4.2 LEVEL 2 SITES

The following were assessed to be Level 2 sites. These are listed in Table C, and described and mapped in the ensuing sections.

TABLE C: LIST OF LEVEL 1 SITES.

SITE NAME	SURVEY NO.	GRID REF.
Ngatoka Wetland Catchment	Q07/115	Q07 279901
Pakouhokio Knoll Forest	Q07/122	Q07 359958
Waipu Caves Road Wetland	Q07/123	Q07 364835
Crutcher Road Forest Remnants	Q07/133	Q07 252870
Reid Road Forest Remnants	Q07/134	Q07 280826
Hewlett QEII Covenant	Q07/136	Q07 371909
Mangapai Caves Road Wetland	Q07/140	Q07 285898
Sandford Road Forest Remnants	Q07/142	Q07 401875
Hayward Road Forest Remnant	Q07/146	Q07 223929
Moewhare Forest and Shrubland	Q07/147	Q07 228904
Paparoa Road Dam Forest Remnants	Q07/151	Q07 235900
Ruarangi Road Forest Remnants 3	Q07/153	Q07 259887
Ruarangi Road Wetland	Q07/154	Q07 256931
Ruarangi Mangapai Forest Remnants	Q07/155	Q07 259926
Ruarangi Road Forest Remnants 2	Q07/156	Q07 256901
Graham Road Riparian Forest Remnants	Q07/157	Q07 259910
Graham Road Forest Remnant	Q07/159	Q07 266903
Graham Road Forest and Shrubland	Q07/160	Q07 272909
Mangapai Riparian Forest Remnants	Q07/161	Q07 266936
Mill Brook Forest Remnants	Q07/165	Q07 369808
McLeod Road Forest Remnants	Q07/166	Q07 391841
Takahiwai Saltmarsh and Shrubland	Q07/167	Q07 379958
Northern Brynderwyn Hills Remnants	Q08/227	Q08 384725
Braigh Forest Remnants	Q08/229	Q08 392768
Argyll Street Forest Remnant	Q08/234	Q08 408779
Finlayson's Brook Forest Remnants	Q08/242	Q08 349749
Brooks Road Forest Remnants	Q08/243	Q08 358749
Millbrook Dam and Forest Remnants	Q08/245	Q08 284799
Shoemaker Road Forest Remnant 1	Q08/246	Q08 399796

NGATOKA WETLAND CATCHMENT

Survey no.	Q07/115
Survey date	13 November 2006
Grid reference	Q07 279901 (7 remnants)
Area	8.5 ha (5.7 ha forest, 2.8 ha wetland)
Altitude	100–162 m asl

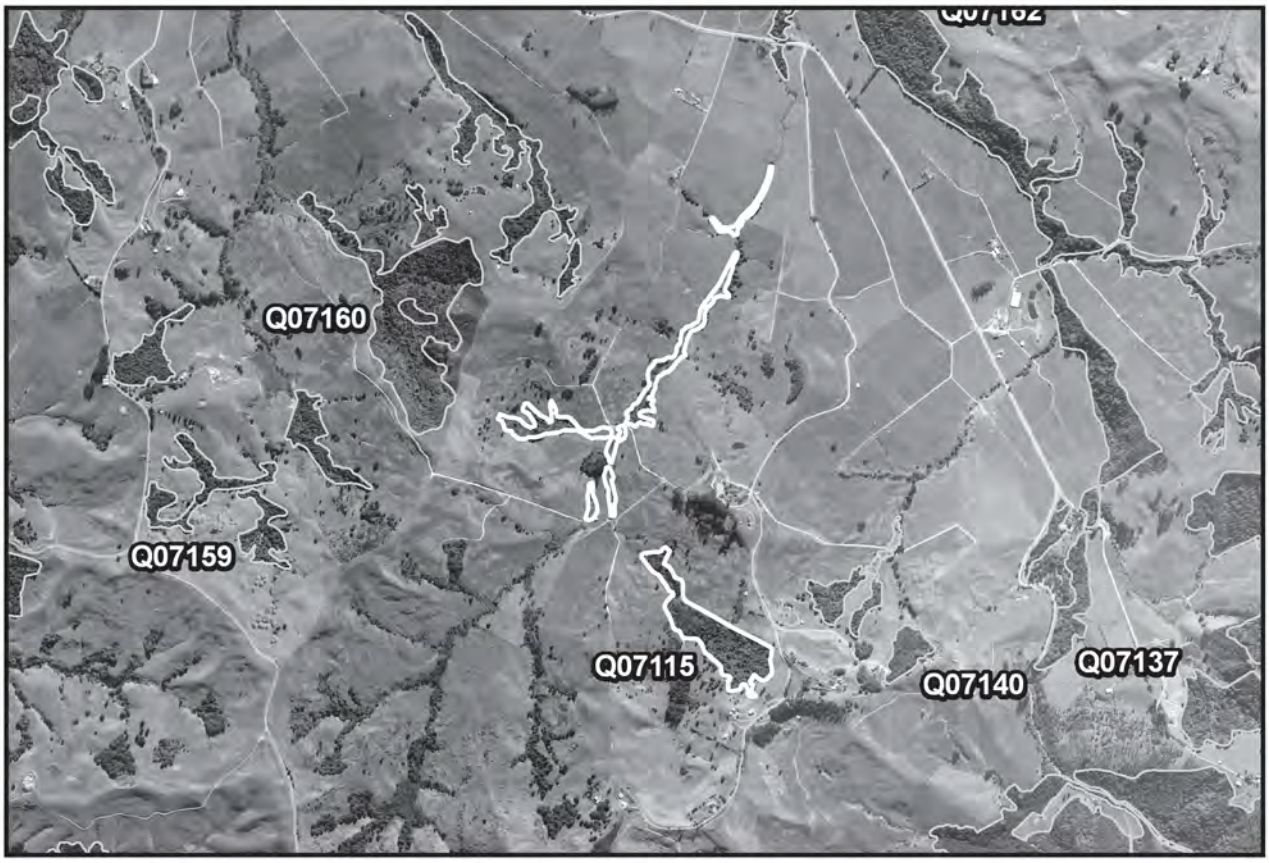
Ecological units

(a) Totara forest on moderate hillslope and in gully (65%)

(b) Raupo reedland in gully (20%)

(c) Crack willow treeland in gully (10%)

(d) Harakeke flaxland in gully (5%)

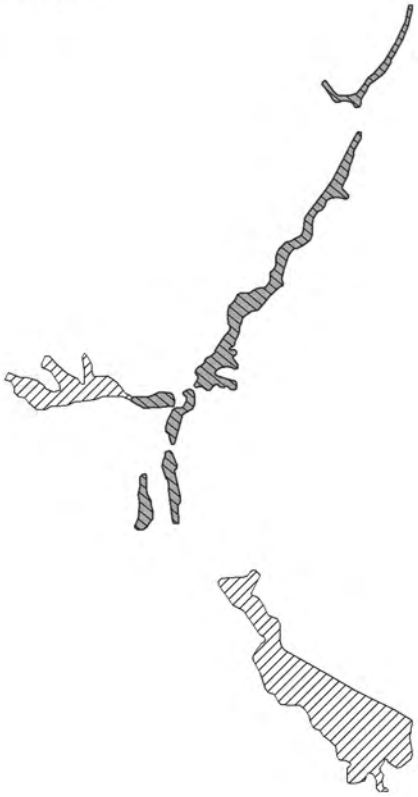


Q07/115 Ngatoka Wetland Catchment

0 500 1,000
Metres

Habitat Type

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



Landform/geology

Gullies underlain by Miocene sandy mudstone (Waitemata Group).

Vegetation

This site comprises a narrow band of vegetation adjacent to an upper tributary of the Tauraroa River. Two small forest remnants in the catchment are included in the site, the largest of which is at least partly fenced to exclude stock. The upper wetland area is covered in crack willow treeland (c) and is grazed; the lower wetland area has been fenced and planted, primarily in harakeke (d). The site was surveyed from Ngatoka Road, which allowed views of the totara forest (a) and raupo reedland (b); descriptions of the remaining vegetation types were derived from discussions with the landowner.

Fauna

Grey duck (Nationally Endangered) and grey duck–mallard hybrids reportedly breed on the farm pond adjacent to Mangapai Caves Road to the north, and may also utilise the wetland habitat within the site. Pukeko, tui and pied stilt are also present (landowner pers. comm.). Paradise shelduck, Australasian harrier, NZ kingfisher, grey warbler, North Island fantail and grey duck were recorded in 1978 (SSBI Q07/R07/H 053).

Significance

This site is one of only a very few natural or semi-natural wetlands remaining in the ED which in total cover *c.* 45 ha. Although still in a semi-natural state, this wetland has been modified by planting, weed invasion, and grazing, and is therefore a Level 2 site. The totara forest and crack willow treeland are grazed by cattle, and the harakeke flaxland has developed from recent plantings. The site provides some riparian protection to a tributary of the Tauraroa River. Grey duck (a threatened bird species) may use the site, but this has not been confirmed.

PAKOUHOKIO KNOLL FOREST

Survey no.	Q07/122
Survey date	15 November 2006
Grid reference	Q07 359958 (6 remnants)
Area	65.7 ha (63.1 ha forest, 2.6 ha wetland)
Altitude	2–120 m asl

Ecological units

(a) Kanuka forest on moderate hillslope (88%)

(b) Kanuka treeland on moderate hillslope (10%)

(c) Raupo reedland in gully (2%)

(d) Open water in constructed pond (<1%)

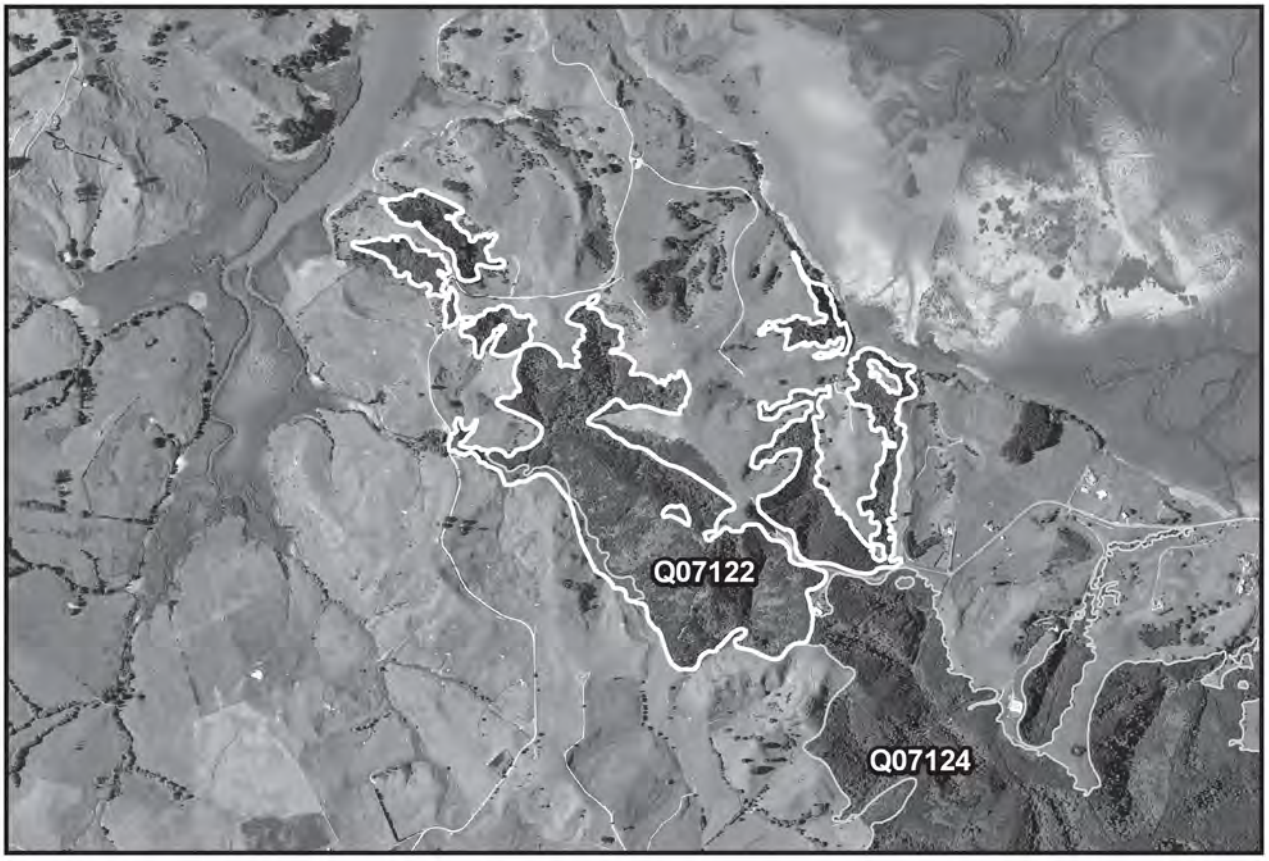
Landform/geology

Dissected hill country on Mesozoic greywacke (Waipapa Terrane).

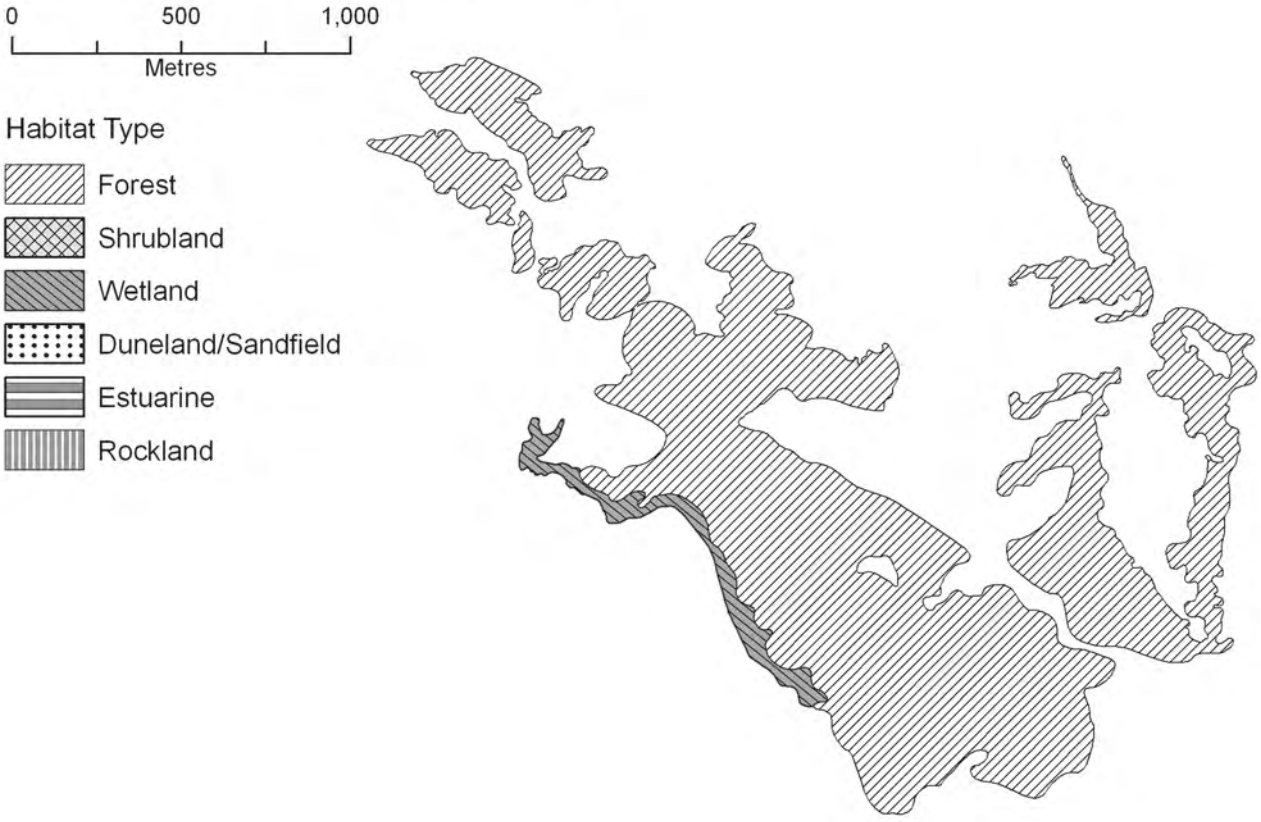
Vegetation

This site comprises a kanuka-dominant forest remnant with contiguous wetland. The site is grazed by stock and has only a sparse understorey. The wetland was created when a small stream was dammed, and includes reedland and open water.

