Cone, P05/044

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

### **POUERUA BUSH**

Survey no. P05/045  
Survey date 22 December 1995  
Grid reference P05 950 460  
Area 71 ha  
Altitude 120-160 m asl

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

- (a) Puriri-titoki forest on volcanic flats
- (b) *Eucalyptus* sp. plantation on volcanic flats

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

On the surface of a Kerikeri volcanic basalt flow with no soil cover.

#### ***Vegetation***

A moderate-sized old growth volcanic broadleaf remnant.

Canopy species associated with the dominant (c. 90%) forest type (a), including frequent rewarewa, kohekohe and taraire, with occasional mangaeo, karaka, whau, totara, rimu, northern rata, kowhai and tawa. Stock have largely been excluded by the difficult rocky ground cover which supports a dense cover of *Asplenium lamprophyllum* and *Peperomia urvilleana*.

Figure 56. Pouerua Bush, P05/045

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

f = forest.

#### Significant flora

The Vulnerable creeping twiner mawhai (*Sicyos australis*) now more or less confined to offshore islands and the nationally uncommon *Peperomia tetraphylla* (Naturally Uncommon-Sparse).

Other noteworthy species include the regionally uncommon mangaeo and whau, the later being a coastal species which, along with *Coprosma macrocarpa* and wharangi, give this site a coastal element not known elsewhere as far inland as this (c. 18 km to the closest tidal reaches of the Bay of Islands and c. 25 km to the open ocean).

It is also one of only a few Northland sites for stinging nettle (*Urtica ferox*).

#### **Fauna**

Common bush birds and kukupa (Category B threatened species).

#### **Significance**

A unique site within this Ecological District and Region, old growth broadleaf forest on a volcanic geomorphic base. It is similar to only one other site within the Kaikohe Ecological District (P05/050 Kahutoto Stream Remnant), but each site has its unique characteristics.

Outstanding botanical values, including threatened species.

Habitat for threatened fauna.

## LAKE OWHAREITI AND JACKS LAKE

Survey no. P05/046  
Survey date 13 February 1995  
Grid reference P05 960 455  
Area 124.4 ha  
Altitude c. 100 m asl

### ***Ecological unit***

- (a) *Eleocharis* sedgeland on margins
- (b) Raupo reedland on margins
- (c) Open water in lakes

Figure 57. Lake Owhareiti and Jacks Lake, P05/046  
Each grid is 1000 m × 1000 m and equals 100 ha.  
w = wetland.

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

Two lakes ponded by Kerikeri volcanic basalt flows and banded in the upper catchments of Jacks Lake by Motatau Complex glauconitic sandstone and, for Lake Owhareiti, Mangakahia Complex mudstone.

### ***Vegetation***

Limited to marginal vegetation which is being grazed by stock. Occasional *Baumea articulata* is associated with type (a).

### ***Fauna***

As least 23 species of avifauna are known to use these lakes, including NZ dabchick (Category C threatened species), Australasian bittern (Category O threatened species), the regionally significant NI fernbird, and little black shag, NZ scaup, grey teal, Australian coot, Australian little grebe, NZ shoveler, Canada goose and cattle egret. It is an important site for moulting paradise shelduck, an endemic species, which can number up to 1000 during early summer, and, for black swan, these lakes support the major resident population for Northland. Both lakes exhibit similar waterfowl usage relative to their size.

### ***Significance***

Rare ecosystems in the regional context and the most important waterfowl habitat in the Ecological District, supporting threatened and regionally significant fauna as well as 20 other species.

It also contains one of only three examples of type (a) recorded in the Ecological District during this survey.

## **NGAWHITU BUSH**

Survey no.	P05/047
Survey date	8 February 1995
Grid reference	P05 955 440
Area	125.2 ha (forest 92.7 ha; shrubland 32.5 ha)
Altitude	120-187 m asl

### ***Ecological unit***

- (a) Taraire forest on hillslope (50%)
- (b) Manuka shrubland on hillslope (15%)
- (c) Kahikatea forest on alluvial flats (30%)
- (d) Totara-kahikatea forest on hillslope (5%)

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

On dissected hill country and alluvial flats underlain by Motatau Complex glauconitic sandstone and Mangakahia Complex mudstone.

### ***Vegetation***

Fragmented cutover and secondary forest remnants often linked by shrubland.

Canopy species associated with forest type (a) Taraire forest include tanekaha, totara, puriri and kahikatea with occasional matai, rimu, titoki, pukatea and tawa.

Mamaku is associated with type (b) Manuka shrubland, which links four pockets of forest.

Figure 58. Ngawhitu Bush, P05/047

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

s = shrubland; f = forest.



Type (d) Totara-kahikatea forest includes occasional rimu.

### ***Fauna***

Common forest birds and kauri snail (Category C threatened species).

### ***Significance***

Its representative significance, size and partial linkage function between the native/exotic mosaic of the Titihuatahu area and the Opuia-Moerewa Forest tract constitute its most significant known attributes.

Some 30% of this site is kahikatea dominant (type (c)) on flat to rolling country, a forest type which is now considered rare nationally and in Northland has been reduced to less than 1% of its original area. This site represents the only example of taraire forest on this geological base and is also a representative site for types (c) and (d).

Habitat for kauri snail.

## **KAHUTOTO STREAM REMNANT**

Survey no.	P05/050
Survey date	20 February 1995
Grid reference	P05 970 497
Area	8 ha
Altitude	60-80 m asl

### ***Ecological unit***

- (a) Kahikatea on alluvial flats
- (b) Titoki-taraire-mahoe on volcanic flats
- (c) Titoki-karaka-mahoe on volcanic flats
- (d) Willow-*Carex* association in swamp
- (e) Raupo reedland in swamp
- (f) Mahoe-boxthorn-gorse-*Muehlenbeckia* shrubland on volcanic flats

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

Sited on a Kerikeri volcanic basalt flow.

### ***Vegetation***

This site is an old growth and secondary forest remnant with peripheral wetland and shrubland. It contains jumbled rock piles similar to that found with Pouerua Bush c. 4 km to the south, but the forest types differ.

The secondary kahikatea stand of type (a) is very small and includes occasional totara and rewarewa.

The dominant vegetation type is type (b) Titoki-taraire-mahoe forest and includes matai and karaka with occasional emergent northern rata, kowhai, rewarewa and tawa.

Type (c) Titoki-karaka-mahoe forest, the second most common type includes red mapou.

Type (d) Willow-*Carex* association includes wheki with occasional raupo, kotukutuku, *Coprosma propinqua* and cabbage tree.

Figure 59. Kahutoto Stream Remnant, P05/050  
Each grid is 1000 m × 1000 m and equals 100 ha.  
f = forest.

Type (e) Raupo reedland includes occasional cabbage tree and crack willow.

Type (f) Mahoe-boxthorn-gorse-*Muehlenbeckia* shrubland, a valuable buffer zone, includes bracken and mapou with occasional tobacco weed and cabbage tree.

Unfortunately, wandering willie (*Tradescantia fluminensis*) is well established in the northern half of this site, and stock are given access occasionally during winter, further aggravating the weed problem.

#### Significant flora

Its kawakawa dominant understorey with common *Peperomia urvilleana*, contains coastal species such as *Coprosma macrocarpa*, and wharangi, as well as three sparsely distributed divaricating species: milktree, kaikomako and extremely large *Lophomyrtus obcordata* (up to 250 mm through at the base).

Ground cover includes three fern species, which, while widespread, are not commonly found in most forest areas in the Far North: *Asplenium lamprophyllum*, *Arthropteris tenella* and *Pellaea rotundifolia*.

#### **Fauna**

An Australasian bittern (Category O threatened species) was noted just outside the boundary on swampy ground and it is possible that this site is utilised by them on occasions. Common forest birds are present.

### ***Significance***

Outstanding in representative terms as this remnant constitutes a unique assemblage of geomorphology and flora, being the only known examples in the Ecological District and region of types (b), (c) and (f). The most similar site recorded during this survey was the Pouerua Bush site, but this area has a greater diversity of habitat and vegetation types (including wetlands), as well as flora species.

### **PUKETOTARA/PATUKAUWAE/TE KEENE STREAM SWAMP**

Survey no.	P05/064
Survey date	20 February 1995
Grid reference	P05 978 509
Area	25.3 ha (forest 5.7 ha; swamp forest 12.2 ha; wetland 7.4 ha)
Altitude	60-80 m asl

### ***Ecological unit***

- (a) Crack willow treeland in swamp
- (b) Kahikatea swamp forest on alluvial flats
- (c) Raupo reedland in swamp
- (d) Manuka-*Coprosma propinqua* swamp shrubland on alluvial flats

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

A moderately large mineralised wetland on an alluvial floodplain associated with the Puketotara and Patukauwae Streams.

### ***Vegetation***

All identified vegetation types are close to monocultural in structure, with only type (d) having appreciable associated species which include cabbage tree, *Baumea articulata* and occasional kahikatea. Occurring in the understorey are an abundance of small-leaved coprosmas, *Carex* sp., flax, *Polygonum* sp., watercress and the introduced swamp grass *Glyceria maxima*.

The riparian ribbon of crack willow which extends up and downstream from this site, while having considerable waterfowl habitat value to species such as grey duck, are not included in this site due to crack willow's exotic invasive status.

Stock access is restricted by the river and the wet substrate.

### ***Fauna***

At least nine waterfowl or water-related bird species have been identified within this site, including Australasian bittern (Category O threatened species), spotless crane (regionally significant species), and grey duck. Common forest birds also utilise the site.

### ***Significance***

Contains representation of several threatened habitat types including mineralised wetland, swamp forest and swamp shrubland, and outside of the Kaipeha Swamp, is one of the largest wetlands in the Ecological District. It contains the only known examples in the Ecological District of types (b) and (d) and is a representative site for type (c).

Figure 60. Puketotara/Patukauwae/Te Keene Stream Swamp, P05/064

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

f = forest; w = wetland.

This site and another fertile wetland to the east may perform a linking function for the dispersal/movement of wetland species between the important Motatau-Pokapu wetland complex and those of the Waitangi Forest complex.

Habitat for threatened and regionally significant species.

## **WAIKARAMU ROAD BUSH**

Survey no.	P05/066
Survey date	17 February 1995
Grid reference	P05 915 510
Area	251.2 ha
Altitude	80-232 m asl

### ***Ecological unit***

- (a) Totara-taraire-puriri forest on hillslope (30%)
- (b) Totara-rimu forest on hillslope (<5%)
- (c) Bracken-manuka shrubland on hillslope (60%)
- (d) Totara forest on hillslope (<5%)
- (e) Raupo reedland in swampy valley (<2%)

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

Within steeply dissected Mangakahia Complex siliceous mudstone valleys below a basalt escarpment, probably with some talus in the valleys.

### ***Vegetation***

A large secondary forest, wetland and shrubland mosaic.

Type (a) Totara-taraire-puriri forest contains as associated canopy species, kahikatea and rewarewa and occasional karaka, titoki, rimu, pukatea and kohekohe.

Type (b) Totara-rimu forest, a minor component in terms of area, includes kahikatea and tanekaha with occasional rewarewa.

Type (c) Bracken-manuka shrubland is the dominant type, constituting c. 60% of the area, and contains hangehange and occasional gorse.

Type (d) Totara forest includes occasional kahikatea.

Type (e) Raupo reedland includes flax, *Carex* and cabbage tree.

Portions of the older growth element are fenced from stock.

### ***Fauna***

NI brown kiwi in high numbers (Category A threatened species) and kukupa (Category B threatened species, and kauri snail (Category C threatened species). A large native galaxiid which is likely to be banded kokopu (Category C threatened species) has been reported.

### ***Significance***

A representative site for type (a) and the only example known in the Ecological District of types (b) and (c).

Its large size enhances its importance as habitat for the threatened species, kiwi and kukupa.

Its central location between large forest blocks suggests a linking role for species with moderate powers of dispersal.

An upper catchment/riparian protection function is implied.

It includes 13 ha protected under covenant with the Queen Elizabeth II National Trust.

Figure 61. Waikaramu Road Bush, P05/066

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

s = shrubland; f = forest.

## WAIMATE BROADLEAF REMNANTS

Survey no.	P05/067
Survey date	17 February 1995
Grid reference	P05 904 524
Area	37.1 ha
Altitude	c. 200 m asl

Figure 62. Waimate Broadleaf Remnants, P05/067  
Each grid is 1000 m × 1000 m and equals 100 ha.  
f = forest.

### ***Ecological unit***

(a) Puriri forest on volcanic flats

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

Kerikeri volcanic basalt flow and eruptive centre remnants (Eruptive Centre - Pahangahanga Pa).

### ***Vegetation***

Nine fragmented old growth volcanic broadleaf forest remnants.

The strongly puriri dominant forest type has as associated canopy species occasional taraire, rewarewa, totara and rimu.