(a) The majority of the site is secondary forest. Kanuka is dominant with frequent mamaku and occasional kauri, tanekaha, kowhai, ti kouka, rimu, kahikatea, kohekohe, rewarewa, and tarata. The kauri and tanekaha are ricker-sized trees



Q07/122 Pakouhokio Knoll Forest



emergent through the kanuka canopy, and no mature podocarps or kauri are present. There are occasional exotics including woolly nightshade, radiata pine, and maritime pine.

(b) On the edges of the remnant, particularly on its northern edge in the vicinity of the road and pa sites, the kanuka forest grades into kanuka treeland. Gorse is frequent here, with occasional puriri, totara, kahikatea, rewarewa, mahoe, and ti kouka. The grazed pasture underneath and adjacent to the treeland is primarily kikuyu grass and soft brome, with occasional ratstail and paspalum.

(c) Raupo reedland occurs on the edges of the constructed pond and in the wetland that feeds into the pond. Giant spike sedge, *Polygonum* sp., and *Azolla* sp.* are frequent, with occasional ti kouka, harakeke, soft rush, and crack willow.

(d) The deeper, central areas of the constructed pond are open water with occasional *Azolla* sp.

Fauna

Paradise shelduck, welcome swallow and NZ kingfisher were present in the wetland in this present survey. A taped recording of spotless crake was played adjacent to the wetland and there was no response.

Significance

The site is not representative for any ecological unit. All of the forest and wetland areas are grazed, and emergent radiata pines are scattered throughout the site, hence Level 2 status. However, freshwater wetlands have been greatly reduced in extent throughout New Zealand, and only approximately 45 ha of natural or semi-natural wetland remains in Waipu ED. The site is contiguous with the much larger Takahiwai Forest (Q07/124) and provides riparian protection for several small streams that drain into Whangarei Harbour. Three pa sites are present on the upper ridges.

WAIPU CAVES ROAD WETLAND

Survey no.	Q07/123
Survey date	15 November 2006
Grid reference	Q07 364835 (2 remnants)
Area	0.4 ha
Altitude	40 m asl

Ecological unit

(a) Raupo reedland in gully (100%)

Landform/geology

Valley floor wetlands on Holocene alluvium.

Vegetation

This site comprises two small wetland remnants in a small tributary of North River. The larger remnant, on the southern side of Mountfield Road, extends parallel to the road. A smaller remnant lies approximately 100 m northeast of this remnant, on the northern side of Mountfield Road. This site appears to have been severely reduced in extent since it was surveyed in 1978 (SSBI Q07/R07/060) and the two surviving remnants were probably once part of one large wetland. Raupo reedland (a) forms the vegetation cover with occasional wheki, karamu, and *Carex virgata*.

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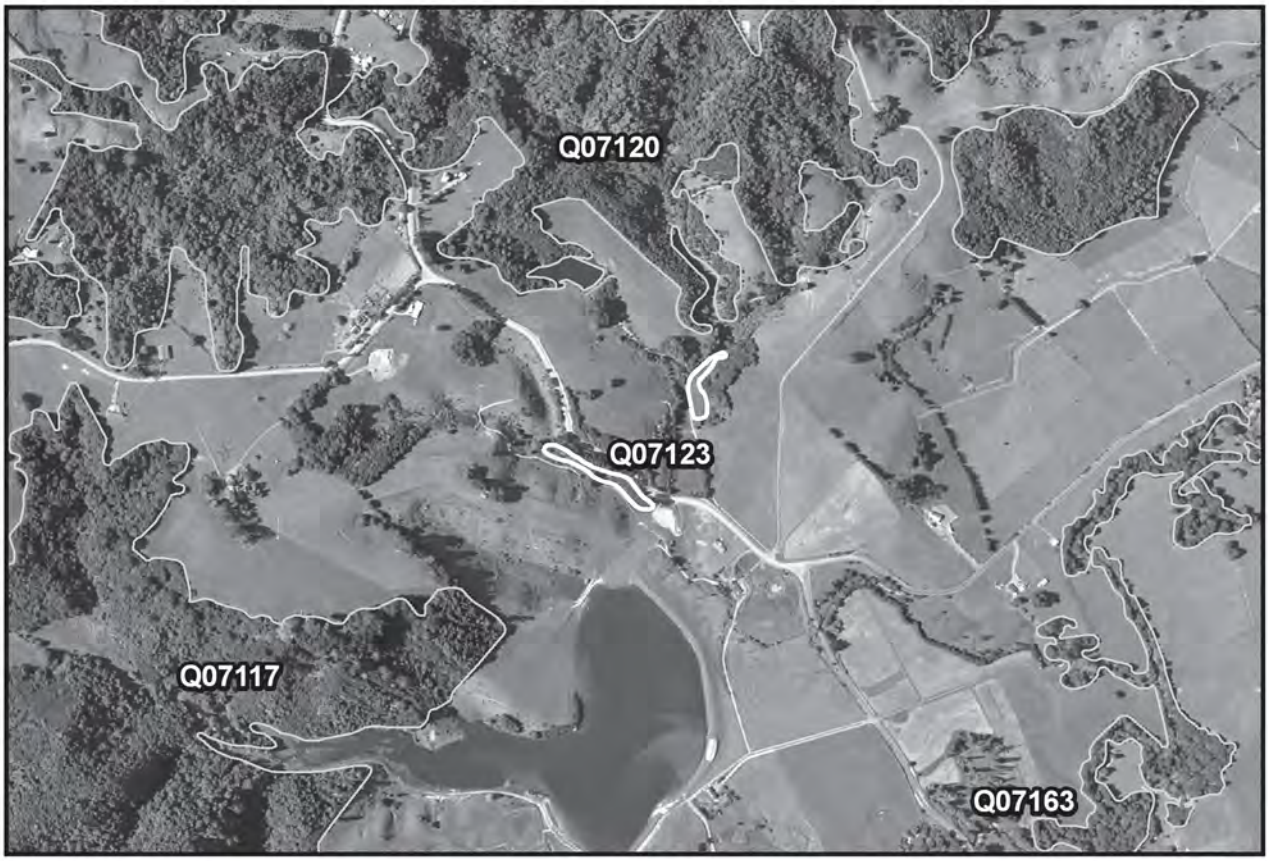
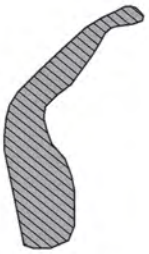
* This could be either the indigenous floating fern species (*Azolla filiculoides*) or the exotic species (*Azolla pinnata*).

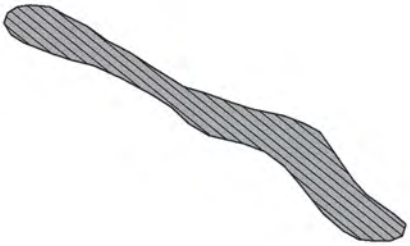


Q07/123 Waipu Caves Road Wetland

0 250 500
Metres

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





Fauna

Spotless crake (Sparse), marsh crake (Sparse), banded rail (Sparse), Australasian harrier, pukeko, welcome swallow, grey warbler, and North Island fantail recorded in 1978 (SSBI Q07/R07/060). A taped recording of spotless crake was played at the site during this survey and there was no response. However, the wetlands are of sufficient size to be used by spotless crake, which can move between wetlands at night (John Kendrick pers. comm.).

Significance

These two areas of raupo reedland are the small, grazed remnants of a formerly larger wetland. Freshwater wetlands have been greatly reduced in extent throughout New Zealand, and only approximately 45 ha of natural or semi-natural wetland remains in Waipu ED. The site is near the extensive forest remnants in the North River catchment (Q07/117). The site supported three threatened bird species at the time of a survey in 1978 (spotless crake, marsh crake, and banded rail) but the continued presence of these species to the present day could not be confirmed. In their current state and with current management these wetlands are not sustainable over time therefore this site is ranked as Level 2.

CRUTCHER ROAD FOREST REMNANTS

Survey no.	Q07/133
Survey date	12 November 2006
Grid reference	Q07 252870 (2 remnants)
Area	7.2 ha
Altitude	95–122 m asl

Ecological unit

(a) Totara forest on moderate hillslope and in gully (100%)

Landform/geology

Hillslope underlain by melange (undifferentiated Mangakahia and Motatau Complex lithologies).

Vegetation

The site comprises small remnants of totara forest on south-facing hillslopes and gullies above a tributary of the Waiotira Stream. Totara is abundant, with frequent nikau and kahikatea, and occasional kanuka, rewarewa, ti kouka, kauri, pukatea, mamaku and ponga. This site is not fenced and appears heavily grazed underneath. Because it is more resistant to stock impacts, totara tends to line the edges of the forest, while other more sensitive species are found behind the protective totara margin; especially within gullies, which are harder for stock to access.

Fauna

Not surveyed.

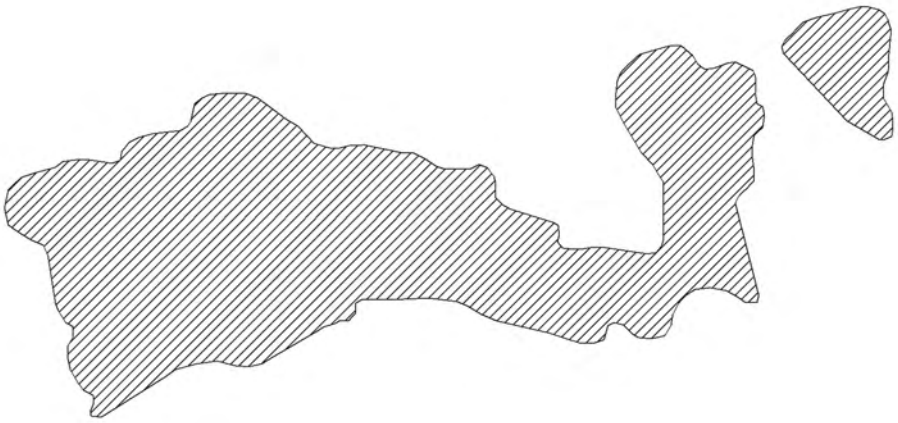
Significance

This is a relatively small, isolated site with a forest type that is relatively common. It may be part of a habitat network for mobile bird species such, as kukupa, which are able to move between multiple dispersed remnants of indigenous forest in search of food. The western hill country of Waipu ED has been mostly cleared of forest, therefore this site is at least of Level 2 significance.

Q07/133 Crutcher Road Forest Remnants

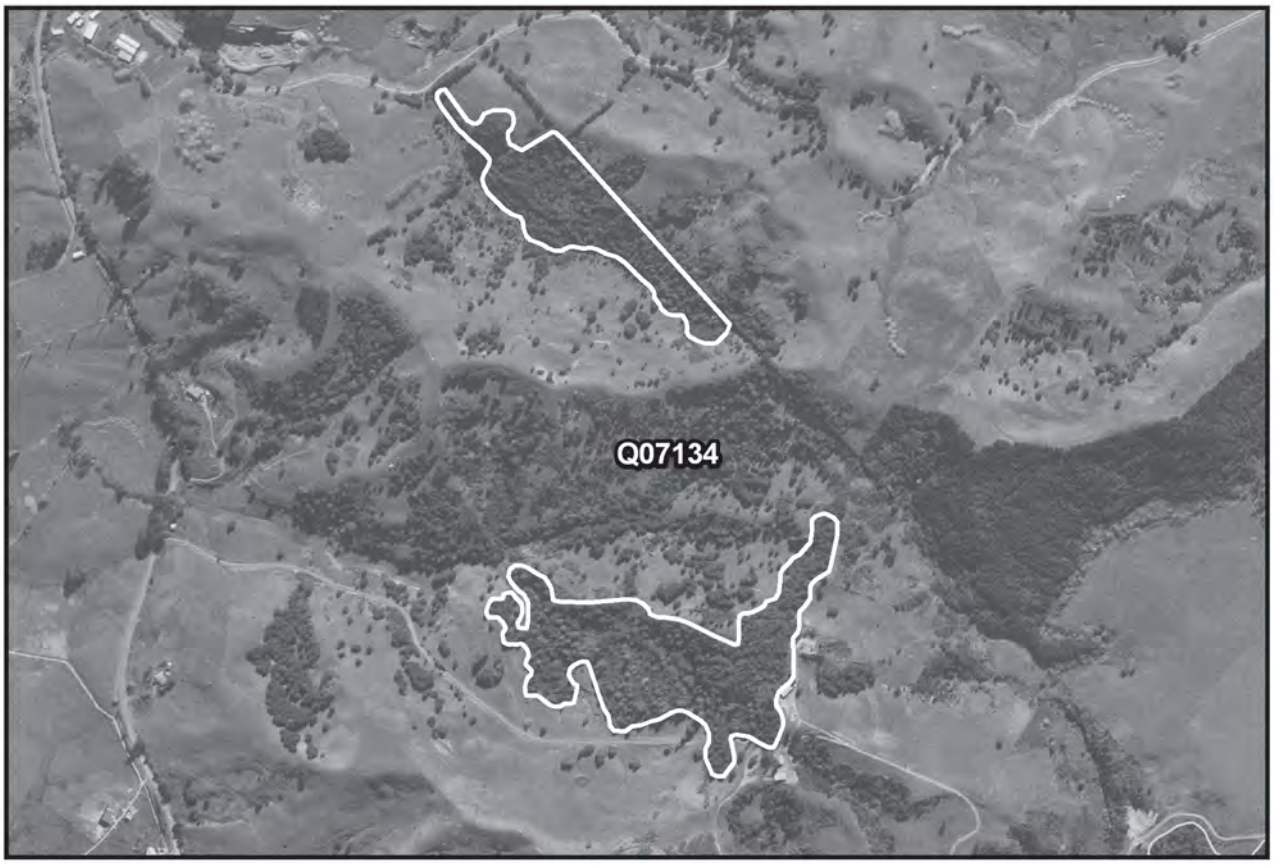
0 250 500
Metres

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



REID ROAD FOREST REMNANTS

Survey no.	Q07/134
Survey date	12 November 2006
Grid reference	Q07 280826 (2 remnants)
Area	11.3 ha
Altitude	80–160 m asl

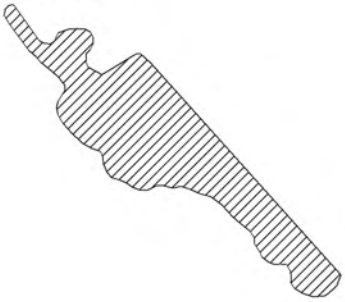


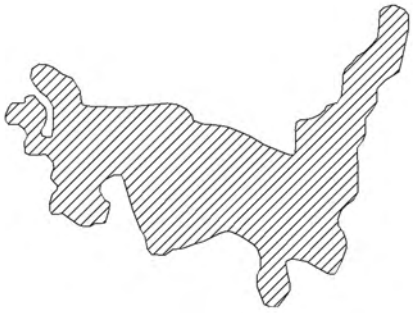
Q07/134 Reid Road Forest Remnants

0 250 500
Metres

Habitat Type

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





Ecological unit

(a) Totara–kahikatea forest on moderate hillslope and in gully (100%)

Landform/geology
Hillslopes and gully underlain by Miocene sandy mudstone (Waitemata Group).