Unfortunately, many of these remnants are suffering from the symptoms of fragmentation, increased exposure to the effects of frost and wind, and this, in conjunction with a lack of regeneration as a result of stock browsing, has begun to manifest itself as early stages of canopy collapse. Without the regeneration afforded by ring fencing, these remnants will disappear and the process is already well under way. However, some remnants have been fenced and are showing good regeneration of canopy species.

### ***Fauna***

Kukupa (Category B threatened species).

### ***Significance***

Puriri dominant volcanic broadleaf forest is a nationally rare vegetation type unique to the North Island, and these remnants are some of the best remaining examples in this Ecological District and Region of a once common forest type which was associated with the basaltic lava flows in this area.

Habitat for threatened species.

Includes two Queen Elizabeth II National Trust covenants, one of 6 ha and the other of approximately 3 ha.

## **WAIKUKU ROAD BUSH**

Survey no.	P05/068
Survey date	17 February 1995
Grid reference	P05 885 525
Area	174.4 ha (forest 94.4 ha; shrubland approx. 80 ha)
Altitude	100-260 m asl

### ***Ecological unit***

(a) Puriri forest on volcanic flats

(b) Taraire-puriri forest on hillslope

(c) Towai forest on hillslope

(d) Kahikatea-totara forest on hillslope

(e) Totara forest on hillslope

(f) Manuka shrubland on hillslope



Figure 63. Waikuku Road Bush, P05/068

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

s = shrubland; f = forest.

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

It is underlain by Kerikeri volcanic basaltic plateau remnants in the east with Mangakahia Complex siliceous mudstone in the vicinity of Okuratope Pa and mudstone west of Waikuku Stream forming the dissected hill country of the valley system.

### ***Vegetation***

A large secondary forest and shrubland remnant with areas of cutover older growth forest in places.

Type (a) Puriri forest includes occasional taraire, kahikatea and rewarewa.

Type (b) Taraire-puriri forest includes rewarewa with occasional miro and rimu.

Type (c) Towai forest includes kahikatea, rimu and kauri with occasional northern rata, kanuka, pukatea and puriri.

Type (d) Kahikatea-totara forest includes rimu and occasional kauri, pukatea and puriri.

Type (e) Totara forest includes occasional rimu, puriri, taraire, kahikatea and towai.

The manuka shrubland of type (f) includes frequent towai, locally frequent tobacco weed and mamaku, and occasional pate. Stands of emergent kahikatea are local (Kingett-Mitchell).

An exotic plantation forest links some of the area.

Significant flora

The regionally uncommon black maire is present.

### ***Fauna***

NI brown kiwi (Category A threatened species) and kauri snail (Category C threatened species).

### ***Significance***

Contains one of only three examples of puriri forest on volcanic soils recorded in the Ecological District during this survey, and is a representative site for type (f).

It includes the 22.5 ha Okuratope Pa Historic reserve and four small areas of puriri forest totalling 2 ha protected under Queen Elizabeth II National Trust covenant.

Habitat for threatened and regionally significant species.

Its central location suggests a possible linking role between large forest blocks. The site also performs upper catchment and riparian protection functions.

## **BULLMAN ROAD BROADLEAF REMNANTS**

Survey no. P05/069  
Survey date 17 February 1995  
Grid reference P05 858 517  
Area 18.8 ha  
Altitude 200-250 m asl

### ***Ecological unit***

- (a) Puriri forest on volcanic flats (95%)
- (b) Totara forest on volcanic flats (5%)

Figure 64. Bullman Road Broadleaf Remnants, P05/069

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

f = forest.

***Landform/geology***

On a Kerikeri volcanic basalt flow.

***Vegetation***

Scattered remnants of mainly old growth volcanic broadleaf and secondary podocarp forest.

Canopy species associated with the dominant forest type (a) includes taraire with occasional rewarewa, kahikatea and karaka.

Type (b) includes puriri and occasional rewarewa.

The same situation of potential for canopy collapse exists for these remnants as is already described for the Waimate Broadleaf Remnants (P05/067). Without fencing there will be no opportunity for replacement of senescent canopy trees, and the complete loss of these remnants becomes inevitable.

***Fauna***

Not surveyed.

***Significance***

Representative of a rare ecological association - old growth volcanic broadleaf forest - being one of only three examples recorded in the Ecological District.

Potential for high usage by kukupa, particularly in the summer months is likely, making these remnants an important seasonal food source.

**LAKE OMAPERE SWAMP FOREST REMNANT**

Survey no.	P05/070
Survey date	18 February 1995
Grid reference	P05 845 511
Area	3.7 ha
Altitude	240 m asl

***Ecological unit***

- (a) Kahikatea-pukatea swamp forest on alluvium
- (b) Totara-kanuka forest on headland

***Landform/geology***

Underlain by basalt flows and alluvium on the lake edge.

***Vegetation***

A young secondary forest remnant adjoining Lake Omapere and a smaller older growth swamp forest remnant also on the lake margin.

Figure 65. Lake Omapere Swamp Forest Remnant, P05/070

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

f = forest.

Associated species of type (a) include occasional swamp maire, cabbage tree, kiekie and totara, but the remnant is so small and degraded that no “canopy” structure exists. However, the complete lack of any other marginal swamp forest makes this remnant of importance as a potential seed source for any protected marginal land in the vicinity.

Type (b) includes rewarewa and the occasional puriri and towai.

### ***Fauna***

Important roosting and breeding sites for the large black shag colony which is centred around Lake Omapere.

### ***Significance***

Type (a) represents one of only two examples of this type recorded within the Ecological District and these sites are representative of riparian lake vegetation which now extends no more than 16-17 hectares in total. They are significant as seed sources and nuclei for any future restoration of lakeside vegetation.

Contains a significant black shag breeding colony.

## **WEHIRUA ROAD BUSH**

Survey no. P05/071  
Survey date 17 February 1995  
Grid reference P05 846 536  
Area 65.5 ha  
Altitude 180-260 m asl

### ***Ecological unit***

- (a) Towai forest on hillslope (60%)
- (b) Totara forest on hillslope (c. 30%)
- (c) Taraire-puriri forest on hillslope (10%)
- (d) Totara-puriri forest on hillslope (<2%)

Figure 66. Wehirua Road Bush, P05/071

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

s = shrubland; f = forest.

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

Secondary forest on Kerikeri volcanic basalt plateau remnant on the high ground with valleys of dissected Mangakahia Complex siliceous mudstone, probably with basalt talus below.

### ***Vegetation***

The dominant towai forest type (a) includes kahikatea and totara with occasional puriri, mamaku tree fern, kauri and rewarewa.

Type (b) Totara forest includes kahikatea with occasional towai, puriri and rewarewa.

Type (c) Taraire-puriri forest includes totara and rewarewa.

Type (d) Totara-puriri forest includes taraire and rimu with occasional kahikatea, towai and rewarewa.

### ***Fauna***

Its close proximity to a moderately large forest block to the north-east which is known to contain NI brown kiwi (Category A threatened species) suggests that it may also support kiwi.

### ***Significance***

Representative of type (a), being the largest area of this vegetation type on a variety of rock types.

A partial linkage role between the Upper Waitangi River Catchment and the Whakanekeneke/Aratoro catchments, as well as providing upper catchment/riparian protection functions.

Likely to contain a threatened species.

## **HUI TE WERAWERA STREAM BUSH**

Survey no.	P05/073
Survey date	18 February 1995
Grid reference	P05 880 560
Area	987.6 ha (forest 487.6 ha; shrubland 500 ha)
Altitude	70-305 m asl

### ***Ecological unit***

- (a) Manuka/kanuka-totara forest on hillslope
- (b) Manuka/kanuka-towai forest on hillslope
- (c) Towai forest on hillslope
- (d) Totara-towai-taraire forest on hillslope
- (e) Totara-kahikatea forest on steep and rolling hillslopes
- (f) Manuka-gorse shrubland on gentle hillslopes

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

Underlain in the north-west by a Kerikeri volcanic basalt flow. In the dissected valleys Mangakahia Complex sandstone, mudstone and siliceous mudstone underlie basalt talus which has eroded from the basalt escarpment.

Figure 67. Hui te Werawera Stream Bush, P05/073  
Each grid is 1000 m × 1000 m and equals 100 ha.  
s = shrubland; f = forest.



### ***Vegetation***

A large and increasingly fragmented secondary forest remnant in an early successional stage. Associated canopy species for type (a) includes mamaku and kahikatea with occasional puriri and rimu.

Type (c) includes totara with occasional rimu, rewarewa, tanekaha and kahikatea.

Type (d) Totara-towai-taraire forest (P05 876 575) with scattered rewarewa and kohekohe and sparse understorey. Northern rata saplings epiphytic on towai are present (Kingett-Mitchell.)

Type (e) Totara-kahikatea forest includes puriri, towai and rimu with scattered pole kauri, tanekaha and mamaku (Kingett-Mitchell).

Type (f) Manuka-gorse shrubland on gentle hillslopes includes occasional cabbage tree, mamaku, totara and kahikatea.

### ***Fauna***

NI brown kiwi (Category A threatened species), kukupa (Category B threatened species), kauri snail (Category C threatened species).

### ***Significance***

A representative site for types (a), (d) and (e), and one of only three examples of type (b) in the Ecological District.

An important habitat for threatened fauna.

Its large size and central location between other large forests makes it of considerable importance to the maintenance of species diversity in the area, and potentially important to the movement of species with limited powers of dispersal.

The large vegetated area of the upper catchment of the Waitangi River contributes considerably to protection of water and soil values.

## **D COOKS BUSH**

Survey no.	P05/074
Survey date	18 February 1995
Grid reference	P05 925 567
Area	62.8 ha (forest 56.1 ha; shrubland 6.7 ha)
Altitude	60-100 m asl

### ***Ecological unit***

(a) Kahikatea-totara forest on hillslope

(b) Manuka/kanuka shrubland on hillslope

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

On dissected Mangakahia Complex mudstone hill country with a Kerikeri volcanic basalt flow remnant in the north-west.

### ***Vegetation***

A secondary forest remnant (c. 70%) with advanced shrubland (c. 30%).

Associated canopy species of type (a) includes local pole kahikatea occasional puriri, rimu, emergent kahikatea, rimu and kauri.

Figure 68. D Cooks Bush, P05/074

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

s = shrubland; f = forest.

Type (b) includes totara with occasional puriri, taraire, towai, rimu, kahikatea and rewarewa. In the west, kahikatea occurs frequently.

### ***Fauna***

NI brown kiwi (Category A threatened species) in moderate numbers, and kukupa (Category B threatened species).

### ***Significance***

A representative example of type (a).

Its close proximity to and location between the large forest remnant of Hui te Werawera Stream and the forests of Opuia and Waitangi suggests potential for a linkage function and good viability for the site.

Habitat for threatened species.

## **ATKINS/OHAIO BUSH**

Survey no. P05/075  
Survey date 18 February 1995  
Grid reference P05 936 560  
Area 26.2 ha  
Altitude 70-120 m asl

### ***Ecological unit***

- (a) Kahikatea forest on gentle hillslope
- (b) Totara forest on hillslope

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

Underlain by a Kerikeri volcanic basalt flow forming an escarpment on the north side of Okokako Road with basalt talus overlying Mangakahia Complex mudstone in the lower valley slopes and alluvium forming the valley floor of the Waitangi River.

### ***Vegetation***

Two secondary forest remnants. Associated canopy species of Type (a) include frequent rimu, puriri and totara.

Type (b) includes frequent kahikatea and puriri with occasional kauri, tawa and rimu.

Figure 69. Atkins/Ohaio Bush, P05/075

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

f = forest.

As with many small forest remnants, stock browsing has reduced the understorey to a mere scattering of the less palatable species and regeneration of canopy species is not occurring.

### ***Fauna***

NI brown kiwi (Category A threatened species).

### ***Significance***

Habitat for threatened species.

A representative site for type (a) due to the conspicuous rimu component.

These remnants may perform a linking role between larger forest blocks to the east and west.

## **TAUANUI VOLCANIC LAKE AND ENVIRONS**

Survey no.	P06/007
Survey date	14 July 1994
Grid reference	P06 890 330
Area	58 ha (forest 48.5; lake 10 ha)
Altitude	350-420 m asl

### ***Ecological unit***

- (a) Kahikatea forest in volcanic cone (<5%)
- (b) Taraire-towai forest in volcanic cone (c. 80%)
- (c) Taraire forest in volcanic cone (<5%)
- (d) Open water in lake (15%)

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

A moderately sized forest remnant adjoining a small lake within a volcanic basalt cone. It is on moderately steep Tangihua complex and Taheke basalt, the lake being ponded by the basalt cone and lava flows.

### ***Vegetation***

The forest canopy appears to be quite intact with a substantial emergent element. Associated canopy species include:

Type (a) Kahikatea forest - occasional totara.

Type (b) Taraire-towai forest - puriri, tawa, kahikatea with occasional emergent northern rata, matai and rimu, pukatea, kohekohe, nikau, karaka, miro, totara, hinau and mangao (*Litsea calicaris*).