Vegetation
This site comprises two small remnants of indigenous forest on rolling hill country north of Reid Road and south of McConnell Road, set within a mosaic of open pasture and pasture with scattered totara and gorse. The northern remnant was not visible during the survey, but was judged similar to the southern remnant on the basis of aerial photographs flown in 2004. Totara and kahikatea form the main forest canopy, with frequent nikau and occasional taraire, puriri, pukatea, ti kouka, kiekie, kahakaha, *Metrosideros perforata*, and northern rata. Stock and possum impacts were visible in the southern remnant, for example the single northern rata observed was largely defoliated and almost dead.

Significant flora
Northern rata (regionally significant).

Fauna
Grey warbler.

Significance
This is a small, isolated site comprising a relatively common forest type. The western hill country of Waipu ED has been mostly cleared of forest and these remnants may be part of a habitat network for mobile bird species, such as kukupa, which are able to move between multiple dispersed remnants of indigenous forest in search of food. A regionally significant plant species (northern rata) was recorded, but it was a single individual in very poor condition which is unlikely to persist in the site under current pressures (i.e. evidently severe possum browse).

HEWLETT QEII COVENANT

Survey no.	Q07/136
Survey date	10 November 2006
Grid reference	Q07 371909
Area	2.1 ha
Altitude	20–20 m asl

Ecological unit
(a) Kahikatea treeland on alluvium (100%)

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

Vegetation
The Hewlett Queen Elizabeth II Open Space Covenant is an isolated stand of kahikatea trees with frequent puriri and totara, and occasional ti kouka, located on an alluvial terrace of the Ruakaka River. It is fenced with a five-wire post fence (no battens). The understorey appears to be largely exotic grasses and wild carrot, with frequent *Coprosma rhamnoides*, occasional arum lilies, and limited regeneration of puriri and totara. It appears that the site was fenced to exclude stock only recently.

Fauna
Not surveyed.

Q07/136 Hewlett QEII Covenant

0 250 500
Metres

Habitat Type

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

Significance

This is very small example of an uncommon habitat type (indigenous alluvial vegetation), but it is relatively small and the understorey is sparse. The density of the understorey is likely to increase over the next 10–20 years following recent fencing. Its location near the Ruakaka River Forest Remnants (Q07/119) will assist vegetation recovery, for example through seed dispersal by birds as they travel along the river. 82% (1.7 ha) of the site is formally protected under a Queen Elizabeth II Open Space Covenant, and the remaining unprotected trees are on the periphery.

MANGAPAI CAVES ROAD WETLAND

Survey no.	Q07/140
Survey date	13 November 2006
Grid reference	Q07 285898 (4 remnants)
Area	3.6 ha (3.2 ha forest, 0.4 ha wetland)
Altitude	120–160 m asl

Ecological units

(a) Totara forest in gully (75%)

(b) Raupo reedland in gully (24%)

(c) Open water in constructed pond (1%)

Landform/geology

Gullies underlain by Miocene sandy mudstone (Waitemata Group).

Vegetation

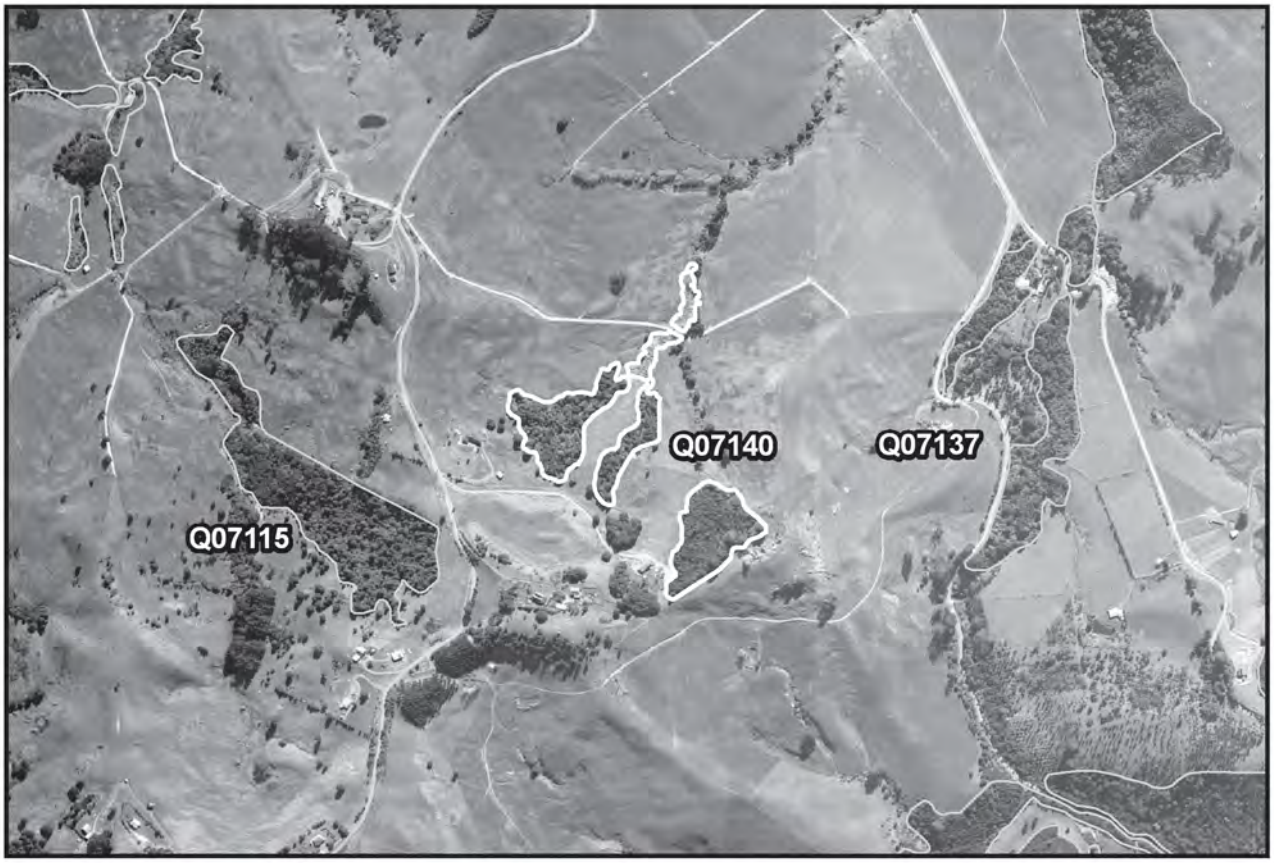
This site is a small wetland with three adjacent forest remnants in gullies surrounded by pasture. The forest remnants are at least partly fenced to exclude stock, and the raupo reedland is probably also fenced. There are three remnants of totara forest (a) in the gullies that feed into the wetland. Kanuka is frequent, with occasional ti kouka, rimu, pukatea, mamaku, kiokio, rewarewa, kauri, gorse, dally pine, macrocarpa, and radiata pine. The wetland, which includes a small area of open water (c), is covered in raupo reedland (b) with occasional arum lily, Japanese honeysuckle, ti kouka, and manuka.

Fauna

Not surveyed.

Significance

Although this site contains freshwater wetland (which is a rare habitat type in the ED), it is a Level 2 site because it is small, isolated, partly grazed by stock, and weed-infested. The wetland provides some riparian protection for a tributary of the Tauraroa River.

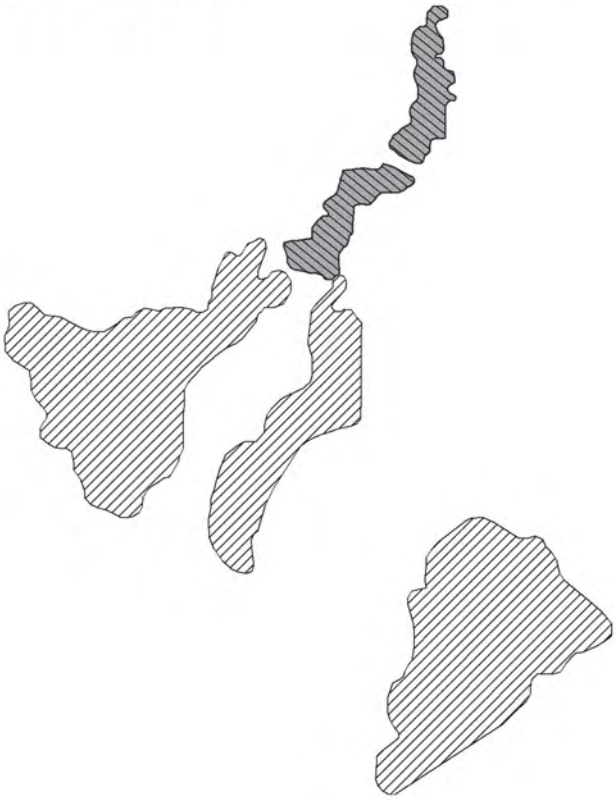


Q07/140 Mangapai Caves Road Wetland

0 250 500
Metres

Habitat Type

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



SANDFORD ROAD FOREST REMNANTS

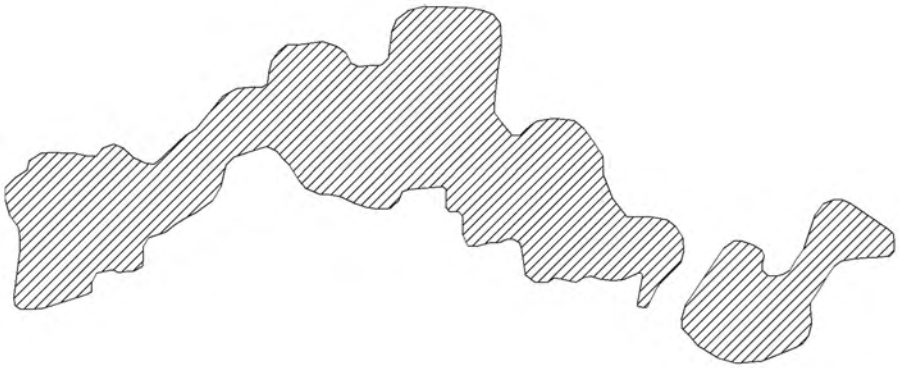
Survey no.	Q07/142
Survey date	14 November 2006
Grid reference	Q07 401875 (2 remnants)
Area	2.8 ha
Altitude	20 m asl

Q07/142 Sandford Road Forest Remnants

0 250 500
Metres

Habitat Type

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



Ecological units

(a) Totara treeland on alluvium (95%)

(b) Kahikatea–totara treeland on alluvium (5%)

Landform/geology

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

Vegetation

This site comprises several small indigenous treeland remnants on the alluvial floodplain of an unnamed stream flowing through agricultural land into Doctor's Hill Road Wetland (Q07/127) and ultimately into the Ruakaka River Estuary (Q07/130). Two treeland types are present: totara treeland (a) with frequent kahikatea and puriri, and occasional karaka, kowhai, mapou, ti kouka and woolly nightshade; and kahikatea–totara treeland (b) with frequent puriri. Stock damage is evident throughout, e.g. pugging of soil and lack of understorey. Die-back of puriri crowns is also noticeable. Domesticated geese are kept in part of the site.

Fauna

Grey warbler, pukeko.

Significance

This site contains small examples of treeland on alluvium. However, whilst indigenous vegetation is now very uncommon on alluvial flats in the ED, these areas are not considered representative due to small size and general degradation. This site is one of the only forest remnants on alluvial flats near Ruakaka township, and may provide an ecological linkage between the coast and the larger forested hill country areas inland (such as Ruakaka Forest Q07/121). Approximately half the site (1.36 ha) is within a WDC-administered esplanade reserve.

HAYWARD ROAD FOREST REMNANT

Survey no.	Q07/146
Survey date	10 November 2006
Grid reference	Q07 223929
Area	1.9 ha
Altitude	60–100 m asl

Ecological unit

(a) Totara forest on moderate hillslope (100%)

Landform/geology

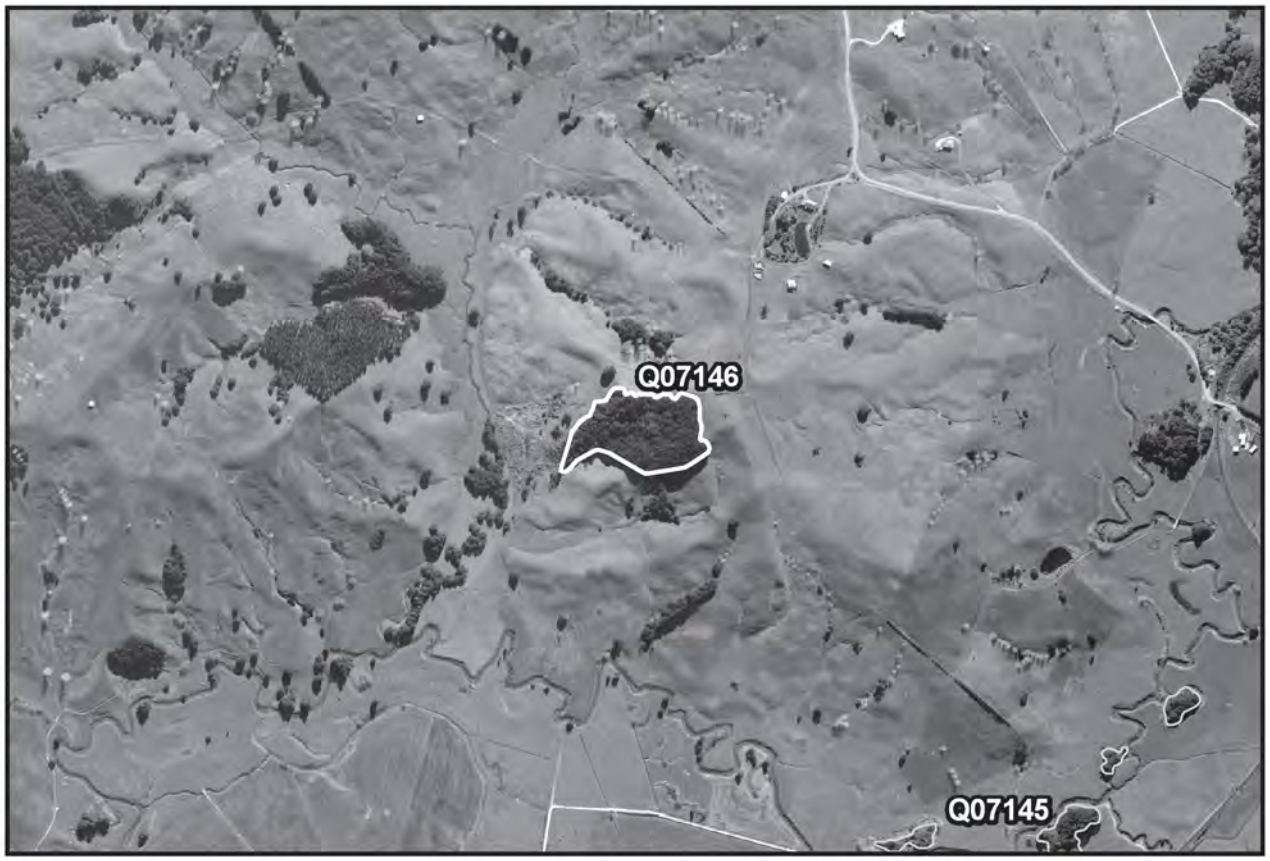
Hillslope underlain by melange (undifferentiated Mangakahia and Motatau Complex lithologies).