Type (c) Taraire forest - occasional karaka and puriri.

Unfortunately, stock have access to the entire block and the understorey is severely modified.

The lake contains the exotic water weeds *Elodea canadensis* and a small patch of *Lagarosiphon major* which should be eradicated.

Significant flora

Mangao (regionally significant) is a species of limited distribution in Northland.

### ***Fauna***

Wildlife usage is high due to the dual forest/lake ecosystems. Fauna include common forest birds and kukupa with waterfowl including black swan, little

Figure 70. Tauanui Volcanic Lake and Environs, P06/007

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

f = forest; w = wetland.

shag, mallard duck, NZ shoveler duck, paradise shelduck and black shag (breeding colony).

Invertebrate fauna includes kauri snail (Category C threatened species) and the endemic (to Northland) land snails *Liarea turriculata* and *Fectola charopiformis*. Perch (*Perca fluviatilis*) are present within the lake.

### ***Significance***

The site is one of the most important representative sites in the Ecological District and Region, being a unique assemblage of geomorphic and biological components - broadleaf-podocarp forest on a volcanic cone including a regionally significant plant species.

Important habitat for waterfowl, threatened and endemic fauna.

## TAUANUI VOLCANIC BROADLEAF REMNANT

Survey no. P06/008  
Survey date 14 July 1994  
Grid reference P06 891 346  
Area 14.9 ha  
Altitude c. 170 m asl

### *Ecological unit*

(a) Taraire-puriri on gentle hillslope

### *Landform/geology*

Gently sloping Taheke Basalt lava flow which is underlain by Mangakahia Complex sand and mudstone.

Figure 71. Tauanui Volcanic Broadleaf Remnant, P06/008

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

f = forest.

### ***Vegetation***

Seven scattered forest remnants between 2 and 5 ha each of volcanic broadleaf, which is now a rare forest type in Northland. None of the remnants is fenced and there is a resultant lack of understorey and regeneration. Possum damage is evident, especially on the highly palatable kohekohe.

Associated species include occasional rewarewa, karaka, totara and kohekohe. This combination of small unfenced fragmented remnants on an exposed site which is under pressure from browsing and grazing animals will eventually result in total canopy collapse. Fencing is justified because of the scarcity of this forest type.

### ***Fauna***

Not surveyed.

### ***Significance***

Representative of the only example in this Ecological District of this forest type/geomorphic assemblage.

An important habitat type for kukupa.

## **PUNAKITERE VALLEY SWAMP FOREST**

Survey no.	P06/010
Survey date	28 April 1994
Grid reference	P06 882 368
Area	138.7 ha (forest 22.7 ha; shrubland 116 ha)
Altitude	c. 130 m asl

### ***Ecological unit***

- (a) Kohuhu-manuka-putaputaweta shrubland on alluvium (<2%)
- (b) Kahikatea forest on alluvium (15%)
- (c) Manuka shrubland on low hills/alluvium (>80%)

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

The manuka dominant shrubland is on either an alluvial or volcanic base. Both the alluvium and Taheke Basalt lava flow are underlain by Mangakahia Complex sandstone and mudstone.

### ***Vegetation***

Fragmented alluvial forest and shrubland remnants dominated by secondary kahikatea, manuka and kohuhu.

The area dominated by (a) Kohuhu-manuka-putaputaweta shrubland, above is very unusual, sharing the canopy with cabbage tree and kahikatea, but is also very small - less than 2 ha.

Type (b) Kahikatea forest contains frequent cabbage tree and manuka.

Type (c) Manuka shrubland - occasional gorse is present.

### ***Fauna***

Not surveyed.

Figure 72. Punakitere Valley Swamp Forest, O05/078

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

s = shrubland; f = forest.

***Significance***

Scarcity of forest/shrubland on these geological bases makes all of the vegetation types representative of a very uncommon association in the Ecological District and Region. It is the only example of type (a) known in the Ecological District, and is the largest area of type (b), and representative site for type (c).



## KAIPEHA SWAMP

Survey no.	P06/018
Survey date	1 May 1994
Grid reference	P06 780 340
Area	872.8 ha (forest 85.9 ha; shrubland 469.3 ha; swamp forest 25.3 ha; wetland 292.3 ha)
Altitude	c. 50-120 m asl

### *Ecological unit*

- (a) Raupo reedland in swamp
- (b) Manuka-flax association in swamp
- (c) *Baumea* sedgeland in swamp
- (d) Kanuka-kowhai forest on alluvium
- (e) Kanuka-kahikatea forest on alluvium
- (f) Kanuka-totara forest on gentle hillslope
- (g) Manuka-*Baumea* association in bog
- (h) Kahikatea-cabbage tree swamp forest on alluvium

### *Landform/geology*

The valley swamps have been ponded by Taheke Basalt lava flow and the hill country catchment is underlain by Mangakahia Complex sedimentary rocks.

### *Vegetation*

A large freshwater wetland with peripheral swamp forest and secondary hill forest. The boundary is shrinking from the north with the clearance of one of the rarest elements of this system - kahikatea dominant swamp forest - from the Punakitere River flood plain.

To the south of the river, access and drainage are more difficult to achieve, but modification through periodic burning and stock access have continued to impact on natural values. Fertility of wetland types varies considerably from highly mineralised raupo-cabbage tree swamp to acidic bog dominated by *Baumea* and manuka.

Associated canopy species include:

Type (a) Raupo reedland - occasional cabbage tree, kahikatea and manuka.

Type (b) Manuka-flax association - raupo with occasional cabbage tree.

Type (c) *Baumea* sedgeland - occasional manuka and cabbage tree.

Type (d) Kanuka-kowhai forest - kahikatea with occasional rimu, titoki, taraire, totara and rewarewa.

Type (e) Kanuka-kahikatea forest - occasional rimu.

Type (f) Kanuka-totara forest - kahikatea with occasional karaka, kowhai and rimu.

Type (g) Manuka-*Baumea* association - occasional puriri and swamp maire.

### *Fauna*

NI brown kiwi (Category A threatened species), kukupa (Category B threatened species), Australasian bittern (Category O threatened species), NI fernbird and spotless crane (regionally significant species), and kauri snail (Category C threatened species).

Figure 73. Kaipēha Swamp, P06/018  
Each grid is 1000 m × 1000 m and equals 100 ha.  
s = shrubland; f = forest; w = wetland.

### ***Significance***

The largest freshwater wetland system in the Kaipēha Ecological District, and one of the largest in Northland, the Kaipēha Swamp and its associated forested and shrub-covered catchment constitute one of the most threatened, highly valued and poorly represented ecosystems in Northland.

The site exhibits a large range of fertility gradients and a diversity of vegetation associations with types (b), (c), (g) and (h) being the only examples of their types recorded in the Ecological District, and the site being representative of types (a), (e) and (f).

Habitat for several threatened species.

## **PUNAKITERE/NINIHI ROAD BUSH**

Survey no. P06/019  
Survey date 1 May 1994  
Grid reference P06 753 350  
Area 52.6 ha (forest 45.7; wetland 6.9 ha)  
Altitude 50-116 m asl

### ***Ecological unit***

- (a) Totara-taraire forest on hillslope (70%)
- (b) Totara-kahikatea forest on hillslope (20%)
- (c) Raupo reedland in swamp (10%)

Figure 74. Punakitere/Ninihi Road Bush, P06/019  
Each grid is 1000 m × 1000 m and equals 100 ha.  
f = forest; w = wetland.

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

Hill country and freshwater wetland associated with the larger Kaipaha wetland but separated from it by a narrow strip of semi-developed land. 90% of the site is underlain by Mangakahia Complex sandstone, the remainder being alluvium associated with the raupo dominant wetland at the north-eastern edge.

### ***Vegetation***

Associated canopy species include:

Type (a) Totara-taraire forest - puriri, pukatea, towai, rewarewa with occasional tanekaha and emergent rimu.

Type (b) Totara-kahikatea forest - towai, tanekaha with occasional rimu, taraire and rewarewa.

### ***Fauna***

Kauri snail (Category C threatened species).

### ***Significance***

Part of the Kaipaha Swamp biogeographic entity, and adds diversity of forest type to that site and provides a buffer to the larger area.

Type (a) is one of only four examples of its types recorded in the Ecological District.

Habitat for a threatened species.

## **KOROWHATA STREAM POND**

Survey no.	P06/080
Survey date	29 April 1994
Grid reference	P06 828 371
Area	6.7 ha
Altitude	c. 100 m asl

### ***Ecological unit***

(a) Open water - pond (95%)

(b) Raupo reedland on pond margin (<5%)

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

A low dam has been constructed across a swampy arm of the Korowhata Stream.

### ***Vegetation***

A shallow area of open water with shallow raupo dominant and herbfield margins. This situation, despite being artificially induced, has provided ideal waterfowl habitat.

### ***Fauna***

The landowner reports the presence of breeding NZ dabchick (Category C threatened species), Australasian bittern (Category O threatened species), with NZ shoveler duck and grey teal (both regionally uncommon) also utilising the site.

Figure 75. Korowhata Stream Pond, P06/080  
Each grid is 1000 m × 1000 m and equals 100 ha.  
s = shrubland; f = forest; w = wetland.

Raupo is actively controlled because of the shallow water and resultant potential for invasion, therefore crane habitat is minimal.

***Significance***

Despite being an artificial habitat, the site offers excellent breeding and feeding sites for many waterfowl, some species of which are threatened and others regionally uncommon.

**MANGATOA/PUNAKITERE RIVERINE**

Survey no.	P06/086
Survey date	2 July 1995
Grid reference	P06 730 378
Area	135.4 ha
Altitude	20-80 m asl

***Ecological unit***

- (a) Totara forest on alluvium (c. 90%)
- (b) Manuka/kanuka-totara forest on hillslope (10%)
- (c) Manuka-gorse-totara shrubland on hillslope (<2%)

Figure 76. Mangatoa/Punakitere Riverine, P06/086  
Each grid is 1000 m × 1000 m and equals 100 ha. f = forest.

***Landform/geology***

Secondary riverine forest and shrubland, with some low hill country adjoining the Mangatoa and Punakitere Rivers. Alluvial soils and Mangakahia Complex siliceous mudstone on the river banks.

***Vegetation***

Strongly totara and manuka/kanuka dominant vegetation. Associated canopy species include:

Type (a) Totara forest - occasional kauri, puriri, taraire, kahikatea, matai, rimu, kowhai.

Type (b) Manuka/kanuka-totara forest - occasional kohuhu.

***Fauna***

Not surveyed.

***Significance***

A representative site for type (a).

This site is important, along with any other remnant riparian forest, to the instream values of these rivers, which were once heavily wooded and are now devoid of most streamside cover, resulting in loss of soil (increased turbidity) and high summer temperatures affecting algal growth and oxygen availability.

## **TAUTORO WETLAND**

Survey no. P06/088  
Survey date 20 September 1995  
Grid reference P06 868-352  
Area 5.4 ha  
Altitude 80-100 m asl

### ***Ecological unit***

- (a) *Eleocharis* sedgeland in swamp
- (b) *Carex secta* sedgeland in swamp
- (c) Open water in pond

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

Swamp on small area of Mangakahia Complex mudstone exposed within an eroded area of Kerikeri volcanics basalt flow.

### ***Vegetation***

A small mineralised wetland remnant with substantial open water. Associated plants include:

Type (b) - occasional *Cyperus ustulatus*, *Juncus* sp. and *Baumea* sp.

Type (c) - occasional *Azolla filiculoides* and *Lemna* sp.

Figure 77. Tautoro Wetland, P06/088

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

w = wetland.

### ***Fauna***

Native water-related species include: grey duck, pukeko and welcome swallow. Spotless crane were not surveyed for, but are likely to be present.

### ***Significance***

Small, but diverse due to high water table and presence of open water. Representative of one of only three examples of type (a) known in the Ecological District and the only example of type (b). The *Carex secta* dominant type is rare in Northland.

Mangakahia Road and a stock race may be maintaining the high water table by impoundment.

## **WHAKARUANGANGANA GUMFIELD**

Survey no.	P06/089
Survey date	21 September 1995
Grid reference	P06 800-395
Area	131.7 ha
Altitude	100-208 m asl

### ***Ecological unit***

- (a) *Gleichenia-Schoenus-Baumea* association on gentle hillslope
- (b) Manuka-*Hakea* sp. shrubland on gentle hillslope
- (c) *Baumea-Gleichenia*-manuka shrubland on gentle hillslope
- (d) *Acacia* sp.-manuka in gully

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

Mangakahia Complex sandstone.

### ***Vegetation***

Type (a) consists of *Gleichenia dicarpa*, *Schoenus brevifolius*, and *Baumea teretifolia* with frequent *Epacris pauciflora* and *Tetraria capillaris*. Manuka and *Dracophyllum* are occasional.

Type (b) Manuka-*Hakea* sp. shrubland occurs on drier sites. Gorse and *Schoenus* are frequent with occasional kumerahou and bracken.