Vegetation

This site is an isolated forest remnant in the Tauraroa River catchment. The canopy is dominated by totara and there are occasional taraire and rewarewa. The stand probably regenerated following Maori or European clearance as no emergent podocarps are present. It is not clear whether the remnant is grazed or fenced to exclude stock.

Fauna

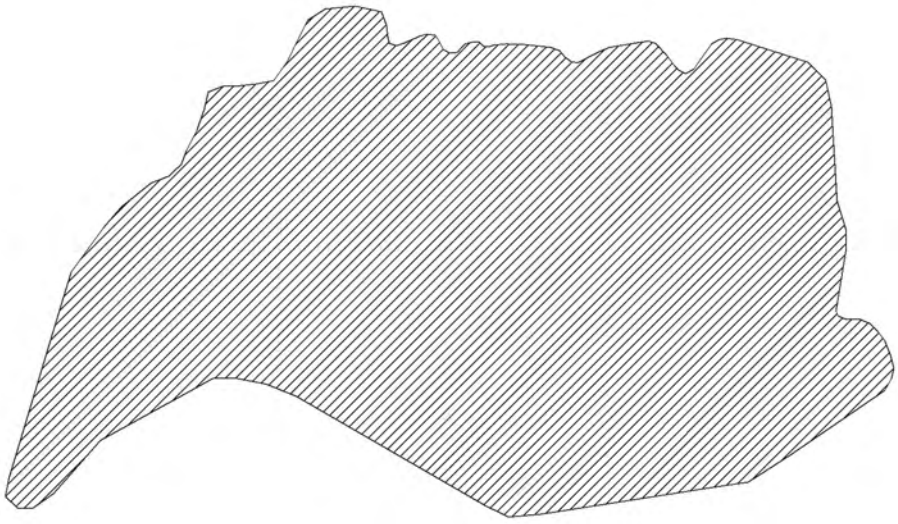
Not surveyed.



Q07/146 Hayward Road Forest Remnant

0 250 500
Metres

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

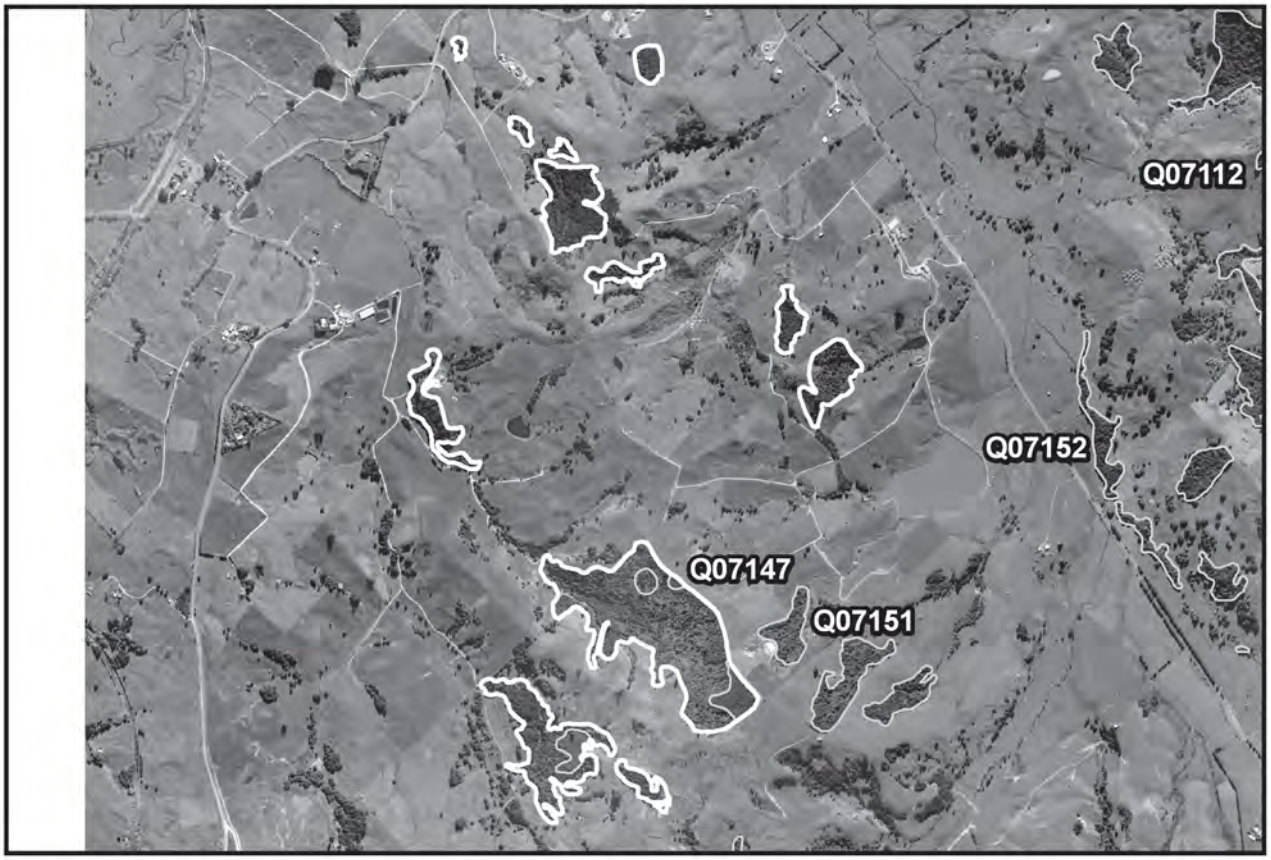


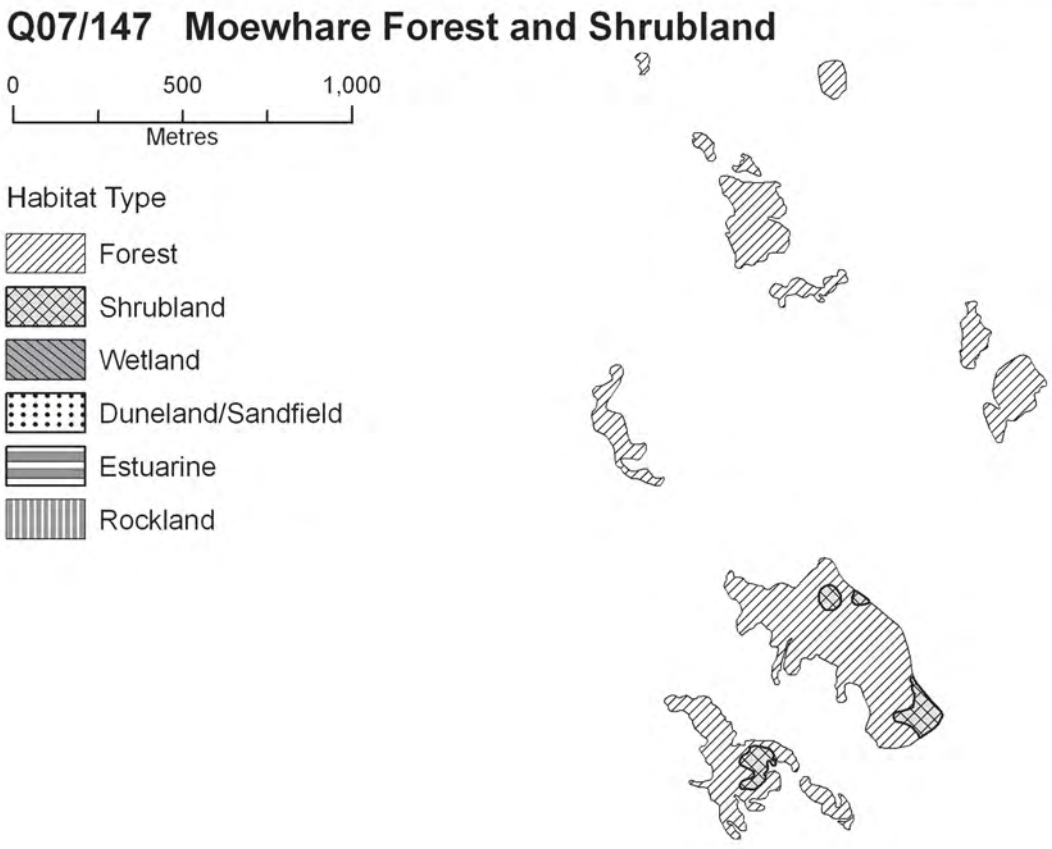
Significance

The remnant is small, secondary, and probably grazed. However, the site may be important as part of a habitat network for mobile species such as kukupa, acting as a link between the small forest remnants of the northwestern Waipu ED and larger forest areas to the west such as the Tangihua Range. The western hill country of Waipu ED has been mostly cleared of forest, therefore this site has therefore been assigned Level 2 significance, in recognition of its value as a habitat stepping stone.

MOEWHARE FOREST AND SHRUBLAND

Survey no.	Q07/147
Survey date	10 November 2006
Grid reference	Q07 228904 (13 remnants)
Area	33.6 ha (31.2 ha forest, 2.4 ha shrubland)
Altitude	60–140 m asl





Ecological units

(a) Totara–kanuka forest on moderate hillslope (50%)

(b) Totara forest on moderate hillslope and on ridge (30%)

(c) Manuka shrubland on gentle hillslope (11%)

(d) Kanuka–totara forest on moderate hillslope (5%)

(e) Kanuka forest on gentle hillslope (2%)

(f) Manuka–ponga shrubland on moderate hillslope (1%)

(g) Kahikatea forest in gully head (1%)

(h) Kahikatea forest on alluvium (<1%)

Landform/geology

Hillslopes and gullies underlain by ?Mangakahia Complex mudstone.

Vegetation

This site comprises 13 forest and shrubland remnants bordered by Paparoa Road, Waiotira Road and Russek Road. The surrounding land use is pastoral farming and all of the remnants appeared to be grazed with a sparse understorey. Totara–kanuka forest (a), totara forest (b), kanuka–totara forest (d), and kanuka forest (e) occurs on hillslopes, and kahikatea forest occurs in gully heads (g) or on alluvium (h). Within these forest types, ponga, kohuhu, kanuka, ti kouka, and radiata pine are frequent or occasional. Manuka shrubland (c) and manuka–ponga shrubland (f) is present on the hill slopes, and these areas have localised infestations of pampas and black wattle. A small area of totara forest occurs on a ridge (b).

Fauna

Australasian harrier and pukeko were recorded in this survey.

Significance

This site comprises small, widely scattered, grazed examples of common forest and shrubland types, and has localised infestations of pampas and black wattle, therefore none of the ecological units are considered representative. These remnants provide some riparian protection to small streams within the upper Tauraroa River catchment, and may be a corridor for wildlife movement in a highly deforested landscape.

PAPAROA ROAD DAM FOREST REMNANTS

Survey no.	Q07/151
Survey date	10 November 2006
Grid reference	Q07 235900 (3 remnants)
Area	5.8 ha
Altitude	81–135 m asl

Ecological unit

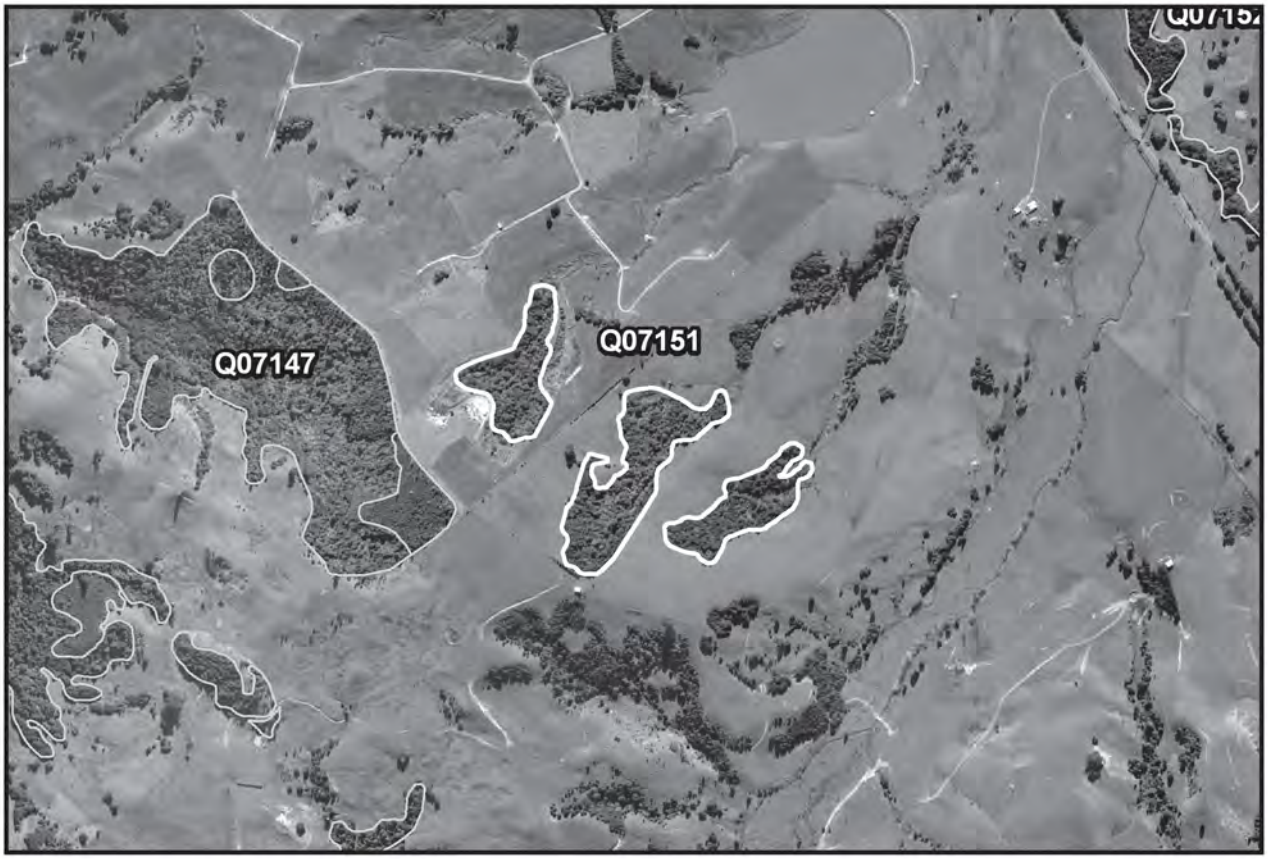
(a) Totara forest on moderate hillslope (100%)

Landform/geology

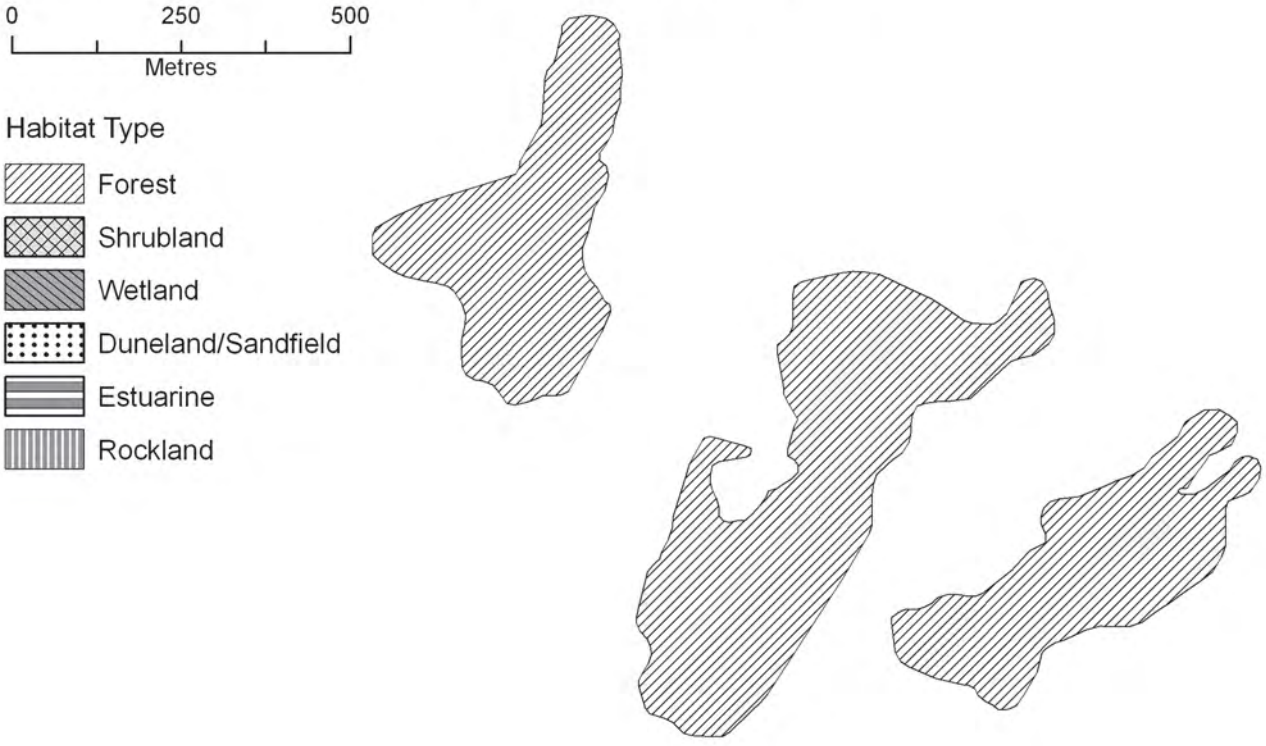
Gullies underlain by ?Mangakahia Complex mudstone.

Vegetation

This site comprises three small forest remnants to the west of Paparoa Road near a dam. The land surrounding each of the remnants is covered in pasture. All of the



Q07/151 Paparoa Road Dam Forest Remnants



remnants are totara forest (a) with frequent kahikatea and occasional tawa, rewarewa, mamaku, manuka, kanuka, kohuhu, and pampas. The site was surveyed from the road, approximately 700 m from the forest remnants, and it is not known if it is fenced.

Fauna

Not surveyed.

Significance

The site is relatively small and possibly grazed. It may be important as part of a habitat network for mobile species such as kukupa, acting as a link between the Moewhare Forest and Shrubland (Q07/147), and the Ruarangi Road Forest Remnants (Q07/112). The western hill country of Waipu ED has been mostly cleared of forest, therefore this site has therefore been assigned Level 2 significance, in recognition of its value as a habitat stepping stone.

RUARANGI ROAD FOREST REMNANTS 3

Survey no.	Q07/153
Survey date	11 November 2006
Grid reference	Q07 259887 (8 remnants)
Area	17.9 ha
Altitude	80–165 m asl

Ecological units

(a) Totara forest in gully (50%)

(b) Totara–radiata pine forest on moderate hillslope (20%)

(c) Towai forest on steep hillslope (20%)

(d) Nikau–ponga forest in gully (5%)

(e) Nikau–ponga treeland in gully (3%)

(f) Pukatea–kahikatea–totara forest in gully head (1%)

(g) Kahikatea–totara forest on moderate hillslope (1%)

Landform/geology

Hillslopes and gullies of Mesozoic greywacke (Waipapa Terrane) and Miocene sandy mudstone (Waitemata Group).

Vegetation

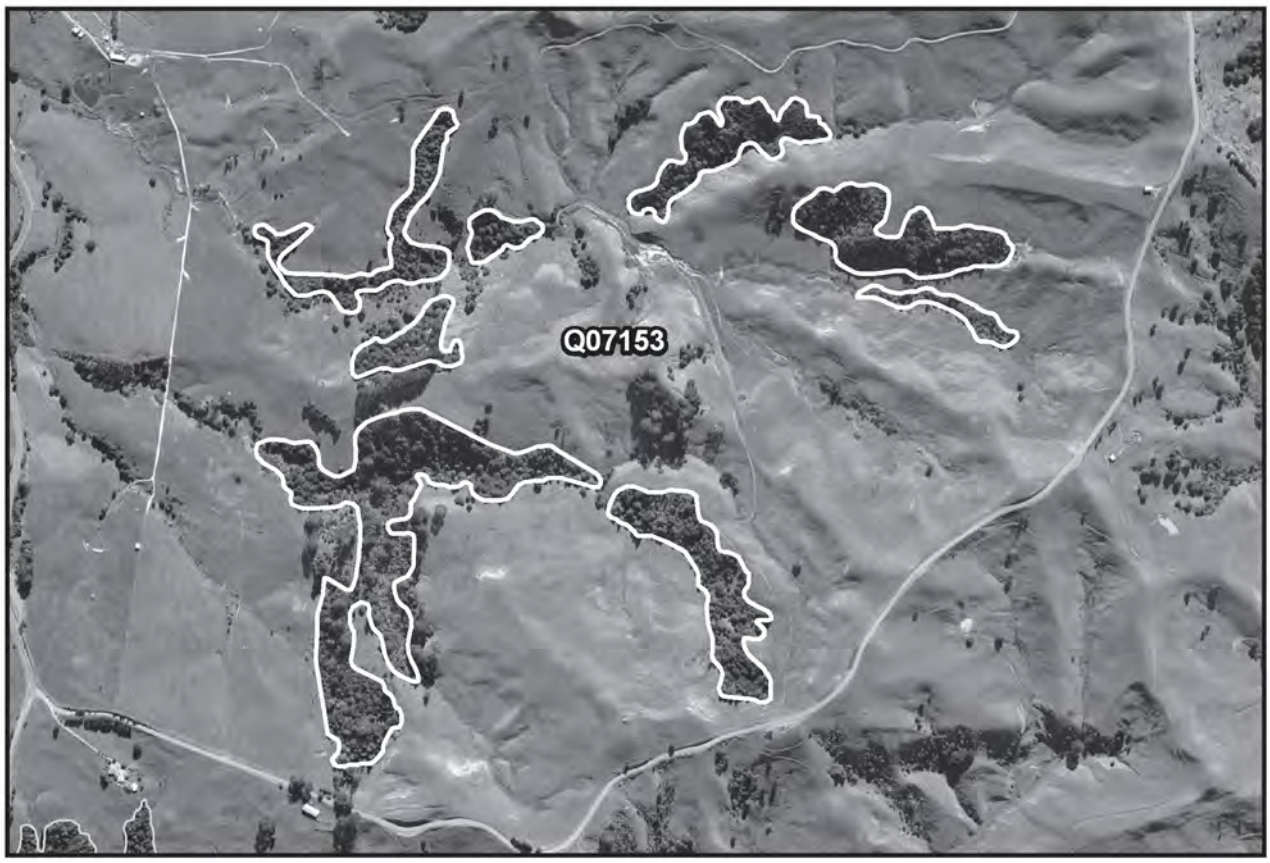
This site comprises eight forest remnants in the headwaters of a tributary of the Tauraroa River. The remnants are in gullies on moderately to steeply rolling farmland and all appear to be grazed. The remnants are diverse, with the dominant species changing according to topography and forest age. The absence of any mature, emergent podocarps suggests that all the remnants have regenerated following human clearance. In several places the forest remnants grade into treeland which provides important linkages between them.

(a) The most common forest type is totara forest in gullies. Totara is abundant and kahikatea is frequent in this type. Kauri, radiata pine, ti kouka, kanuka, ponga, kohekohe, and puka are occasional.

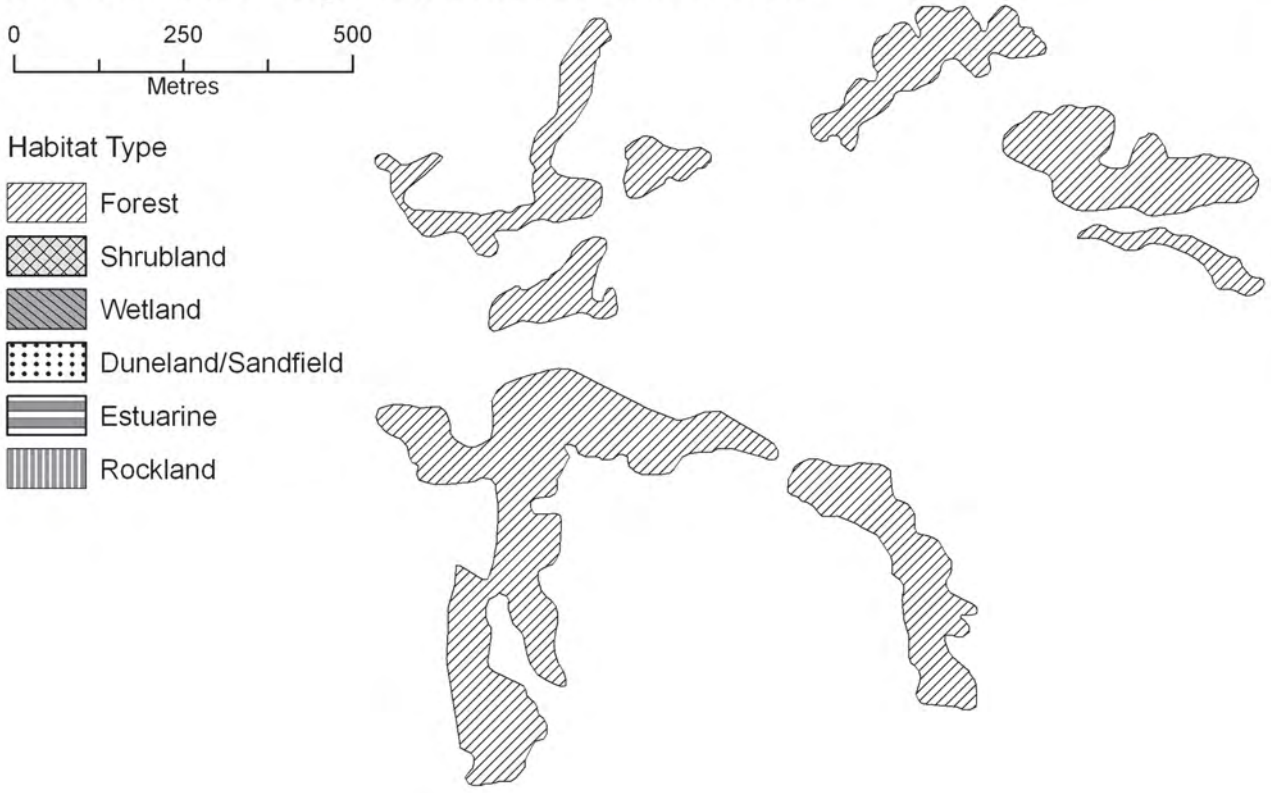
(b) The southwesternmost remnant is totara forest. Mature, emergent radiata pines are common, kahikatea is frequent, and rimu, towai, mamaku, ponga, and kanuka are occasional in this remnant.

(c) The larger remnant in the east, on a steep hillslope, is towai forest with frequent totara and rewarewa. Puriri, ponga, tawa, and pukatea are occasional.

(d) In the eastern gullies, ponga and nikau are the common forest dominants. Kanuka and pukatea are frequent, and rimu, rewarewa, and pate are occasional.



Q07/153 Ruarangi Road Forest Remnants 3



(e) The edges of the towai forest grade into ponga–nikau treeland with occasional kahikatea.

(f) In a gully head adjacent to Ruarangi Road is a small area dominated by pukatea, kahikatea and totara, with occasional nikau, ponga, lancewood, and supplejack.

(g) In the westernmost remnant, adjoining Ruarangi Road, is a small area with abundant kahikatea. Totara is common, kanuka is frequent, and mahoe, pukatea, and ponga are occasional.

Fauna

Australasian harrier was recorded in this survey.

Significance

The remnants on this site are all grazed and have been disturbed, and mature, emergent radiata pine are common in places. The linear shape of many of the individual remnants accentuates edge effects, and for these reasons this site is attributed Level 2 status. However, the present vegetation contains many elements of the diverse podocarp–broadleaf forest that formerly covered the catchment. Distinct changes in forest composition occur from gully to ridge, reflective of soil moisture and forest age. The remnants are also form part of a habitat network of forest patches that allow mobile forest bird species such as kukupa to move and feed across the landscape.

RUARANGI ROAD WETLAND

Survey no.	Q07/154
Survey date	11 November 2006
Grid reference	Q07 256931 (2 remnants)
Area	0.5 ha
Altitude	83–101 m asl

Ecological unit

(a) Raupo reedland in gully (100%)

Landform/geology

Gully in Miocene sandy mudstone (Waitemata Group), with Holocene alluvium on valley floor.

Vegetation

This site comprises two small areas of raupo reedland (a) with occasional pampas and gorse. The northern wetland is at least partly fenced. A small constructed pond, not included in the site, is located to the southwest of the southern wetland. The surrounding land is covered in pasture with occasional scattered trees including eucalyptus, ti kouka, mahoe, and macrocarpa.

Fauna

Not surveyed.

Significance

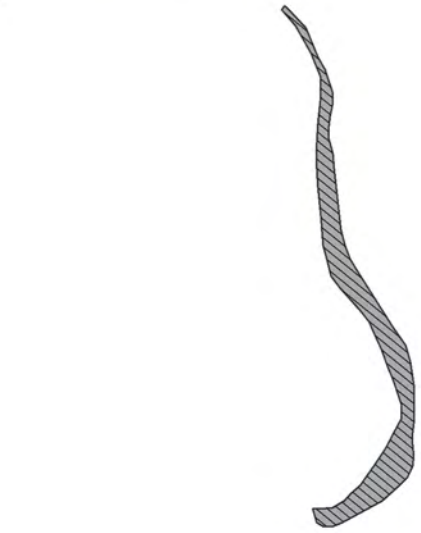
Few wetlands remain in the northwestern part of Waipu ED, and only two wetlands seen in this part of the ED were fenced or partly fenced to exclude stock. Most natural freshwater wetlands which were present in the ED have been drained or modified, and now only approximately 45 ha of natural or semi-natural wetland remains, but this wetland is small, isolated, and has infestations of pampas and gorse, and therefore is a Level 2 site. Only one part of the wetland has been fenced to exclude stock.