Type (c) *Baumea-Gleichenia*-manuka shrubland occurs in gullies. *Baumea rubiginosa* and *Gleichenia dicarpa* are abundant, with manuka common. Kiokio is frequent and gorse and bracken occasional.

### ***Fauna***

Not surveyed, but NI fernbird (regionally significant species) are usually associated with such sites.

### ***Significance***

Representative of a rare and diminishing vegetation type, this remnant gumfield is all that remains of a once-extensive vegetation type, which covered much of the less fertile land to the south and west of Kaikohe. Modern land development practices have destroyed all but the last vestiges of these “pipe clay” gumlands



Figure 78. Whakaruangangana, P06/089  
Each grid is 1000 m × 1000 m and equals 100 ha.  
s = shrubland.

which contain species such as orchids and sundews, which are often dependent on the harsh environmental conditions that prevail in such sites.

Type (a) is the only example of its type known in the Ecological District and type (c) is one of only two examples in the Ecological District, also being a nationally rare ecosystem type.

#### **KARAKAMATAMATA SCENIC RESERVE**

Survey no.	P06/091
Survey date	1982, 1997
Grid reference	P06 724 390
Area	12.6 ha
Altitude	40-80 m asl

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

- (a) Totara forest on hillslope
- (b) Taraire forest on hillslope and gully

Figure 79. Karakamatamata Scenic Reserve, P06/091  
Each grid is 1000 m × 1000 m and equals 100 ha.  
f = forest.

***Landform/geology***

Steep southwest-facing gully on Taheke basalt.

***Vegetation***

Type (a) is secondary growth and occurs on the upper margins.

Type (b) constitutes the majority of the site, with frequent kanuka and occasional puriri, totara, kahikatea, towai, rimu, tawa and kauri rickers.

Pockets of exotic weed species, including hakea, gorse and tobacco weed, occur on the margins. The area has pine plantations on the south and east sides.

***Fauna***

Kukupa (Category B threatened species). Kiwi are present two kilometres to the north (Guthries Block).

***Significance***

Habitat for threatened species.

The site is a Scenic Reserve administered by the Department of Conservation.

## 4.2 LEVEL 2 SITES

SITE	SURVEY NO.	GRID REF.
Waiare Road Pond	P05/004	P05 828 540
Lamberg Road Bush	P05/009	P05 766 558
Harrison Road Bush	P05/022	P05 756 494
Kopenui Stream Remnants	P05/036	P05 867 460
Ngaungau Pa Bush	P05/065	P05 940 520
Scott Road Remnants	P05/072	P05 846 554
Okokako Road Remnant	P05/076	P05 930 543
Utakura River Bush	P05/101	P05 770 504

### WAIARE ROAD POND

Survey no. P05/004  
 Survey date 25 May 1994  
 Grid reference P05 828 540  
 Area 1 ha  
 Altitude 260 m asl

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

- (a) Open water (c. 80%) in pond
- (b) *Eleocharis* sedgeland in margin

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

The pond lies on a basalt plateau remnant.

#### ***Vegetation***

A small pond, possibly constructed, surrounded by pasture and with a margin of *Eleocharis sphacelata* which has broadened out on the northern side.

#### ***Fauna***

Species known to utilise this pond include paradise shelduck, pied shag, white-faced heron and pukeko.

#### ***Significance***

A small example of type (b), which is uncommon in the Ecological District, but its values are limited by the lack of marginal ecotones and adjoining forest/shrubland. However, it does have some value for waterfowl.

Figure 80. Waiare Road Pond, P05/004

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

### **LAMBERG ROAD BUSH**

Survey no.	P05/009
Survey date	1 June 1994
Grid reference	P05 766 558
Area	14.2 ha
Altitude	70-110 m asl

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

(a) Totara-kahikatea forest on hillslope

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

A small secondary forest remnant on a north-facing hillside of Mangakahia Complex mudstone and Kerikeri volcanics.

#### ***Vegetation***

Canopy diversity is low with only occasional species including kohuhu, kauri and rimu associating with the totara-kahikatea domination. The site is unfenced, but further survey work may increase its known values.

#### ***Fauna***

Not surveyed.

Figure 81. Lamberg Road Bush, P05/009

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

***Significance***

Part of a chain of forest remnants which form a stepping stone linkage site but representative of secondary podocarp forest, uncommon in the Ecological Region.

**HARRISON ROAD BUSH**

Survey no.	P05/022
Survey date	19 May 1994
Grid reference	P05 756 494
Area	30 ha
Altitude	80-240 m asl

***Ecological unit***

- (a) Taraire forest on steep hillslope
- (b) Totara forest on steep hillslope
- (c) Manuka-totara-towai forest on steep hillslope

***Landform/geology***

A steep hill country valley of secondary and cutover forest underlain by Mangakahia Complex sandstone.

Figure 82. Harrison Road Bush, P05/022

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

### ***Vegetation***

This small forest remnant has as associated canopy species within type (a) rewarewa, towai and occasional puriri, totara, and *Griselinia lucida*. Emergent rimu is frequent.

Within type (b), associated species include puriri, kahikatea and towai, with occasional kauri, northern rata and rimu.

The abundance of rimu within type (a) above is noteworthy, especially considering the close proximity of Pukewharariki Forest - an area noted for the quality and diversity of its podocarp/kauri/hardwood forest.

### ***Fauna***

Not surveyed.

### ***Significance***

The emergent rimu element is uncommon in the Ecological District.

Its location implies a linking role between the large forests to the north and south. An upper catchment and riparian function is also implied.

## **KOPENUI STREAM REMNANTS**

Survey no. P05/036  
Survey date 14 February 1995  
Grid reference P05 867 460  
Area 18.6 ha  
Altitude c. 260 m asl

### ***Ecological unit***

- (a) Totara forest on hillslope (95%)
- (b) Taraire-puriri forest on hillslope (5%)

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

Underlain by a young Kerikeri volcanic basalt lava flow.

### ***Vegetation***

Two fragmented secondary forest remnants.

Canopy species associated with Type (a) include frequent puriri and occasional kahikatea, taraire, rewarewa and towai.

Type (b) includes towai with occasional totara.

### ***Fauna***

Not surveyed.

### ***Significance***

The taraire-puriri dominant portion is representative of the volcanic broadleaf forest which was once typical of forests of the volcanic plateau east of Lake Omapere, but which is now rare. The smallness of the area of this ecological unit limits its significance.

Some riparian buffering function is implied.

Figure 83. Kopenui Stream Remnants, P05/036

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

f = forest.



## **NGAUNGAU PA BUSH**

Survey no.	P05/065
Survey date	17 February 1995
Grid reference	P05 940 520
Area	13.3 ha
Altitude	70-100 m asl

### ***Ecological unit***

(a) Totara-kahikatea forest on hillslope

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

Underlain by Mangakahia Complex mudstone.

### ***Vegetation***

A small, fragmented, secondary podocarp forest remnant.

Associated canopy species include occasional kauri, puriri, rimu and taraire.

### ***Fauna***

Not surveyed.

### ***Significance***

Shows vigorous podocarp regeneration and is potentially a seasonal food source for kukupa.

Its location provides for a linkage function which may exist between the large forest remnants to the north-east of Lake Omapere and the large Opuia Forest to the east.

Figure 84. Ngaungau Pa Bush, P05/065

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

f = forest.

## **SCOTT ROAD REMNANTS**

Survey no. P05/072  
Survey date 18 February 1995  
Grid reference P05 846 554  
Area 18.3 ha  
Altitude 280-300 m asl

### ***Ecological unit***

(a) Totara forest on volcanic flats

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

Three secondary forest remnants on a Kerikeri volcanic basalt plateau remnant.

Figure 85. Scott Road Remnants, P05/072

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

f = forest.

### ***Vegetation***

The strongly totara dominant forest type has as associated canopy species taraire and puriri, with occasional towai, swamp maire, kahikatea, rimu and rewarewa.

### ***Fauna***

Not surveyed.

### ***Significance***

Their location suggests that they may perform a linking function between the moderately large Hui te Werawera Stream Bush to the east and the large tract of Puketi Forest and its outliers to the north and west.

May provide a seasonal food source for kukupa.

## **OKOKAKO ROAD REMNANT**

Survey no.	P05/076
Survey date	18 February 1995
Grid reference	P05 930 543
Area	8.4 ha
Altitude	130-180 m asl

### ***Ecological unit***

- (a) Totara-kahikatea-puriri forest on hillslope (80%)
- (b) Kahikatea forest on hillslope (20%)

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

Underlain by Kerikeri volcanic basalt flows on the margin of an eruptive centre (trig HA No. 2).

### ***Vegetation***

Two small forest remnants which are unfenced and suffering badly from the effects of unrestricted stock browse.

Associated canopy species of type (a) include occasional rimu, taraire and wattle.

Type (b) (c. 20%) includes totara.

Figure 86. Okokako Road Remnant, P05/076

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

f = forest.

***Fauna***

Common forest birds.

***Significance***

May perform an upper catchment protection and linkage function and act as a seasonal food source for kukupa.

Kahikatea forest is an uncommon vegetation type in the Ecological District but small in area.

## UTAKURA RIVER BUSH

Survey no. P05/101  
Survey date 3 May 1995  
Grid reference P05 770 504  
Area 51.7 ha (forest 18.2 ha; shrubland 33.6 ha)  
Altitude 80-250 m asl

### *Ecological unit*

- (a) Totara-manuka forest on hillslope (50%)
- (b) Totara-taraire-puriri forest on hillslope (40%)
- (c) Kahikatea forest on toeslope (5%)
- (d) Manuka shrubland on hillslope (5%)

Figure 87. Utakura River Bush, P05/101

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

s = shrubland; f = forest.

***Landform/geology***

South-facing catchments of secondary forest and shrubland underlain on the upper slopes by Kerikeri volcanic basalt flow remnant and associated talus downslope with Mangakahia Complex siliceous mudstone underlying the lower slopes.

***Vegetation***

Canopy species associated with type (a) above include bracken with occasional kahikatea and towai.

Type (b) includes occasional towai.

Totara occasionally occurs within the types (c) and (d).

***Fauna***

Not surveyed.

***Significance***

It is part of a mosaic of remnants which form a stepping stone linkage between Puketi Forest and Pukewharariki Forest.

## 5. Summary and Conclusions

A list of ecological units recorded in the Kaikohe Ecological District and their current protection status is set out in Table 2 (page 176) and a summary of the site evaluations is given in Table 3 (page 188).

TABLE 1. PROTECTED NATURAL AREAS NETWORK IN THE KAIKOHE ECOLOGICAL DISTRICT (Area given in ha).

SITE	NO.	STATUS					TOTAL
		QEII	SL	SR	SciR	OTHER	
Pukewharariki	P05/024		817				817
Guthries	P05/025		201				201
Mangatoa	P05/026		71.6				71.6
Aratoro	P05/001		28.4 380.6	54.2			463.2
Scotts Rd Bush	P05/002		10				10
Lake Omapere	P05/006		5.5				5.5
Waikaraka Stream Bush	P05/007	20					20
Remuera Settlement Rd	P05/038		1.7				1.7
Reservoir Bush	P05/029	5		49.7		25	79.7
Titihuatahu	P05/032	137.83					137.83
Ngawha	P05/033	35.46	43		17.8		96.26
Waikaramu Rd Bush	P05/066	13					13
Waimate Broadleaf Remnants	P05/067	9					9
Waikuku Rd Bush	P05/068	2				22.5 HR	24.5
<b>TOTAL</b>		222.29	1558.8	103.9	17.8	47.5	<b>1950.29</b>

**Key:** QEII = Queen Elizabeth II National Trust covenant; SL = Stewardship Land; SR = Scenic Reserve; SciR = Scientific Reserve; HR = Historic Reserve.

Note that most of these sites are larger than the area currently protected. The total area covered by sites described in this report is 13,790 ha, only 14.14 % of which currently has legal protection.



## 5.1 PRIORITY NATURAL AREAS FOR PROTECTION IN THIS ECOLOGICAL DISTRICT

### 1. Nationally rare habitat types

- old growth podocarp/kauri forest
- gumlands at Ngawha (including Rakautoa and Titihuatahu), Aratoro and Whakaruangangana
- broadleaf forest on volcanic cones and substrates with unique plant assemblages (Pouerua Bush, Kahutoto Stream Bush and Tauanui Bush)
- puriri forest on volcanic soil (Waimate North, Bullman Road and Remuera Settlement Road)
- wetlands
  - Kaipaha Swamp (one of the largest wetlands in Northland)
  - rare mineralised swamp forest (Puketotara-Patukauwae-Te Keene, Waingaruru, Lake Omapere and Youngs Kahikatea Remnant)
  - swamp shrubland and riverine forest (Moehau, Rurunga Stream, Taheke River, Mareoroa Swamps, Mangatoa/Punakitere)
- volcanic lakes - Owhareiti, Jacks, Tauanui

### 2. Ecological Units not well represented in the Ecological District

Kaikohe Ecological District contains a large number of ecological units, with at least 100 different vegetation types being recorded. Many of the ecological units not well represented in the District occur within the habitat types considered a priority in (1) above, or within the sites identified as important for threatened plant and animal species in (3) below.

Additional sites which are a priority for protection because they contain ecological units not well represented in the Ecological District include:

- Broadleaf forest on uncommon landforms
  - Mihi Rd (karaka-taraire and kahikatea-totara forest on Te Kuiti Group & Akarana Group calcareous mudstone and sandstone)
  - Waikaraka Stream Bush (taraire-puriri and taraire-towai forest on limestone)
  - Otamarangi Bush (taraire-puriri-towai forest on Te Kuiti glauconitic sandstone)
- Containing a conspicuous titoki component
  - Taumataraire (also on an uncommon landform in the Ecological District, Motatau Complex glauconitic sandstone)
- Containing a conspicuous kowhai component
  - Horeke Rd East (also important for its nikau and puriri components)
  - Waihoanga Stream Forest Outlier

- Containing a conspicuous kauri component

Monument Bush, Waihoanga Rd Bush, Whitecliffs, Carrs/Waimahe Stream and Te Toke Stream.

### **3. Threatened species habitat**

#### ***Fauna***

Kiwi habitat, especially large sites such as Waikaramu Rd, Hui te Werawera, Scotts Rd, Whakanekeneke Bush, Aratoro, Whitecliffs, Motukiore and Wairere Stream.

Sites important for waterfowl include Lake Owhareiti and Jacks Lake, and Lake Tauanui, and Ngawha is important for mudfish.

#### ***Flora***

Sites containing threatened plants include Titihuatahu, Ngawha Springs, Ngawha Swamps, Aratoro, and Pouerua Bush. In addition, Pouerua Cone, Kahutoto Stream and Waikuku Rd contain uncommon species or assemblages.

TABLE 2. ECOLOGICAL UNITS RECORDED IN THE KAIKOHE ECOLOGICAL DISTRICT AND PROTECTED STATUS.

**Key:** SR = Scenic Reserve; SL = Stewardship Land; ScR = Scientific Reserve; QEII = Queen Elizabeth II National Trust covenant; HR = Historic Reserve; Pt = Partly protected; Blank = Unprotected; 2 = Level 2 site.

VEGETATION	SITE NO.	STATUS	SITE NAME	VOLCANIC	SEDIMENTARY	REP. SITE
<b>SHRUBLAND</b>						
Manuka shrubland	O05/076		Horeke Rd East		Mang. sand & mud	
	O05/084		Carrs/Waimahe Stream Bush		Mang.sand	
	O05/088		Moehau Wetland and Forest Remnant		Mang.sand; estuarine	
	P05/007		Waikaraka Stream Bush		Te Kuiti calc.mud & bioclastic sandy limestone bluffs; Akarana supergroup calc. mud & sand	Yes
	P05/021		Utakura Bush		Mang. sand & mud	
	P05/025	Pt SL	Guthrie's Block		Mang. sand & Ngatuturi mudstone	Yes
	P05/027		Monument Bush		Mang sand; alluvium in east	Yes
	P05/042		Taumatataraire Stream Bush	Kerikeri basalt flow	Motatau glau. sand	
	P05/047		Ngawhitu Bush		Motatau glau. sand & Mang. mud	Yes
	P06/010		Punakitere Valley Swamp Forest	Taheke basalt lava flow	Alluvium	Yes
	P05/014		Te Toke Stream Shrubland	Kerikeri basalt plateau (east) & talus	Mang. mud	Yes
	O06/005		Taheke River Wetlands	Taheke basalt flow (alluvium)		
	P05/017		Cooks Airstrip Block	Kerikeri basalt talus	Mang. mud	
	P05/035		Youngs Kahikatea Remnant	Kerikeri basalt flow		
	P05/101		Utakura River Bush	Kerikeri basalt flow remnant & talus	Mang. sil. mud lower slopes	
Manuka/kanuka shrubland	O05/080		Wairere Stream Forest Mosaic	Kerikeri basalt; talus	Mang.mud Okakari Stm	Yes
	O05/083		Pukewhao Forest Mosaic	Kerikeri basalt - trig	Mang. mud	
	O05/085		Motukiore Bush Association		Mang. sand	
	P05/068	Pt HR?	Waikuku Rd Bush	Kerikeri basaltic plateau remnants (east)	Mang. mud (west)	Yes
	P05/074		D Cooks Bush	Kerikeri basalt flow remnant in NW	Mang. mud	
Manuka/kanuka-mahoe shrubland	O05/085		Motukiore Bush Association		Mang. sand	Yes
Manuka-mamangitowai shrubland	P05/031		Rakautao Bush		Mang. mud	Yes
Manuka/kanuka-totara shrubland	P05/023		Waihoanga Bush	Kerikeri basalt & talus	Mang. mud	
	P05/027		Monument Bush		Mang. sand	
Manuka-gorse-totara shrubland	P06/086		Mangatoa/Punakitere Riverine		Mang. sil. mud & alluvium	

VEGETATION	SITE NO.	STATUS	SITE NAME	VOLCANIC	SEDIMENTARY	REP. SITE
Manuka-gorse shrubland	P05/073		Hui te Werawera Stream Bush	Kerikeri basalt (NW)	Mang. sand & mud under basalt talus (valleys)	
Gorse scrub	O05/085		Motukiore Bush Association		Mang. sand	
Manuka- <i>Hakea</i>	P06/089		Whakarungangana Gumfield		Mang. sand	
<i>Acacia</i> -manuka	P06/089		Whakarungangana Gumfield		Mang. sand	
Cabbage tree-manuka forest	P05/024	Pt SL	Pukewharariki Forest		Mang. sand	Yes
	P05/027		Monument Bush		Mang. sand; alluvium in east	Yes
	P05/032	Pt QEII?	Titihuatahu		Mang. mud; alluvium NW	Yes
Mamaku-totara shrubland	P05/037		Ngawha Bush	young Kerikeri basalt flow		Yes
Mamaku-hangehange shrubland	P05/044		Pouerua Cone	crater of volcanic cone		Yes
Mahoe-boxthorn-gorse- <i>Muehlenbeckia</i> shrubland	P05/050		Kahutoto Stream remnants	Kerikeri basalt flow		
Bracken-manuka shrubland	P05/066		Waikaramu Rd Bush	basalt escarp; valley talus	Mang. mud	Yes
<b>GUMLAND</b>						
Manuka shrubland	P05/001	Pt SL, SR	Aratoro Stream Bush		Akarana supergroup calc. mudstone & sand Porotekoitiamo Stm; Mang. sand/mud N & S Aratoro Stm	Yes
	P05/033	ScR, SL	Ngawha			Yes
Manuka- <i>Gleichenia</i> shrubland	P05/031		Rakautao Bush		Mang. mud	Yes
<i>Gleichenia</i> fernland	P05/033	ScR, SL, Pt QEII	Ngawha Geothermal Field		mudstone	Yes
<i>Baumea-Schoenus</i> -manuka	P05/033	ScR, SL	Ngawha Geothermal Field		mudstone	Yes
<i>Gleichenia-Schoenus-Baumea</i>	P06/089		Whakarungangana Gumfield		Mang. sand	Yes
Manuka- <i>Baumea-Gleichenia</i> shrubland	P06/089		Whakarungangana Gumfield		Mang. sand	Yes
	P05/032	Pt QEII	Titihuatahu		Mang. mud; alluv. NW	Yes
<i>Baumea complanata</i> sedgeland	P05/033	ScR, SL	Ngawha Geothermal Field		mudstone	Yes

VEGETATION	SITE NO.	STATUS	SITE NAME	VOLCANIC	SEDIMENTARY	REP. SITE	
<b>BROADLEAF FOREST</b> Manuka/kanuka-towai forest	O05/079		Otautu Stream Headwaters		Mang. sand	Yes	
	O05/080		Wairere Stream Forest Mosaic	Kerikeri basalt; talus Kerikeri basalt (NW)	Mang. mud Okakari Stm	Yes	
	P05/073		Hui te Werawera Stream Bush		Mang. sand & mud under basalt talus (valleys)		
	P05/022-2		Harrison Rd Bush		Mang. sand		
Kanuka-towai forest	P05/001	Pt SL, SR	Aratoro Stream Bush	Kerikeri basalt & talus on escarpments & slopes N of Aratoro Stm	Akarana supergroup calc. mudstone & sand Porotekoitiamo Stm; Mang. sand/mud N & S Aratoro Stm	Yes	
Towai-kanukarewarewa forest	P05/002		Scotts Road Bush	Kerikeri basalt lava plateau & talus	Mang. sand & mud	Yes	
Kanuka-tairare forest	O05/080 O05/085		Wairere Stream Forest Mosaic Motukiore Bush Association	Kerikeri basalt; talus	Mang. mud Okakari Stm Mang. sand	Yes Yes	
Tairare forest	P05/005		Whakanekeneke River Bush	Kerikeri basalt plateau & talus	Te Kuiti bioclastic sand; limestone bluffs; Mang. sand/mud alluvium Mang. sand	Yes	
	P05/024	Pt SL	Pukewharariki Forest				
	P05/025	Pt SL	Guthrie's Block				
	P05/026	Pt SL	Mangatoa Stream Bush	Kerikeri basalt flow (W)	Mang. sand; alluvium Mang. sand	Yes	
	P05/027		Monument Bush				
	P05/038		Remuera Settlement Rd Remnants	flanks/within andesitic basalt volcano	Mang. mud (W)	Yes	
	P05/047		Ngawhitu Bush				
	P06/007		Tauanui Volcanic Lake & Environs	Taheke basalt & Tangihua	Motatau glau. sand & Mang. mud	Yes	
P05/022-2		Harrison Rd Bush		Mang. sand	Yes		
Karaka-tairare forest	P05/011		Mihi Rd Bush		Te Kuiti Group; Akarana Group calc. mud & sand (N); Mang. sand (S)	Yes	
Tairare-puriri forest (12 sites)	O05/079		Otautu Stream Headwaters	Kerikeri basalt escarpment Kerikeri basaltic plateau remnants (E) Kerikeri basalt plateau; basalt talus Taheke basalt lava flow	Mang. sand Te Kuiti calc. mud & bioclastic sandy limestone bluffs Mang. sand	Yes Yes	
	P05/007	QEII	Waikaraka Stream Bush				
	P05/016		Cooks Rd Bush No. B		Mang. mud & sand	Mang. mud (W)	
	P05/023		Waihoanga Bush				
	P05/068	Pt HR, QEII	Waikuku Rd Bush				
	P05/071		Wehirua Rd Bush			Mang. mud	
P06/008		Tauanui Volcanic Broadleaf Remnants		overlain by Mang. sand & mud	Yes		

VEGETATION	SITE NO.	STATUS	SITE NAME	VOLCANIC	SEDIMENTARY	REP. SITE
	P05/001	Pt SR, SL	Aratoro Stream Bush	Kerikeri basalt & talus N of Aratoro Stm		Yes
	P05/036		Kopenui Stream remnants	young Kerikeri basalt flow		Yes
	P05/037		Ngawha Bush	young Kerikeri basalt flow		Yes
	P05/041		Waitaheke Rd Bush	young Kerikeri basalt flow		Yes
	P05/044		Pouerua Cone	crater of volcanic cone		Yes
Taraire-puriri-towai forest	P05/003		Otamarangi Stream Bush		Te Kuiti glauconitic sand; Mang. sand/mud	Yes
Towai forest (10 sites)	O05/088		Mochau Wetland and Forest Remnant		Mang. sand	
	P05/027		Monument Bush		Mang. sand; alluvium (E)	
	P05/001	Pt SR; SL	Aratoro Stream Bush	Kerikeri basalt & talus on escarpments & slopes N of Aratoro Stm	Akarana supergroup calc. mudstone & sand Porotekoitiamo Stm; Mang. sand/mud N & S of Aratoro Stm	Yes
	P05/026	SL	Mangatoa Stream Bush	Kerikeri basalt flow (W)	Mang. sand; alluvium	Yes
	P05/027		Monument Bush		Mang. sand	Yes
	P05/028		Waihoanga Road Bush	basalt talus SE valley	Mang. sand	Yes
	P05/068	Pt HR, QEII	Waikuku Rd Bush	Kerikeri basaltic plateau remnants (E)	Mang. mud (W)	
	P05/071		Wehirua Rd Bush	Kerikeri basalt plateau; basalt talus	Mang. mud	
	P05/073		Hui te Werawera Stream Bush	Kerikeri basalt (NW)	Mang. sand & mud under basalt talus (valleys)	Yes
	P05/038		Remuera Settlement Rd Remnants	andesitic basalt volcano		Yes
	P05/041		Waitaheke Rd Bush	young Kerikeri basalt flow		
Towai-taraire forest (10 sites)	O05/077		Omao Bush	Kerikeri basalt; talus	Mang. sand; lower slopes	
	O05/080		Wairere Stream Forest Mosaic	Kerikeri basalt; talus	Mang. mud Okakari Stm	Yes
	P05/002		Scotts Road Bush	Kerikeri basalt lava plateau & talus	Mang. sand & mud	
	P05/007		Waikaraka Stream Bush		Te Kuiti calc. mud. & bioclastic sandy limestone bluffs; Akarana supergroup calc. mud & sand	Yes
	P05/014		Te Toke Stream Shrubland	Kerikeri basalt plateau (E) & talus	Mang. mud	
	P05/017		Cooks Airstrip Block	Kerikeri basalt talus	Mang. mud	
	P05/024	Pt SL	Pukewharariki Forest		Mang. sand	
	P05/029	P SR	Reservoir Bush	Kerikeri basaltic eroded volcano		
	P05/032	Pt QEII	Titihuatahu		Mang. mud; alluv. NW	
	P06/007		Tauanui Volcanic Lake & Environs	Taheke basalt & Tangihua		Yes
Towai-tawa forest	P05/002		Scotts Road Bush	Kerikeri basalt lava plateau & talus	Mang. sand & mud	Yes