Q07/154 Ruarangi Road Wetland

0 250 500
Metres

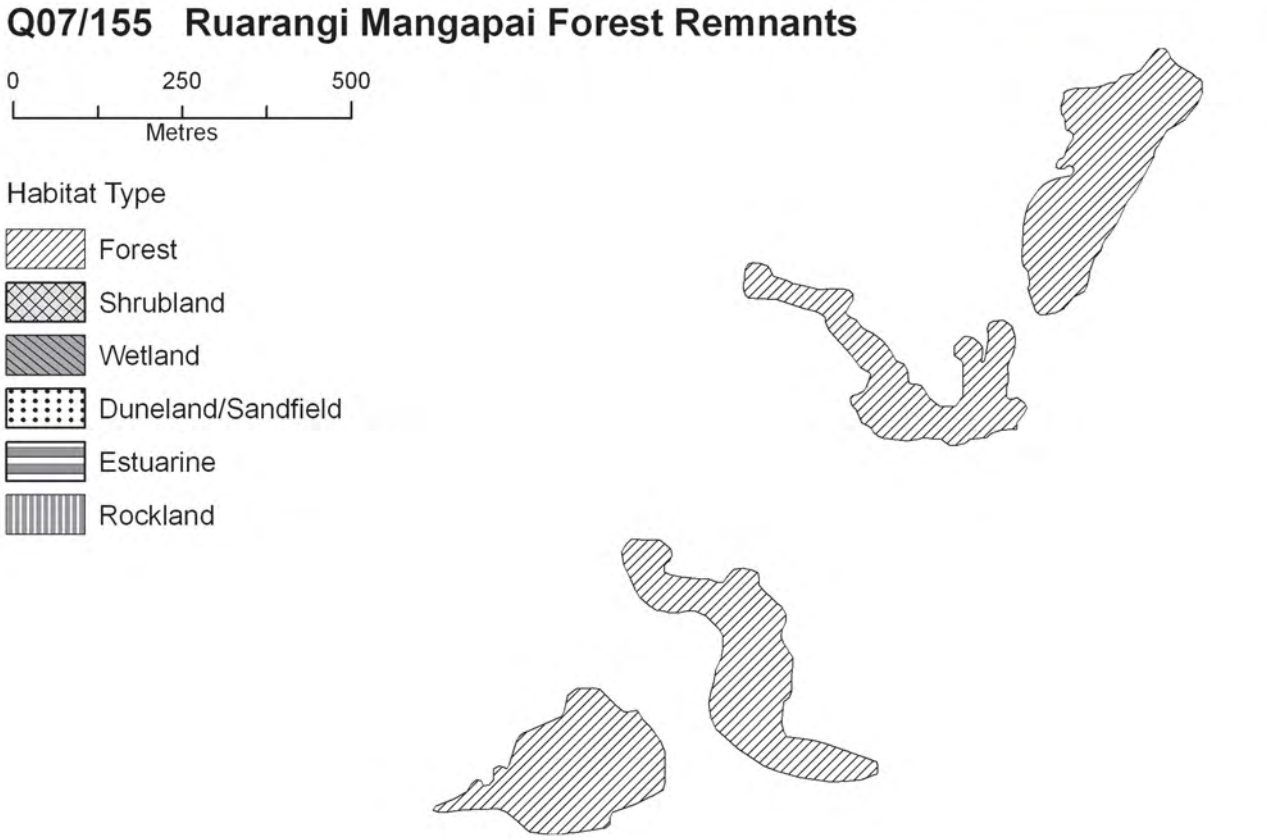
Habitat Type

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



RUARANGI MANGAPAI FOREST REMNANTS

Survey no.	Q07/155
Survey date	11 November 2006
Grid reference	Q07 259926 (4 remnants)
Area	7.3 ha
Altitude	80–130 m asl



Ecological units

(a) Totara–kanuka forest in gully (60%)

(b) Totara–kahikatea forest on gentle hillslope (40%)

Landform/geology

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

Vegetation

This site comprises four forest remnants between Mangapai Caves Road and Ruarangi Road, in the catchment of a tributary of the Tauraroa River. The surrounding land use is primarily pastoral farming, but the two southern remnants are linked by a band of mixed indigenous and exotic treeland, and the northern remnants are similarly linked. Crack willows along the adjacent stream links the two southern remnants and the two northern remnants. The presence or absence of fencing to exclude stock could not be determined from the road.

(a) The three northernmost remnants are in gullies. Totara and kanuka are common, and mamaku is frequent. A diverse range of indigenous species are occasional, including taraire, rewarewa, rimu, tawa, nikau, mahoe, ponga, titoki, kowhai, kohuhu, and pate.

(b) The southernmost remnant, on a gentle hillslope, is dominated by totara and kahikatea, with occasional rimu, kanuka, ti kouka, and mahoe.

Fauna

Two kukupa (Gradual Decline) were seen in the northernmost remnant.

Significance

The indigenous forest remnants within this site and the surrounding exotic vegetation act as corridors for forest bird species moving between Q07/112, Q07/114, Q07/157, and Q07/161. Although two kukupa (a threatened bird species) have been recorded in this site, this site does not warrant Level 1 significance between it is not considered to be of sufficient quality to be a key habitat for this species. The remnants are small, probably grazed, and are not representative of their ecological units.

RUARANGI ROAD FOREST REMNANTS 2

Survey no.	Q07/156
Survey date	11 November 2006
Grid reference	Q07 256901 (5 remnants)
Area	6.4 ha
Altitude	100–160 m asl

Ecological units

(a) Totara forest on moderate to steep hillslope (63%)

(b) Taraire–kahikatea forest in gully head (25%)

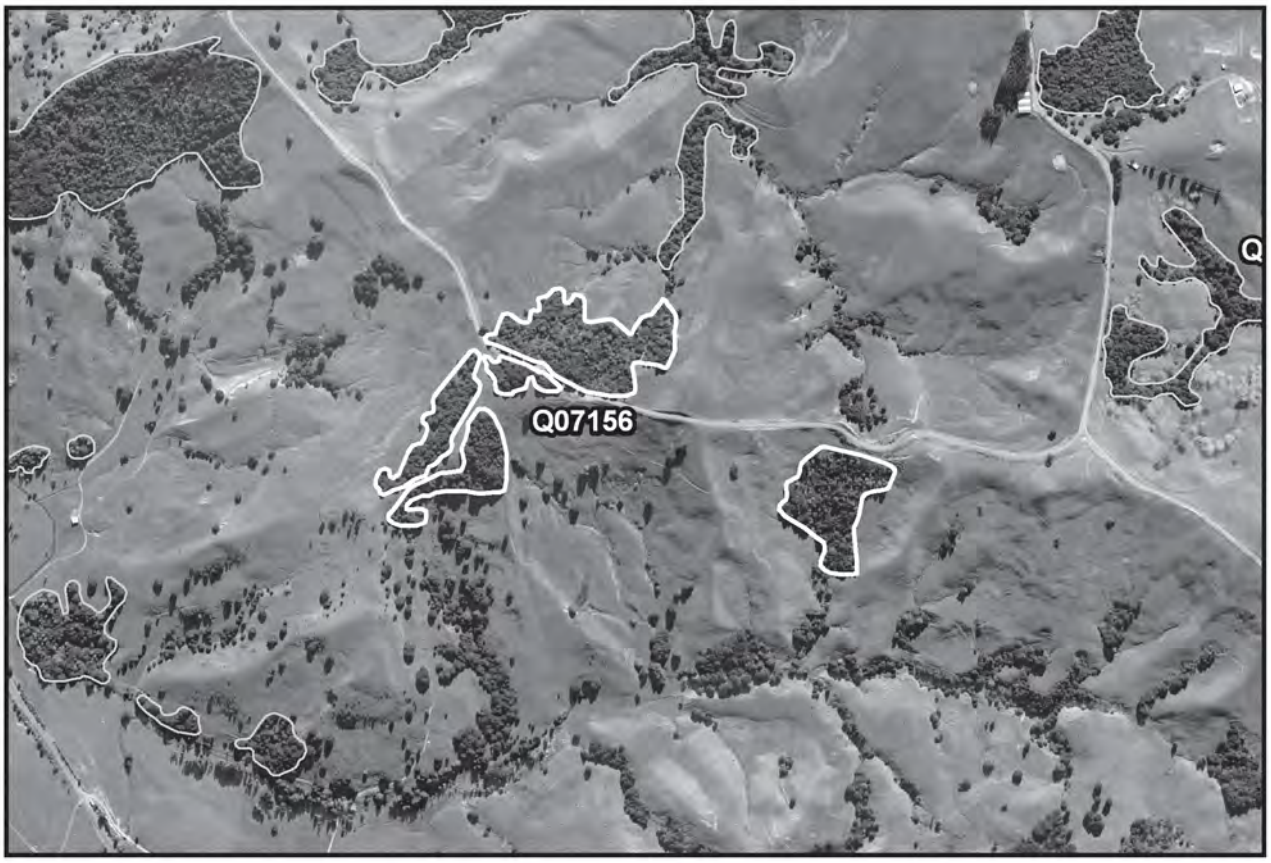
(c) Totara–taraire forest on moderate hillslope (12%)

Landform/geology

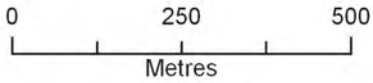
Hillslopes and gullies underlain by Miocene sandy mudstone (Waitemata Group).

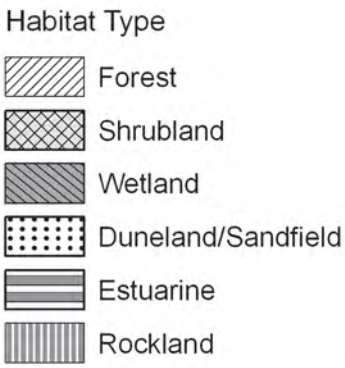
Vegetation

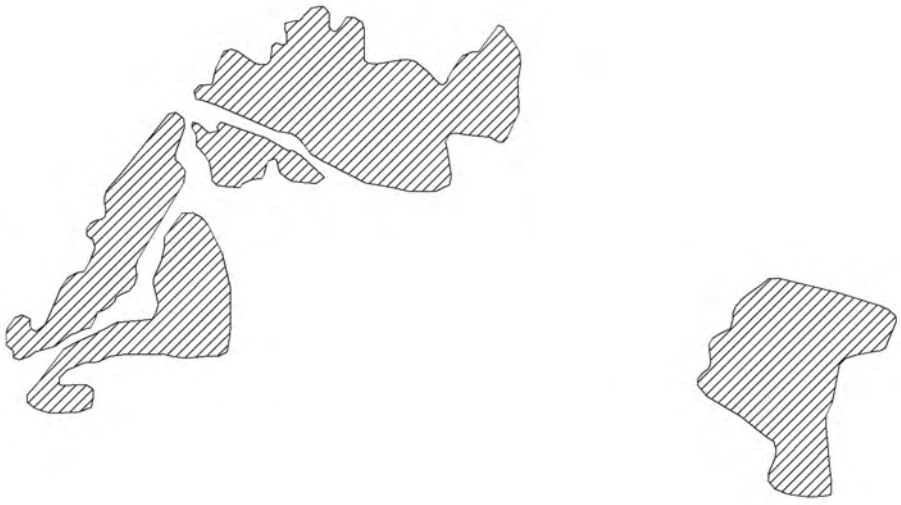
The site comprises five forest remnants located near the 179 m highpoint on Ruarangi Road. The forest remnants are within 1 km of the southernmost part of the Ruarangi



Q07/156 Ruarangi Road Forest Remnants 2







Road Forest Remnants (Q07/112) and the northernmost remnant is very close to the head of the Graham Road Riparian Forest Remnants (Q07/157). All remnants are grazed with a sparse understorey, except where the Ruarangi Road passes through the northernmost remnant. On the roadside where stock are excluded is an established understorey of mahoe, ponga, nikau, houhere, kohekohe, taraire, lancewood, mapou, supplejack, and *Melicytus micranthus*. Kohekohe were heavily possum-browsed, with some of the trees having few leaves remaining. Except for the

easternmost remnant, which has emergent kahikatea, tree size and the lack of emergent podocarps suggests that most of the remnants regenerated following human clearance.

(a) The northernmost western remnant comprises totara forest with occasional puriri, kahikatea, and nikau. The remnant on the northern side of the road is also totara forest, with frequent kahikatea and taraire, and occasional houhere, mahoe, mapou, rewarewa, nikau, kohekohe, *Metrosideros fulgens*, rimu, and *Melicytus micranthus*.

(b) The southernmost of the two western remnants is totara forest within which taraire is common, puriri is frequent, and nikau, karaka, and titoki are occasional.

(c) The easternmost remnant is in a south-facing gully head. Taraire and kahikatea are common, pukatea is frequent, and tawa, rewarewa, ponga, nikau, kohekohe, and totara are occasional. There is some dieback of taraire, particularly on the edges of the remnant.

Fauna

Not surveyed.

Significance

All of the remnants are grazed with a sparse understorey, and dieback is occurring on some of the edges. However, one of the remnants has mature, emergent kahikatea which are very uncommon in Waipu ED, therefore this site has been assigned to Level 2 significance. The northernmost remnant is contiguous with the Graham Road Riparian Forest Remnant (Q07/157).

GRAHAM ROAD RIPARIAN FOREST REMNANTS

Survey no.	Q07/157
Survey date	11 November 2006
Grid reference	Q07 259910 (6 remnants)
Area	16.3 ha
Altitude	100–140 m asl

Ecological units

(a) Totara forest in gully (55%)

(b) Totara–kanuka–mamaku forest in gully (45%)

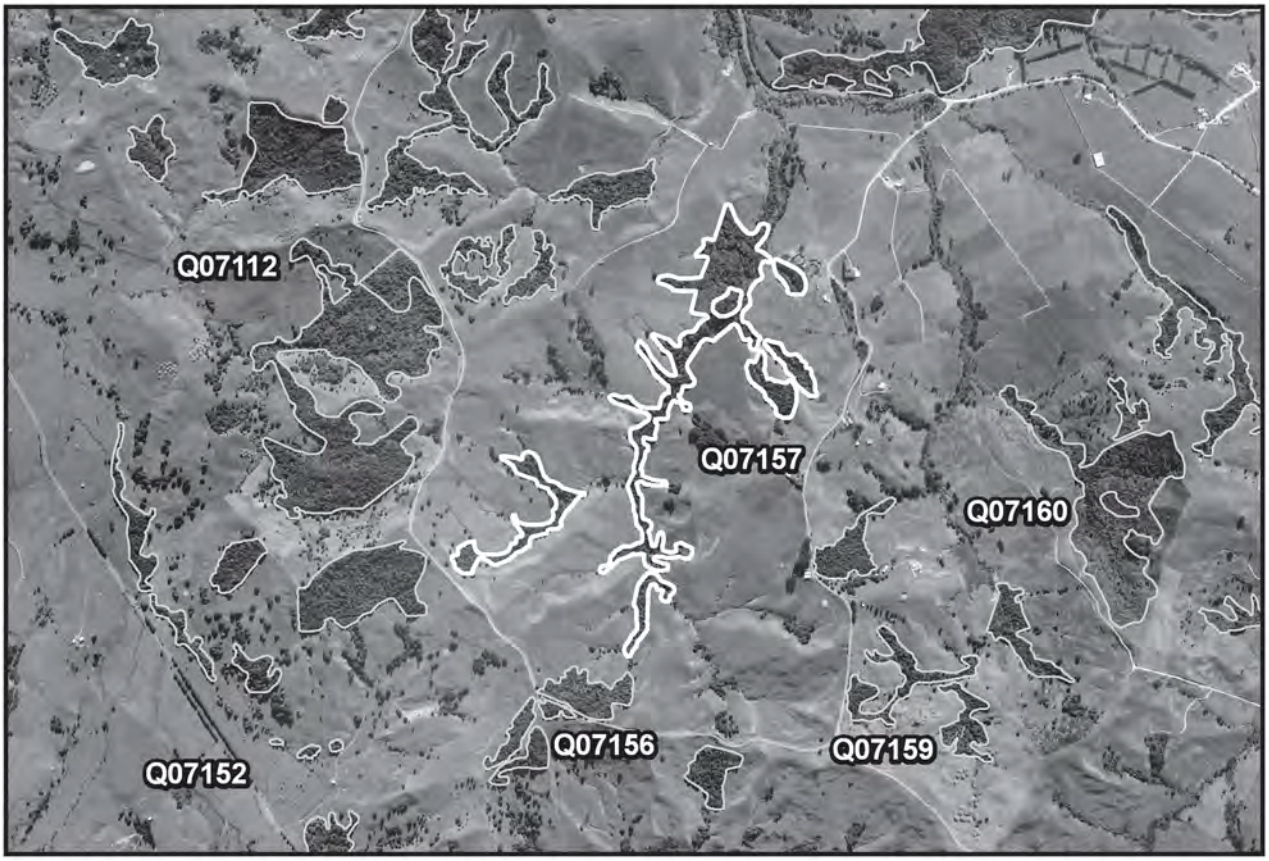
Landform/geology

Gullies underlain by Miocene sandy mudstone (Waitemata Group).