VEGETATION	SITE NO.	STATUS	SITE NAME	VOLCANIC	SEDIMENTARY	REP. SITE
Towai-rewarewa forest	P05/024	Pt SL	Pukewharariki Forest		Mang. sand	Yes
Puriri forest	P05/038		Remuera Settlement Rd Remnants	andesitic basalt volcano		Yes
	P05/067	Pt QEII	Waimate Broadleaf Remnants	Kerikeri basalt flow & eruptive centre remn.		Yes
	P05/068	Pt HR; QEII	Waikuku Rd Bush	Kerikeri basaltic plateau remnants (E)	Mang. mud (W)	Yes
	P05/069		Bullman Rd Broadleaf Remn.	Kerikeri basalt		Yes
Puriri-karaka-kowhai forest	O05/076		Horeke Road East Bush		Tang./Mang.	Yes
Puriri-kowhai forest	P05/008		Waihoanga Stream Forest Outlier		Te Kuiti glauconitic sand; Waipapa horst Mang. sand/mud	Yes
Kanuka-kowhai forest	O05/078		Rurunga Stream Forest		alluvium	Yes
Puriri-titoki-taraire forest	P05/042		Taumataraire Stream Bush	Kerikeri basalt flow	Mang. mud (Waiaruhe); Motatau glau. sand (Taumataraire)	Yes
Puriri-titoki forest	P05/045		Pouerua Bush	Kerikeri basalt flow; no soil		Yes
Titoki-taraire-mahoe forest	P05/050		Kahutoto Stream remnants	Kerikeri basalt flow		Yes
Titoki-karaka-mahoe forest	P05/050		Kahutoto Stream remnants	Kerikeri basalt flow		Yes
<b>BROADLEAF-PODOCARP FOREST</b>						
Manuka/kanuka-totara forest	O05/079		Otautu Stream Headwaters		Mang. sand	Yes
	O05/078		Rurunga Stream Forest		Mang. sand	
	P05/073		Hui te Werawera Stream Bush	Kerikeri basalt (NW)	Mang. sand & mud under basalt talus (valleys)	
	P06/086		Mangatoa/Punakitere Riverine		Mang. sil. mud & alluvium	
Totara-manuka forest	P05/024	Pt SL	Pukewharariki Forest		Mang. sand	
	P05/101		Utakura River Bush	Kerikeri basalt flow remnant & talus	Mang. sil. mud lower slopes	
Totara-kanuka forest	P05/070		Lake Omapere Swamp Forest Remnant	basalt flows & alluvium		Yes Yes Yes
	P05/017		Cooks Airstrip Block	Kerikeri basalt talus	Mang. mud	
	O06/005		Taheke River Wetlands	Taheke basalt alluvium		
	P06/018		Kaipeha Swamp		Mang. sed.	

VEGETATION	SITE NO.	STATUS	SITE NAME	VOLCANIC	SEDIMENTARY	REP. SITE
Manuka-kanuka-towai-totara forest	P05/017		Cooks Airstrip Block	Kerikeri basalt talus	Mang. mud	
Manuka/kanuka-tanekaha forest	O05/080 O05/083		Wairere Stream Forest Mosaic Pukewhao Forest Mosaic	Kerikeri basalt; talus Kerikeri basalt - trig	Mang. mud Okakari Stm Mang. mud.	Yes Yes
Manuka-totara-tanekaha forest	P05/001	Pt SR; SL	Aratoro Stream Bush	Kerikeri basalt & talus on escarpments & slopes N of Aratoro Stm	Akarana supergroup calc. mudstone & sand Porotekoitiamo Stm; Mang. sand/mud N & S of Aratoro Stm	Yes
Manuka-totara-tanekaha shrubland	P05/014 O05/076		Te Toke Stream Shrubland Horeke Road East Bush	Kerikeri basalt plateau (E) & talus	Mang. mud Mang. sand & mud	Yes Yes
Totara-tanekaha-manuka	P05/026	Pt SL	Mangatoa Stream Bush	Kerikeri basalt flow (W)	Mang sand; alluvium	
Kanuka-totara-tanekaha forest	O05/084 O05/085		Carrs/Waimahe Stream Bush Motukiore Bush Association		Mang. sand Mang. sand	
Kanuka-tanekaha-towai forest	O05/082		Whitecliffs Ltd Bush	Kerikeri basalt upper slopes	Mang. sand & talus downslope	Yes
Kanuka-totara-taraire forest	O05/084		Carrs/Waimahe Stream Bush		Mang. sand	Yes
Kahikatea-totara-manuka forest	O05/077 P05/013		Omao Bush Forest Rd Bush	Kerikeri basalt; talus	Mang. sand; lower slopes Akarana Supergroup sand & mud (N); Mang. mud (S)	Yes
Kanuka-totara-kahikatea forest	P05/021		Utakura Bush		Mang. sand & mud	Yes
Totara-kahikatea-kanuka	P05/012 P06/018		Okoro Stream Bush Kaipeha Swamp	Kerikeri basalt (upper) ponded by Taheke basalt lava flow	Mang. sand downslope Mang. sed.	Yes
Kanuka-kahikatea forest	P06/018		Kaipeha Swamp	ponded by Taheke basalt lava flow	Mang. sed.	Yes
Taraire-totara-kanuka forest	P05/031		Rakautao Bush		Mang. mud	Yes
Taraire-totara forest	P05/008 O05/076		Waihoanga Stream Forest Outlier Horeke Road East Bush		Te Kuiti glauconitic sand; Waipapa horst; Mang. sand/mud Tang./Mang.	



VEGETATION	SITE NO.	STATUS	SITE NAME	VOLCANIC	SEDIMENTARY	REP. SITE
Taraire-totara forest (continued)	P05/014		Te Toke Stream Shrubland	Kerikeri basalt plateau (E) & talus Kerikeri basalt plateau & talus (W)	Mang. mud	
	P05/015		Cooks TV Block		Mang. mud (E)	Yes
	P06/019		Punakitere/Ninihi Rd Bush		Mang. sand	Yes
Taraire-totara-kanuka forest	P05/031		Rakautao Bush		Mang. mud	
Kahikatea-taraire forest	O05/076		Horeke Road East Bush		Tang./Mang.	
Nikau-kahikatea-taraire forest	O05/076		Horeke Road East Bush		Tang./Mang.	Yes
Taraire-puriri-kahikatea forest	P05/010		Donaldsons Road Bush		Mang. sand & mud; Akarana Group calc. mud & sand	Yes
Taraire-totara-kahikatea forest	O05/085		Motukiore Bush Association	Kerikeri basalt lava plateau & talus	Mang. sand	Yes
	P05/002		Scotts Road Bush		Mang. sand & mud	Yes
Totara-taraire-puriri forest	O05/082		Whitecliffs Ltd Bush	Kerikeri basalt upper slopes Kerikeri basalt (upper) Kerikeri basalt flow & talus basalt escarpment; valley talus Kerikeri basalt flow remnant & talus	Mang. sand & talus downslope	
	P05/012		Okoro Stream Bush		Mang. sand downslope	
	P05/018		Puriri Farm Bush			Yes
	P05/066	Pt QEII	Waikaramu Rd Bush		Mang. mud	Yes
	P05/101-2		Utakura River Bush		Mang. sil. mud lower slopes	
Totara-puriri forest	P05/071		Wehirua Rd Bush	Kerikeri basalt plateau & talus	Mang. mud	
Puriri-totara-kahikatea forest	O05/076		Horeke Road East Bush	young Kerikeri basalt flow Kerikeri basalt flow	Tang./Mang.	Yes
	P05/041		Waitaheke Rd Bush			
	P05/076-2		Okokako Rd Remnant			
Towai-totara forest	P05/002		Scotts Road Bush	Kerikeri basalt lava plateau & talus Kerikeri basalt	Mang. sand & mud	Yes
	P05/006		Lake Omapere and Environs		Mang. sand; alluvium	
Totara-manuka-towai forest	P05/014		Te Toke Stream Shrubland	Kerikeri basalt plateau (E) & talus	Mang. mud	
Totara-towai-kanuka forest	P05/031		Rakautao Bush		Mang. mud	Yes

VEGETATION	SITE NO.	STATUS	SITE NAME	VOLCANIC	SEDIMENTARY	REP. SITE
Towai-totara-rewarewa forest	P05/031		Rakautao Bush		Mang. mud	Yes
Totara-kahikatea-towai forest	P05/002		Scotts Road Bush	Kerikeri basalt lava plateau & talus	Mang. sand & mud	Yes
	P05/029	Pt SR	Reservoir Bush	Kerikeri basaltic eroded volcano		
Totara-towai-tarairae forest	P05/073		Hui te Werawera Stream Bush	Kerikeri basalt (NW)	Mang. sand & mud under basalt talus (valleys)	Yes
Towai-tanekaha	O05/080	Pt SL	Wairere Stream Forest Mosaic	Kerikeri basalt; talus Kerikeri basalt - trig	Mang. mud Okakari Stm	Yes Yes Yes
	O05/083		Pukewhao Forest Mosaic		Mang. mud	
	P05/025		Guthrie's Block		Mang. sand & Ngatuturi mudstone (NE)	
<b>PODOCARP FOREST</b>						
Totara forest (secondary)	P05/030	Pt QEII	How Rd Bush	Kerikeri basalt flow young Kerikeri basalt andes. basalt volcano	Mang. mud (Waiaruhe); Motatau glau. sand (Taumatatarairae) Mang. mud Mang. mud (W) Mang. mud Mang. mud valley & alluvium Mang. sil. mud & alluvium Mang. sand	Yes
	P05/036		Kopenui Stream Remnants			
	P05/038		Remuera Settlement Rd Remnants			
	P05/042		Taumatatarairae Stream Bush	Kerikeri basalt flow		
	P05/066		Waikaramu Rd Bush	basalt escarpment; valley talus		
	P05/068		Waikuku Rd Bush	Kerikeri basaltic plateau remnants		
	P05/069		Bullman Rd Broadleaf Remnants	Kerikeri basalt		
	P05/071		Wehirua Rd Bush	Kerikeri basalt plateau & talus		
	P05/075		Atkins/Ohaio Bush	Kerikeri basalt & talus in north		
	P06/086		Mangatoa/Punakitere Riverine			
	P05/022-2		Harrison Rd Bush			
	P05/002		Scotts Road Bush	Kerikeri basalt lava plateau & talus		
P05/072-2	Scott Rd Remnants	Kerikeri basalt remnant plateau				
Kahikatea forest	O05/084	Pt SL	Carrs/Waimahe Stream Bush	alluvium ponded by basalt flow	alluvium	Yes Yes Yes Yes
	P05/006		Lake Omapere and Environs		alluvium	
	P05/024		Pukewharariki Forest		alluvium	
	P05/027		Monument Bush		Mang. sand; alluv. (E)	
	P05/043	Waiaruhe Bush Remnants				
	P06/010	Punakitere Valley Swamp Forest	Taheke basalt lava flow	alluvium underlain Mang. sand & mud alluvium		
	P05/039	South Omapere Kahikatea Remn.		Tang./Mang.		
	O05/076	Horeke Road East Bush		Mang. sand		
P05/025	Guthrie's Block		Akarana supergroup calc. mud & sand			
P05/007	Waikaraka Stream Bush					

VEGETATION	SITE NO.	STATUS	SITE NAME	VOLCANIC	SEDIMENTARY	REP. SITE
Kahikatea forest (continued)	P05/008		Waihoanga Stream Forest Outlier		Te Kuiti glauconitic sand; Waipapa horst; Mang. sand/mud	Yes
	P05/013		Forest Rd Bush		Akarana Supergroup sand & mud (N)	
	P05/023		Waihoanga Bush		Mang. mud (S)	
	P05/047		Ngawhitu Bush		Mang. mud & sand - toeslope	
	P05/002		Scotts Road Bush	Kerikeri basalt lava plateau & talus	Motatau glau. sand & Mang. mud	Yes
	P05/018		Puriri Farm Bush	Kerikeri basalt flow & talus Waiharakeke	Mang. sand	Yes
	P05/075		Atkins/Ohaio Bush	Kerikeri basalt & talus in north	Mang. mud valley & alluvium	Yes
	P05/101-2		Utakura River Bush	Kerikeri basalt & talus	Mang. sil mud lower slopes	
	P05/042		Taumatataraire Stream Bush	Kerikeri basalt flow	Mang. mud (Waiaruhe); Motatau glau. sand (Taumatataraire)	Yes
	P05/035		Youngs Kahikatea Remnant	Kerikeri basalt flow		Yes
	P05/038		Remuera Settlement Rd Remnants	andesitic basalt volcano		Yes
	P05/041		Waitaheke Rd Bush	young Kerikeri basalt flow		
	P05/050		Kahutoto Stream remnants	Kerikeri basalt flow		Yes
	P06/007		Tauanui Volcanic Lake & Environs	Taheke basalt & Tangihua		Yes
P05/076-2		Okokako Rd Remnant	Kerikeri basalt flow/ eruptive remnant			
Kahikatea-totara forest	P05/003		Otamarangi Stream Bush		Te Kuiti glauc. sand; Mang. sand/mud	
	P05/005		Whakanekeneke River Bush	Kerikeri basalt plateau & talus	Te Kuiti bioclastic sand; limestone bluffs; Mang. sand & mud; alluvium	Yes
	P05/010		Donaldsons Road Bush		Mang. sand & mud; Akarana Group calc. mud & sand	
	P05/011		Mihi Rd Bush		Mang. sand (S)	Yes
	P05/014		Te Toke Stream Shrubland		alluvium	Yes
	P05/016		Cooks Rd Bush No. B		Mang. sand	
	P05/017		Cooks Airstrip Block	Kerikeri basalt talus	Mang. mud	
	P05/030		How Rd Bush	Kerikeri basalt flow		
	P05/047		Ngawhitu Bush		Motatau glau. sand & Mang. mud	Yes
	P05/068	? Pt HR; QEII	Waikuku Rd Bush	Kerikeri basaltic plateau remnants	Mang. mud (W)	
	P05/073		Hui te Werawera Stream Bush	Kerikeri basalt (NW)	Mang. sand & mud under basalt talus	Yes
	P05/074		D Cooks Bush	Kerikeri basalt flow (NW)	Mang. mud	Yes
	P06/019		Punakitere/Ninihi Rd Bush		Mang. sand	

VEGETATION	SITE NO.	STATUS	SITE NAME	VOLCANIC	SEDIMENTARY	REP. SITE
Kahikatea-totara forest (continued)	P05/009-2 P05/065-2		Lamberg Rd Bush Ngaungau Pa Bush	Kerikeri volcanics	Mang. mud Mang. mud	
Kahikatea-tanekaha-totara forest	P05/015		Cooks TV Block	Kerikeri basalt plateau & talus (W)	Mang. mud (E)	Yes
Rimu-totara-miro-kahikatea forest	P05/024	Pt SL	Pukewharariki Forest		Mang. sand	Yes
Totara-rimu forest	P05/066	Pt QEII?	Waikaramu Rd Bush	basalt escarpment; valley talus	Mang. mud	Yes
Tanekaha shrubland	P05/017		Cooks Airstrip Block	Kerikeri basalt & talus	Mang. mud.	Yes
<b>KAURI</b> Taraire-totara-kauri-tanekaha forest	O05/084		Carrs/Waimahe Stream Bush		Mang. sand	Yes
Kauri forest	P05/014		Te Toke Stream Shrubland	Kerikeri basalt plateau (E) & talus	Mang. mud	Yes
Kauri-towai forest	P05/032	Pt QEII?	Titihuatahu		Mang mud; alluv. (NW)	Yes
Manuka/kanuka-towai-kauri forest	O05/081		Whitecliffs		Mang. sand	Yes
Kauri-tanekaha forest	O05/088		Moehau Wetland and Forest Remnant		Mang. sand; estuarine	Yes
Kauri-rimu forest	P05/002		Scotts Road Bush	Kerikeri basalt lava plateau & talus		Yes
Kauri-kawaka forest	P05/024		Pukewharariki Forest		Mang. sand	Yes
<b>WETLANDS</b> Open water	P05/006 P05/046  P06/007 P06/080 P06/088 P05/004-2		Lake Omapere and Environs Lake Owhareiti  Tauanui Volcanic Lake & Environs Korowhata Stream Pond Tautoro Wetland Waiare Rd Pond	Kerikeri basalt Lakes ponded by Kerikeri basalt flows  Taheke basalt & Tangihua  remnant basalt plateau	Mang.sand; alluvium Motatau Complex glau. sand (Jacks); Mang. mud (Owhareiti)  alluvium Mang. mud	Yes Yes  Yes Yes
Raupo reedland	O05/078 O05/086 O06/005 P05/024 P05/034 P05/041		Rurunga Stream Forest Maraeroa Swamps Taheke River Wetlands Pukewharariki Forest Ngawha Swamps Waitaheke Rd Bush	Taheke basalt flow  Kerikeri basalt flow young Kerikeri basalt flow	Mang. sand alluvium/estuarine  Mang. sand alluvium	Yes Yes Yes Yes

VEGETATION	SITE NO.	STATUS	SITE NAME	VOLCANIC	SEDIMENTARY	REP. SITE
Raupo reedland (continued)	P05/046		Lake Owhareiti	Lakes ponded by Kerikeri basalt flows	Motatau Complex glau. sand (Jacks); Mang. mud (Owhareiti)	Yes
	P05/050		Kahutoto Stream remnants	Kerikeri basalt flow	alluvium	Yes
	P05/064		Puketotara/Patukauwae/ Te Keene Stream Swamp			
	P05/066		Waikaramu Rd Bush	basalt escarpment; valley talus	Mang. mud	
	P06/018		Kaipeha Swamp	ponded by Taheke basalt lava flow	Mang. sed.	Yes
P06/019		Punakitere/Ninihi Rd Bush		alluvium		
P06/080		Korowhata Stream Pond		alluvium		
Raupo- <i>Calystegia</i> sp. association	O05/085		Motukiore Bush Association		Mang. sand	
Raupo- <i>Carex</i> association	P05/019		Okaka Rd Wetland		Holocene alluvium	Yes
Raupo- <i>Baumea</i> association	P05/020		Horeke Rd Swamp		Holocene alluvium	Yes
	P05/031		Rakautao Bush		Mang. mud	Yes
<i>Baumea</i> sedgeland	P06/018		Kaipeha Swamp	ponded by Taheke basalt lava flow	Mang. sed.	Yes
<i>Baumea-Schoenus</i> -manuka bog assoc.	P05/033	Pt QEII	Ngawha Geothermal Field		mudstone	Yes
Toetoe-raupo	P05/040		Waingaruru Stream Swamp	young Kerikeri basalt flow		Yes
Cabbage tree-raupo	P05/040		Waingaruru Stream Swamp	young Kerikeri basalt flow		Yes
Flax-raupo	P05/040		Waingaruru Stream Swamp	young Kerikeri basalt flow		Yes
Flax	P05/039		South Omapere Kahikatea Remnant		Mang. sand	Yes
Manuka-flax	P06/018		Kaipeha Swamp	ponded by Taheke basalt lava flow	Mang. sed.	Yes
<i>Juncus</i> rushland	P05/006		Lake Omapere and Environs	Kerikeri basalt	Mang. sand; alluvium	Yes
<i>Eleocharis</i> sedgeland	P05/046		Lake Owhareiti	Lakes ponded by Kerikeri basalt flows	Motatau Complex glau. sand (Jacks); Mang. mud (Owhareiti)	Yes
	P06/088		Tautoro Wetland		Mang. mud	
	P05/004		Waiare Rd Pond	remnant basalt plateau		

VEGETATION	SITE NO.	STATUS	SITE NAME	VOLCANIC	SEDIMENTARY	REP. SITE
<i>Apodasmia</i> sedgeland	O05/086		Maraeroa Swamps		alluvium/estuarine	Yes
<i>Carex</i> sedgeland	P06/088		Tautoro Wetland		Mang. mud	Yes
Willow- <i>Carex</i> assoc.	P05/050		Kahutoto Stream remnants	Kerikeri basalt flow		
Crack willow treeland	P05/064		Puketotara/Patukauwae/ Te Keene Stream Swamp		alluvium	
<b>SWAMP SHRUBLAND &amp; FOREST</b>						
Manuka swamp shrubland	P05/006		Lake Omapere and Environs	Kerikeri basalt	Mang. sand; alluvium	Yes but destroyed 1997
Manuka- <i>Baumea</i>	P06/018		Kaipeha Swamp	ponded by Taheke basalt lava flow	Mang. sed.	Yes
Manuka-cabbage tree- <i>Carex</i> assoc.	P05/019		Okaka Rd Wetland		Holocene alluvium	Yes
Manuka- <i>Coprosma propinqua</i> swamp shrubland	P05/064		Puketotara/Patukauwae/ Te Keene Stream Swamp		alluvium	Yes
Kohuhu-manuka-putaputaweta shrubland	P06/010		Punakitere Valley Swamp Forest		alluvium	Yes
<i>C. propinqua-C. rigida-Bolboschoenus</i> swamp shrubland	O05/088		Moehau Wetland and Forest Remnant		Mang. sand; estuarine	Yes
Kowhai- <i>C. propinqua-Gabnia</i> swamp forest	O05/088		Moehau Wetland and Forest Remnant		Mang. sand; estuarine	Yes
Kahikatea swamp forest	P05/064		Puketotara/Patukauwae/ Te Keene Stream Swamp		alluvium	Yes
Kahikatea-pukatea swamp forest	P05/070 P05/040		Lake Omapere Swamp Forest Remnant Waingaruru Stream Swamp	basalt flows young Kerikeri basalt flow	alluvium	Yes Yes
Kahikatea-cabbage tree swamp forest	P06/018		Kaipeha Swamp	ponded by Taheke basalt lava flow	Mang. sed.	Yes
Kahikatea-cabbage tree-swamp maire swamp forest	P05/034 P05/035		Ngawha Swamps Youngs Kahikatea Remnant	Kerikeri basalt flow Kerikeri basalt flow	alluvium	Yes Yes
Kahikatea-kanuka forest	O05/086		Maraeroa Swamps		alluvium/estuarine	Yes

TABLE 3. SUMMARY OF SITE EVALUATIONS (e.u.s = ecological units; regen. = regenerating).

SITE	SITE NO.	REPRESENTATIVENESS	RARITY/SPECIAL FEATURES	
<b><i>Level 1 sites</i></b>				
Horeke Road East Bush	O05/076	Rep. site for 4 e.u.s	Kiwi likely	
Omao Bush	O05/077		Species assemblage of bot. interest	
Rurunga Stream Forest	O05/078	Rep. site for 2 e.u.s	Wetland & alluvial forest; fernbird	
Otautu Stream Headwaters	O05/079	Rep. site for 2 e.u.s	Kukupa; emergents	
Wairere Stream Forest Mosaic	O05/080	Rep. site for 6 e.us	Kiwi, kukupa	
Whitecliffs	O05/081	Rep. site	Kiwi likely	
Whitecliffs Ltd Bush	O05/082	Rep. site for 1 e.u.	Kukupa, kiwi	
Pukewhao Forest Mosaic	O05/083	Rep. site for 2 e.u.s	Some coastal riparian values	
Carrs/ Waimahe Stream Bush	O05/084	Rep. site for 3 e.u.s	Kiwi, kauri snail	
Motukiore Bush Association	O05/085	Rep. site for 3 e.u.s	Kiwi, kukupa, spotless crane	
Maraeroa Swamps	O05/086	Rep. site for 3 e.u.s	Spotless crane; wetland & alluvial forest	
Moehau Wetland and Forest Mosaic	O05/088	Rep. site for 3 e.u.s	Rare swamp forest and shrubland	
Taheke River Wetlands	O06/005	Rep. site for 1 e.u.	Wetland	
Aratoro Stream Bush	P05/001	Rep. site for all 5 e.u.s	Kiwi, kukupa, fernbird, pied tit; 1 threatened plant sp.; national soil site; gumland	
Scotts Road Bush	P05/002	Rep. site for 5 e.u.s	Kiwi, kukupa	
Otamarangi Stream Bush	P05/003	Rep. site for 1 e.u.	Kukupa	
Whakanekeneke River Bush	P05/005	Rep. site for 2 e.u.s	Kiwi, kukupa	
Lake Omapere and Environs	P05/006	Largest lake in region; rep. site for 2 e.u.s	<i>Isoetes</i> aff. <i>kirkii</i> , bittern, fernbird	
Waikaraka Stream Bush	P05/007	Rep. site for 4 e.u.s	Kukupa	
Waihoanga Stream Forest Outlier	P05/008	Rep. site for 2 e.u.s		
Donaldsons Road Bush	P05/010	Rep site for 1 e.u.		