Vegetation

This site, which lies between Graham Road and Ruarangi Road, comprises a group of six forest remnants in a tributary of the upper Tauraroa River. The site is narrow in places, and runs for approximately 1.4 km alongside the stream, with 10–100 m sections of pasture between the remnants. Tongues of forest extend up into small adjacent gullies. The absence of mature, emergent podocarps suggests that the forest has regenerated following human clearance, and the entire remnant appears to be grazed.

(a) Totara forest is dominant in the upper part of the gully with occasional kanuka, kahikatea, mamaku, ponga, rewarewa, pukatea, taraire, puriri, and puka.



Q07/157 Graham Road Riparian Forest Remnants

0 500 1,000
Metres

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

(b) The lower (northern) end of the site is also dominated by totara, but is more diverse. Kanuka and mamaku are common, kahikatea is frequent, and rewarewa, pukatea, kauri, rimu, mahoe, radiata pine, crack willow, and black wattle are

occasional. Stands of macrocarpa within or adjacent to the remnant have been excluded from the site. The northern end of the site grades into a narrow band of crack willow-dominated vegetation that links to the Pokapu Hill Forest Remnant (Q07/114) and the Ruarangi Mangapai Forest Remnants (Q07/155).

Fauna

Australasian harrier was recorded during this survey.

Significance

All of the remnants are grazed and there are occasional radiata pine, crack willow, and black wattle. The remnants provide riparian protection to a tributary of the Tauraroa River, and are linked by crack willow alongside the tributary to Pokapu Hill Forest (Q07/114) and the Ruarangi Mangapai Forest Remnants (Q07/155).

GRAHAM ROAD FOREST REMNANTS

Survey no.	Q07/159
Survey date	11 November 2006
Grid reference	Q07 266903 (4 remnants)
Area	8.8 ha
Altitude	100–160 m asl

Ecological unit(s)

(a) Totara forest in gully head (100%)

Landform/geology

Gullies underlain by Miocene sandy mudstone (Waitemata Group).

Vegetation

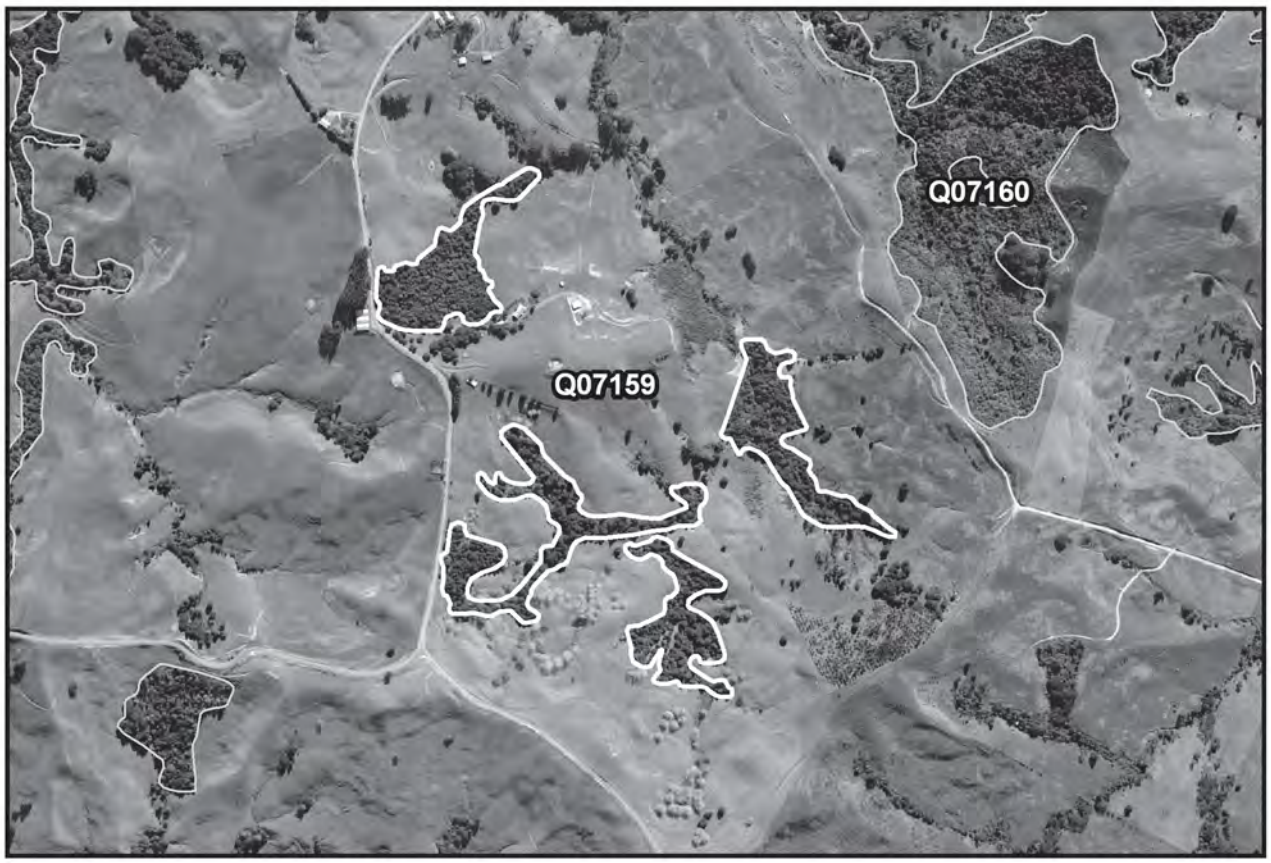
This site comprises four small remnants of totara forest (a) to the east of Graham Road. Kahikatea is common, and puriri, taraire, and rimu are occasional. The surrounding land is covered in pasture with occasional totara trees. The remnants are heavily grazed and have a sparse understorey.

Fauna

Shining cuckoo was recorded during this survey.

Significance

The remnants are grazed and have a sparse understorey. However, the site is linked by crack willow treeland to the Graham Road Riparian Forest Remnants (Q07/157), and Graham Road Forest and Shrubland (Q07/160) and may form part of a habitat network for mobile bird species such as kukupa.

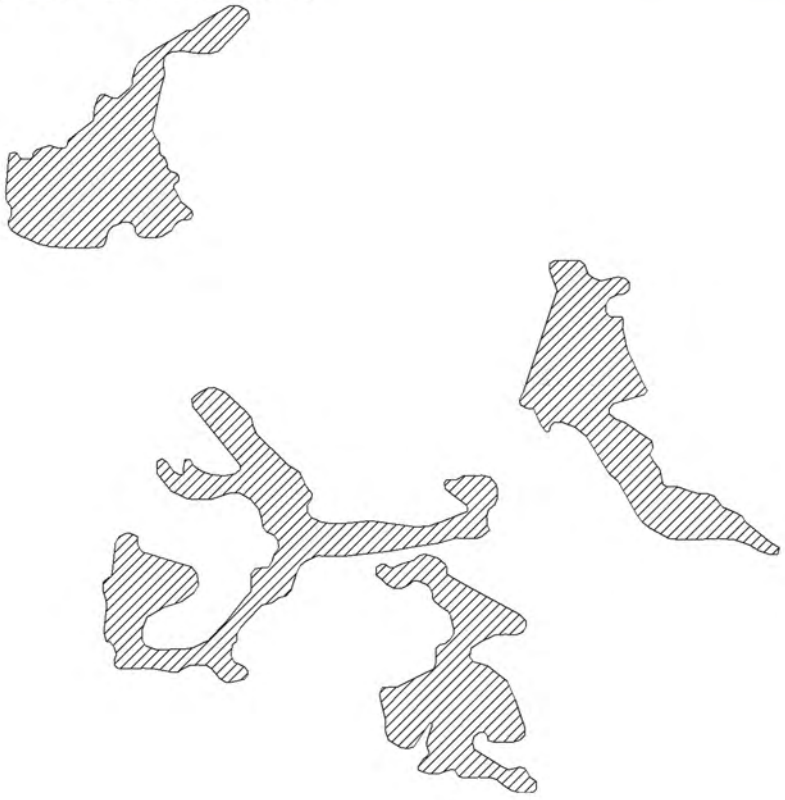


Q07/159 Graham Road Forest Remnants

0 250 500
Metres

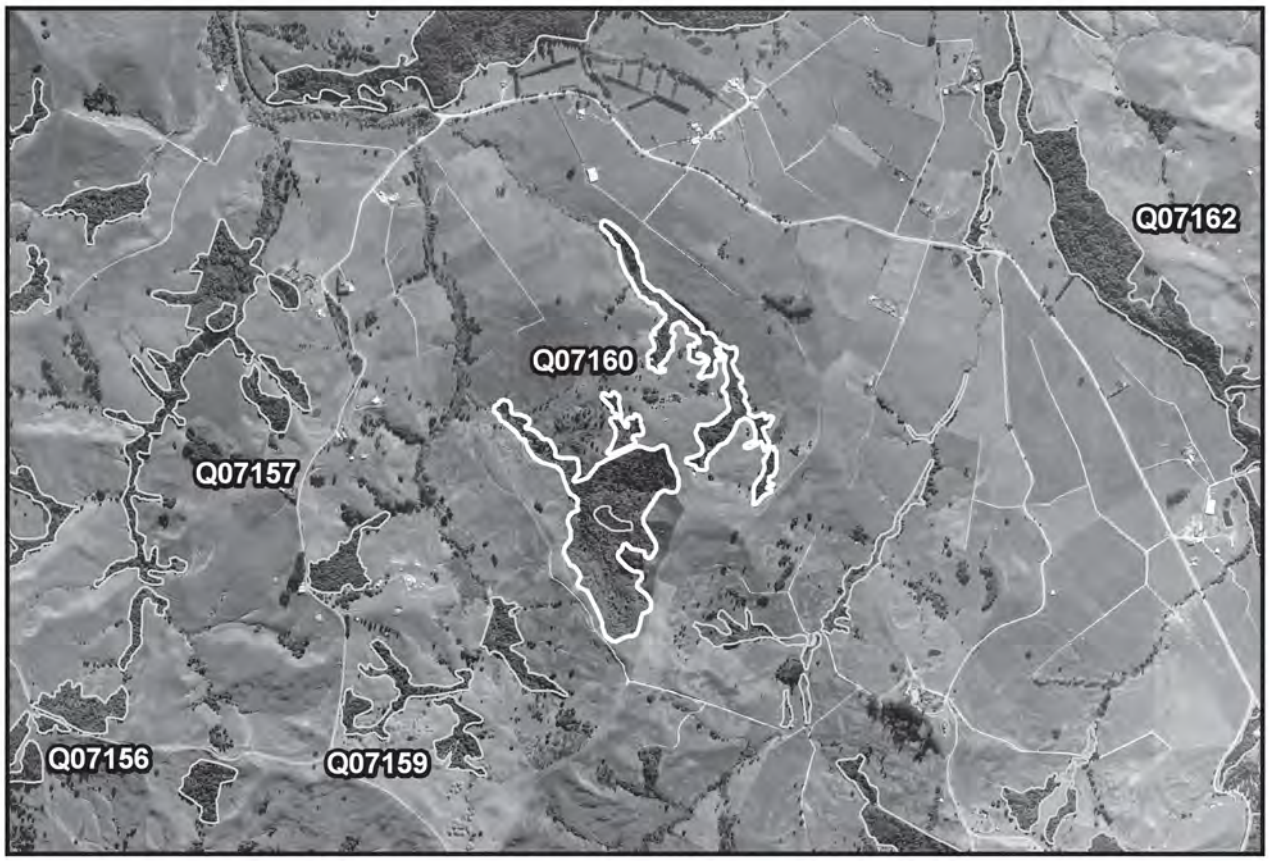
Habitat Type

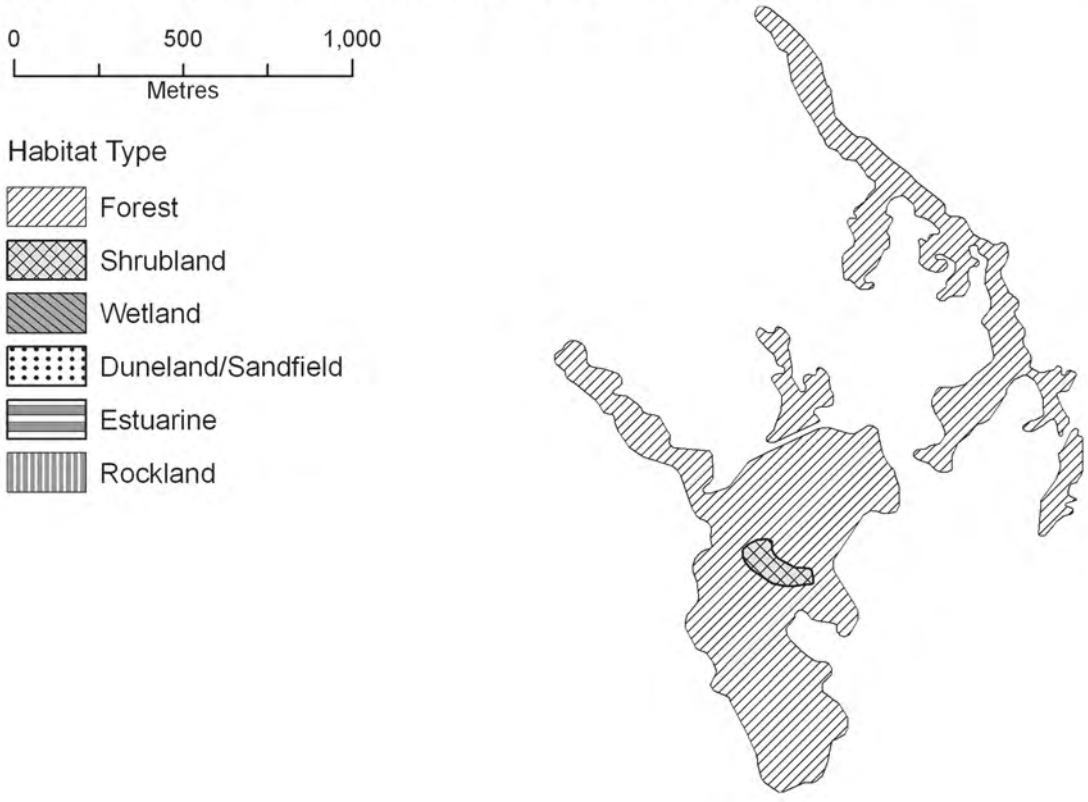
- Forest
- Shrubland
- Wetland
- Duneland/Sandfield
- Estuarine
- Rockland



GRAHAM ROAD FOREST AND SHRUBLAND

Survey no.	Q07/160
Survey date	11 November 2006
Grid reference	Q07 272909 (4 remnants)
Area	19.7 ha (19.3 ha forest, 0.4 ha shrubland)
Altitude	100–161 m asl





Ecological units

(a) Totara forest on moderate hillslope (72%)

(b) Kahikatea forest in gully head (15%)

(c) Totara–mamaku forest on moderate hillslope (8%)

(d) Manuka shrubland on moderate hillslope (5%)

Landform/geology

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

Vegetation

This site encompasses a group of forest remnants in a northwest facing gully. From the survey location, it was unclear if the site was fenced. The surrounding land is covered in pasture with scattered totara trees, a small radiata pine forest along the eastern edge of the remnant, and crack willow treeland in the gullies. The willows link the site with Pokapu Hill Forest (Q07/114) and other remnants to the north.