	DIVERSITY & PATTERN	NATURALNESS	BUFFER/LINKAGE/CORRIDOR	SIZE & SHAPE
	7 e.u.s		Some riparian protection	c. 300 ha
		Regen.	Partial linkage	c. 50 ha
				46 ha
		40% regen.	Refuge	>160 ha
	6 e.u.s; kawaka, whau, n. rata emergent	70% regen.	Linked by pines to 2 other sites; refuge	>300 ha
	1 e.u.		Refuge; 2 areas linked by pines	70 ha
	2 e.u.s; some n. rata emergent		Linked by pines to 2 other sites; refuge	c. 50 ha
	3 e.u.s	Regen.	Close to O05/080; catchment protection	c. 240 ha
	emergent element	>50% regen.		c. 130 ha
	7 e.u.s including wetland	Linked by scrub	Some catchment protection	c. 400 ha
	3 e.u.s	2 sites; no weeds or grazing		6.5 ha
	5 e.u.s; grades from CMA to 155 m asl	Some drains & stop-banks; weeds		120 ha
	3 e.u.s	2 sites 1 km apart	adjacent CMA	9.5 ha
	diversity of rock types; > 10 sp. orchid	Intact		c. 670 ha
	9 e.u.s; river regionally significant		Catchment protection; partial linkage	200 ha
	3 e.u.s		Catchment protection; partial linkage	30 ha
	4 e.u.s; diversity of rock types	10 sites	Some riparian buffering	140 ha
	5 e.u.s			>1200 ha
	4 e.u.s		Partial linkage	c. 50 ha
	3 e.u.s	Heavily grazed	Partial linkage	c. 45 ha
	2 e.u.s	Several sites	Partial linkage	c. 70 ha



SITE	SITE NO.	REPRESENTATIVENESS	RARITY/SPECIAL FEATURES	
Mihi Road Bush	P05/011	Rep. site for 2 e.u.s	Kiwi, kukupa	
Okoro Stream Bush	P05/012		Kiwi, kukupa	
Forest Road Bush	P05/013	Rep. site for 2 e.u.s	Contiguous with Puketi	
Te Toke Stream Shrubland	P05/014	Rep. site for 5 e.u.s	Possibly kiwi	
Cooks TV Block	P05/015	Rep. site for 2 e.u.s	Kiwi likely	
Cooks Road Bush No. B	P05/016		Kiwi, kukupa	
Cooks Airstrip Block	P05/017	Rep. site for 2 e.u.s	Kiwi, kukupa, kauri snail	
Puriri Farm Bush	P05/018	Rep. site for 1 e.u.	Kukupa	
Okaka Road Wetland	P05/019	Rep. site for 2 e.u.s	Rare wetland types	
Horeke Road Swamp	P05/020	Rep. site for 1 e.u.	Wetland	
Utakura Bush	P05/021	Rep. site for 1 e.u.		
Waihoanga Bush	P05/023		Kiwi, kukupa, kauri snail	
Pukewharariki Forest	P05/024	Rep. site for 3 e.u.s largest forest in ED;	Kiwi, kukupa, pied tit, kauri snail; national soil site	
Guthries Block	P05/025	Rep. site for 2 e.u.s	Kiwi	
Mangatoa Stream Bush	P05/026		Possibly kiwi	
Monument Bush	P05/027	Rep. site for 4 e.u.s		
Waihoanga Road Bush	P05/028	Rep. site for 1 e.u.		
Reservoir Bush	P05/029		Kukupa, kauri snail, possibly kiwi	
How Road Bush	P05/030	Rep. site for 1 e.u.	Kauri snail	
Rakautao Bush	P05/031	Rep. site for 5 e.u.s	Fernbird, kiwi in adjacent site	
Titihuatahu	P05/032	Rep. site for 3 e.u.s	Kiwi, fernbird; 3 threatened plants gumland	
Ngawha Geothermal Field	P05/033	Rep. site for 4 e.u.s	Northland mudfish, fernbird, spotless crane, bittern; gumland 4 threatened plants	
Ngawha Swamps	P05/034	Rep. site for 2 e.u.s	Bittern, spotless crane; <i>Thelypteris confluens</i> record 1984; wetland/swamp forest	

	DIVERSITY & PATTERN	NATURALNESS	BUFFER/LINKAGE/CORRIDOR	SIZE & SHAPE
	2 e.u.s		Partial linkage	160 ha
	2 e.u.s		Partial linkage	c. 70 ha
	2 e.u.s	Secondary forest		27 ha
	7 e.u.s		Some catchment protection; partial linkage	740 ha
	2 e.u.s		Linked to 2 other sites	27 ha
	2 e.u.s	Possum and stock damage	Some riparian protection	25 ha
	6 e.u.s			196 ha
	2 e.u.s		Some riparian values	c. 60 ha
	2 e.u.s			c. 7 ha
	1 e.u.			8 ha
	2 e.u.s	Gorse within shrubland	Partial linkage	c. 175 ha
	3 e.u.s	Possum and stock damage	Riparian values	c. 100 ha
	9 e.u.s; 10 sp. gymnosperm; uncommon plant sp.	Varies - some intact forest	Linked to other areas	c. 3000 ha
	4 e.u.s		Close to P05/024	255 ha
	3 e.u.s			c. 70 ha
	6 e.u.s		Some riparian values	c. 60 ha
	1 e.u.		Some riparian values	c. 30 ha
	2 e.u.s	Some stock and weed damage		>100 ha
	2 e.u.s	4 sites	Some riparian values	30 ha
	6 e.u.s		Refuges within pines	c. 370 ha
	4 e.u.s			c. 1000 ha
	4 e.u.s			181 ha
	2 e.u.s	Some crack willow		24 ha

SITE	SITE NO.	REPRESENTATIVENESS	RARITY/SPECIAL FEATURES PATTERN	
Youngs Kahikatea Remnant	P05/035	Rep. site for 2 e.u.s	Swamp forest and volcanic soils	
Ngawha Bush	P05/037	Rep. site for 2 e.u.s	Volcanic broadleaf forest	
Remuera Settlement Road Remnants	P05/038	Rep. site for 5 e.u.s	Andesitic basalt volcano	
South Omapere Kahikatea Remnant	P05/039	Rep site for 1 e.u.	Last sites adjoining lake	
Waingaruru Stream Swamp	P05/040	Rep. site for 4 e.u.s rare swamp and wetland types	Banded rail, bittern, spotless crane	
Waitaheke Road Bush	P05/041	Rep. site for 1 e.u.	Volcanic soils	
Taumatataraire Stream Bush	P05/042	Rep. site for 2 e.u.s	Uncommon forest type	
Waiaruhe Bush Remnants	P05/043	Rep. site	Secondary podocarp forest	
Pouerua Cone	P05/044	Rep. site for 2 e.u.s	Volcanic crater; endemic snails	
Pouerua Bush	P05/045	Rep. site for 1 e.u. Unique in ED plant sp.; coastal species; kukupa	Rare forest type; 2 threatened	
Lake Owhareiti and Jacks Lake	P05/046	Rep. site for 1 e.u.	Best waterfowl site in ED	
Ngawhitu Bush	P05/047	Rep. site for 3 e.u.s	Kauri snail	
Kahutoto Stream Remnant	P05/050	Rep. site for 3 e.u.s; unique in ED coastal species	Bittern; rare forest types on volcanic flats	
Puketotara/Patukauwae Te Keene Stream Swamp	P05/064	Rep. site for 3 e.u.s	Rare swamp forest and shrubland; 2 <sup>nd</sup> largest in ED; bittern, spotless crane	
Waikaramu Road Bush	P05/066	Rep. site for 3 e.u.s	Kiwi, kukupa; kauri snail	
Waimate Broadleaf Remnants	P05/067	Rep site for 1 e.u.	Puriri forest rare; kukupa	
Waikuku Road Bush	P05/068	Rep. site for 2 e.u.s uncommon plant species	Puriri forest rare; kiwi, kauri snail	
Bullman Road Broadleaf Remnants	P05/069	Rep. site for 1 e.u.	Puriri forest rare	
Lake Omapere Swamp Forest Remnant	P05/070	Rep. site for 1 e.u.	Rare swamp forest	
Wehirua Road Bush	P05/071	Rep. site for 1 e.u.	Kiwi likely	
Hui te Werawera Stream Bush	P05/073	Rep. site for 4 e.u.s	Kiwi, kukupa, kauri snail	

	DIVERSITY &	NATURALNESS	BUFFER/LINKAGE/CORRIDOR SHAPE	SIZE &
	3 e.u.s			12 ha
	2 e.u.s	2 sites		18 ha
	5 e.u.s	Fragmented		56 ha
	2 e.u.s	Fragments		tiny, 3.1 ha
	4 e.u.s	Much reduced		7.5 ha
	5 e.u.s	Stock damage		9 ha
	4 e.u.s	5 sites browsed	Some riparian values	c. 64 ha
	1 e.u.	Stock; logged		c. 30 ha
	2 e.u.s	Stock; gorse margin		> 4 ha
	1 e.u.	Exotics within site but no stock		71 ha
	3 e.u.s	Margins grazed		125 ha
	4 e.u.s	4 sites	Partial linkage	125 ha
	6 e.u.s	<i>Tradescantia</i> ; stock		8 ha
	4 e.u.s	Stock; crack willow, exotics		25 ha
	5 e.u.s mosaic	Gorse; some fenced	Some riparian values	c. 250 ha
	1 e.u.	9 sites		37 ha
	6 e.u.s	Exotic forest a linkage; weeds	Partial linkage; some catchment protection	c. 175 ha
	2 e.u.s	Fragments		c. 19 ha
	2 e.u.s	Degraded fragments		< 4 ha
	4 e.u.s		Partial linkage	65 ha
	6 e.u.s	Gorse	Partial linkage; catchment protection	c. 1000 ha

SITE	SITE NO.	REPRESENTATIVENESS	RARITY/SPECIAL FEATURES	
D Cooks Bush	P05/074	Rep. site for 1 e.u.	Kiwi, kukupa	
Atkins/Ohaio Bush	P05/075	Rep. site for 1 e.u.	Kiwi	
Tauanui Volcanic Lake & Environs	P06/007	rep. site for 3 e.u.s; unique in ED	Kauri snail endemic snails; waterfowl site	
Tauanui Volcanic Broadleaf Remnant	P06/008	Rep. site for 1 e.u.	Volcanic broadleaf forest	
Punakitere Valley Swamp Forest	P06/010	Rep. site for 3 e.u.s	Rare alluvial forest & shrubland	
Kaipaha Swamp	P06/018	Rep. sites for 7 e.u.s	Largest wetland in ED; bittern, spotless crane, fernbird, kiwi, kukupa; kauri snail	
Punakitere/Ninihi Road Bush	P06/019	Rep. site for 1 e.u.	Kauri snail; wetland	
Korowhata Stream Pond	P06/080		NZ dabchick, bittern	
Mangatoa/Punakitere Riverine	P06/086	Rep. site for 1 e.u.	Riverine	
Tautoro Wetland	P06/088	Rep. site for 2 e.u.s	Wetland	
Whakaruangangana Gumfield	P06/089	Rep. site for 2 e.u.s	Gumland	
Karakamatamata Scenic Reserve	P06/091		Kukupa; kiwi possible	
<b><i>Level 2 sites</i></b> Waiare Road Pond	P05/004			
Lamberg Road Bush	P05/009			
Harrison Road Bush	P05/022			
Kopenui Stream Remnants	P05/036		Volcanic broadleaf forest	
Ngaungau Pa Bush	P05/065			
Scott Road Remnants	P05/072			
Okokako Road Remnant	P05/076			
Utakura River Bush	P05/101			

	DIVERSITY & PATTERN	NATURALNESS	BUFFER/LINKAGE/CORRIDOR	SIZE & SHAPE
	2 e.u.s		Partial linkage	c. 63 ha
	2 e.u.s	2 sites	Partial linkage	c. 26 ha
	4 e.u.s	2 aquatic weeds		58 ha
	1 e.u.	7 sites; possum & stock damage		c. 15 ha
	3 e.u.s	Fragmented		c. 140 ha
	8 e.u.s	Largely intact		c. 870 ha
	3 e.u.s		Buffer to Kaipaha	> 50 ha
	2 e.u.s	Constructed pond		c. 7 ha
	3 e.u.s		Buffer to river	c. 135 ha
	3 e.u.s			c. 5 ha
	4 e.u.s	Exotic species		c. 130 ha
	2 e.u.s	Weeds		c. 12 ha
	2 e.u.s	Farm pond		1 ha
	1 e.u.			c. 14 ha
	3 e.u.s			c. 30 ha
	2 e.u.s	2 sites		c. 19 ha
	1 e.u.	Fragmented	Partial linkage	c. 13 ha
	1 e.u.	3 sites	Partial linkage	c. 18 ha
	2 e.u.s	2 sites; stock		c. 8 ha
	4 e.u.s		Partial linkage	c. 50 ha