(a) The majority of the remnants are totara forest with frequent mamaku, towai and radiata pine, and occasional kanuka, taraire, nikau, and ti kouka.

(b) A gully head is dominated by kahikatea, with occasional taraire and ti kouka.

(c) On the northern and southwestern edges totara is abundant, mamaku is common, puriri and kanuka are frequent, and kahikatea, ti kouka, and mahoe are occasional.

(d) Scattered throughout are small areas of manuka shrubland with frequent totara and occasional mamaku and ponga.

Fauna

Not surveyed.

Significance

The largest remnant has a compact shape and covers the upper catchment of a stream that flows into the Tauraroa River. All of the remnants are probably grazed, and radiata pine occurs as a canopy emergent. The site is linked by exotic vegetation to larger forest remnants to the north, and may form part of a habitat network for mobile bird species such as kukupa.

MANGAPAI RIPARIAN FOREST REMNANTS

Survey no.	Q07/161
Survey date	13 November 2006
Grid reference	Q07 266936 (4 remnants)
Area	7.7 ha
Altitude	80–84 m asl

Ecological unit

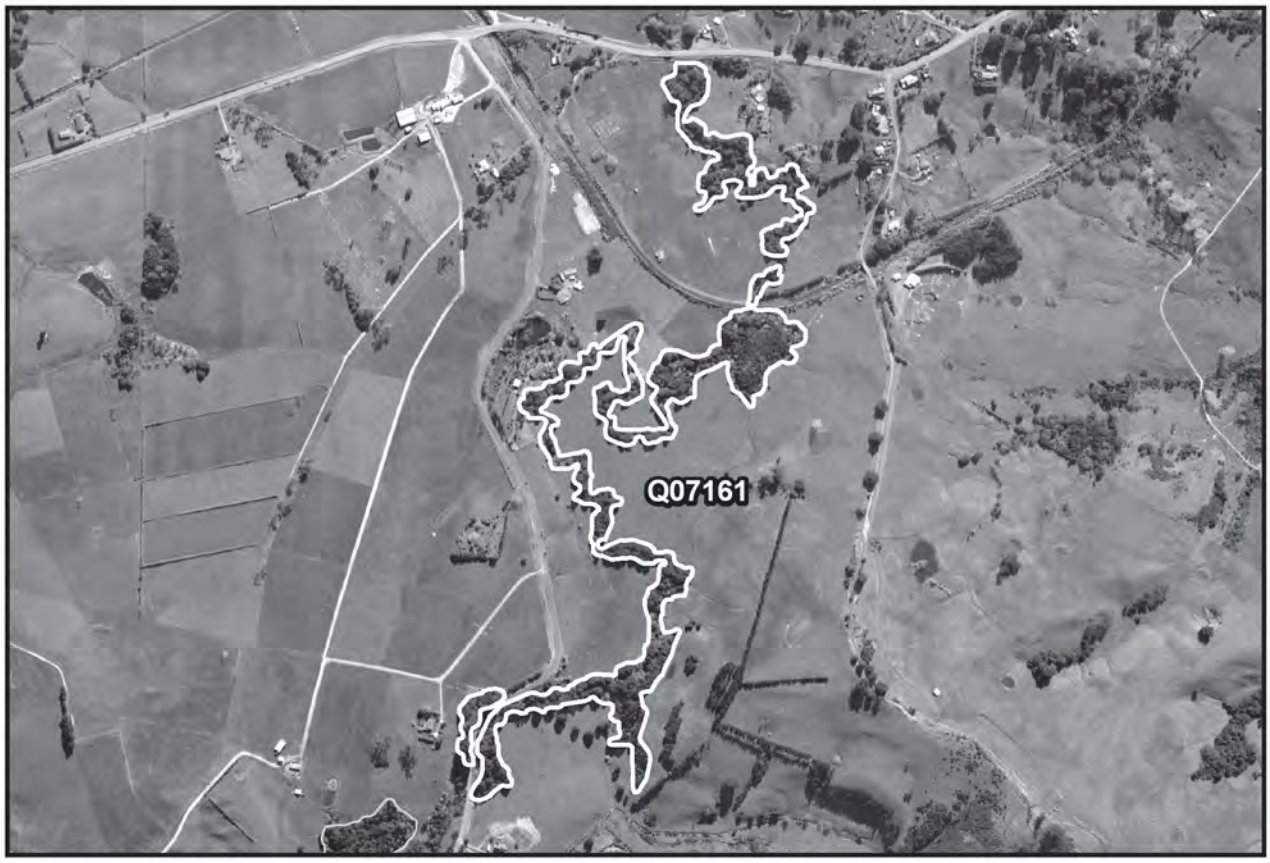
(a) Totara forest on alluvium (100%)

Landform/geology

River flats on Holocene alluvium.

Vegetation

This site comprises a narrow band of riparian forest growing alongside a tributary of the Tauraroa River. The site is approximately 1.1 km long, and at its maximum width, approximately 100 m wide. The surrounding land is primarily covered in pasture,



Q07/161 Mangapai Riparian Forest Remnants

0 250 500
Metres

Habitat Type

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

except for the northern end which is adjacent to the sports fields of Mangapai Domain Recreation Reserve, and at the southern end, where the remnant runs alongside Mangapai Caves Road. The remnants are totara forest (a) with frequent titoki and kanuka. A diverse range of species are occasionally present including kowhai, small-leaved milktree, ti kouka, karaka, mapou, harakeke, houhere, mahoe and ponga. Hawthorn, Japanese honeysuckle and crack willow are occasional, as are large, presumably planted, macrocarpa and eucalyptus. The only area from which stock are excluded is the southern end between the river and the road. At this location the understorey has a dense carpet of tradescantia, and small-leaved milktree is common in the subcanopy.

Fauna

Australasian harrier and pukeko were recorded during this survey.

Significance

Forest on alluvium is under-represented in Waipu ED, but this site is a Level 2 site because the remnants are grazed, and the understorey is sparse. The one exception is a small roadside area that has an established understorey, but there is a dense weed infestation of tradescantia. All of the remnants are narrow with strong edge effects. The vegetation provides riparian protection to a tributary of the Tauraroa River, and crack willow alongside this tributary links the site to forest remnants upstream (Q07/114, Q07/155). 0.4 ha is in a recreation reserve (DOC-administered) and 0.3 ha is in an esplanade reserve (WDC-administered) (together these comprise *c.*10% of the remnant).

MILL BROOK FOREST REMNANTS

Survey no.	Q07/165
Survey date	15 November 2006
Grid reference	Q07 369808 (3 remnants)
Area	34.2 ha
Altitude	20–100 m asl

Ecological unit

(a) Totara forest on alluvium (100%)

Landform/geology

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

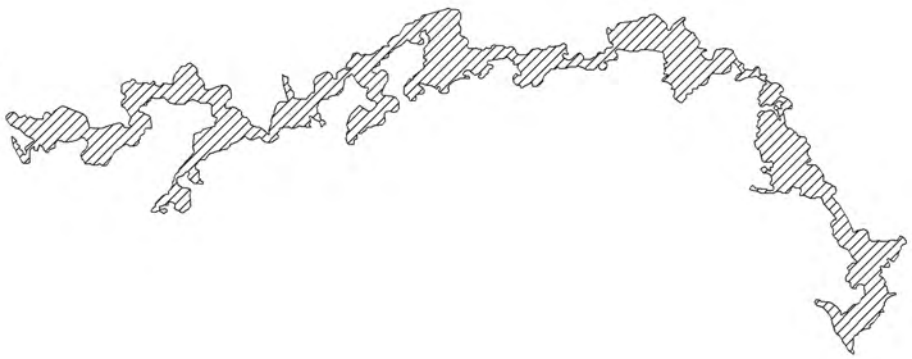
Vegetation

The Mill Brook forest remnants form a band of totara forest (a) that follows the course of Mill Brook for approximately 3 km upstream of Millbridge Road. Kanuka is frequent with occasional taraire, ti kouka, matai, manuka, puriri, kowhai, houhere, mapou, rimu, ponga, crack willow, and radiata pine. The absence of mature, emergent podocarps suggests that the remnants are entirely secondary. The surrounding land use is pastoral farming and the remnants, except for some of the road side edges, are grazed. Stock are excluded from one remnant between the river and the road at the corner of Mill Brook Road and Millbridge Road; at this location the edge of the forest is severely infested with tradescantia, Chinese privet, and garden

Q07/165 Mill Brook Forest Remnants

0 500 1,000
Metres

Habitat Type
Forest
Shrubland
Wetland
Duneland/Sandfield
Estuarine
Rockland



nasturtium. The remnants are approximately 700 m from the extensive Ahuroa Road Forest Remnants (Q08/224) and Mareretu Forest (Q08/220).

Fauna

Grey warbler, NZ kingfisher.

Significance

Alluvial forest is now severely reduced in extent in Waipu ED, and this site is the second largest area of totara forest on alluvium in the ED, but these remnants are grazed with a sparse understorey and localised infestations of weeds such as crack willow, radiata pine, Chinese privet, and tradescantia. 0.2 ha of the site is in an esplanade reserve (WDC-administered).

McLEOD ROAD FOREST REMNANTS

Survey no.	Q07/166
Survey date	Not surveyed
Grid reference	Q07 391841 (5 remnants)
Area	34.6 ha
Altitude	33–97 m asl

Ecological units

(a) Kanuka forest on moderate hillslope and ridge

(b) Kanuka–mamaku forest on moderate hillslope and in gully

(c) Totara forest on moderate hillslope

Landform/geology

Hillslopes and gullies underlain by Mesozoic greywacke (Waipapa Terrane).

Vegetation

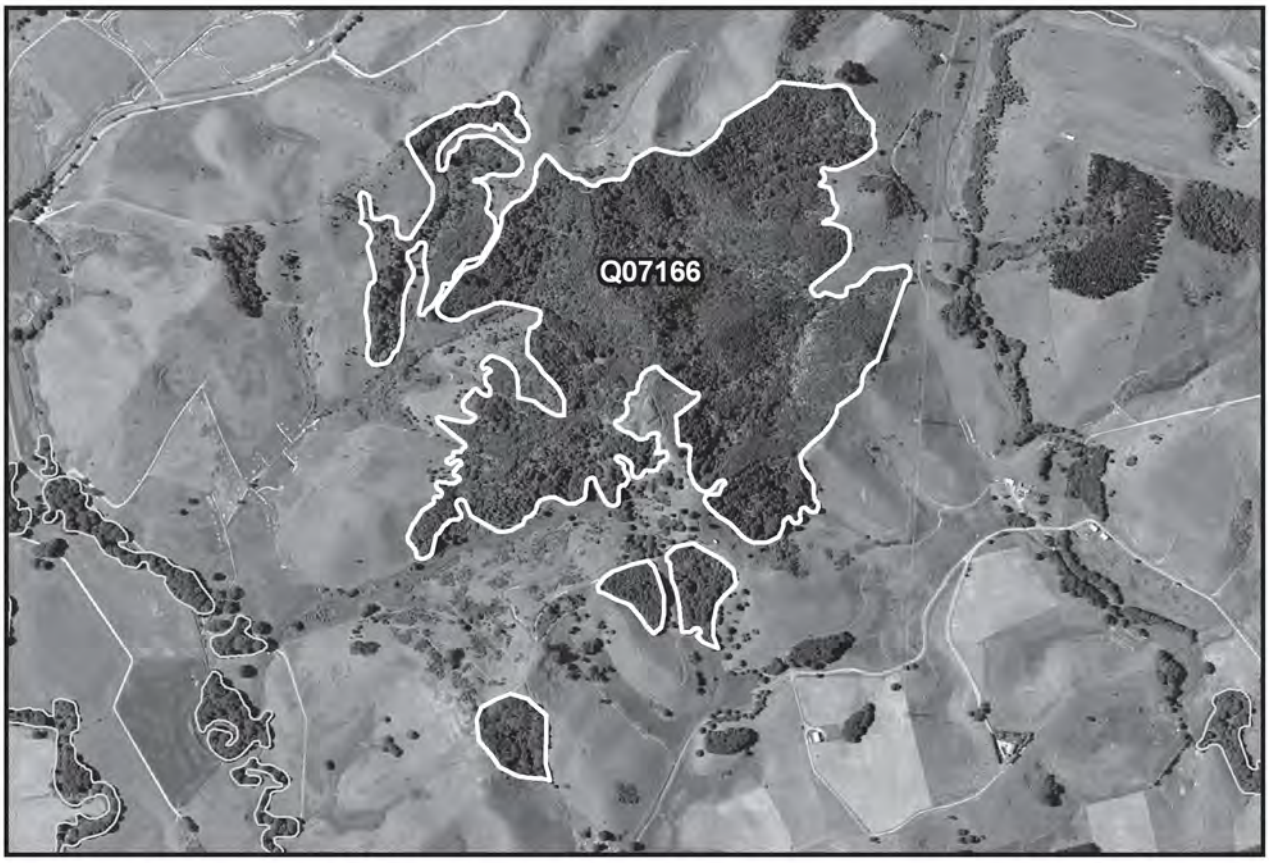
This site comprises secondary indigenous forest remnants centred on a 105 m asl peak to the south of Ruakaka Forest (Q07/121). It was not surveyed in the current study due to poor visibility and the vegetation types listed above have been estimated from aerial photography flown in January 2004. It appears that the main type is kanuka forest (a), with less common kanuka–mamaku forest (b) associated with gullies and shaded hillslopes. There also appear to be substantial areas of totara forest (c). In addition, broadleaved forest types such as taraire forest and puriri forest may be present. An area thought to be woolly nightshade scrub has been excluded.

Fauna

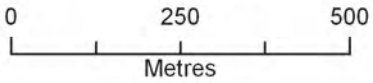
Not surveyed.

Significance

The site comprises one larger central remnant with several smaller remnants nearby. Larger examples of secondary forest occur on greywacke hillslopes and gullies in Waipu ED, and it is therefore unlikely that any of these ecological units are the best representative examples of their types. There is no information on fauna for this specific site. Topographic maps indicate two pa sites are present. Further information could lead to this site being upgraded to Level 1.

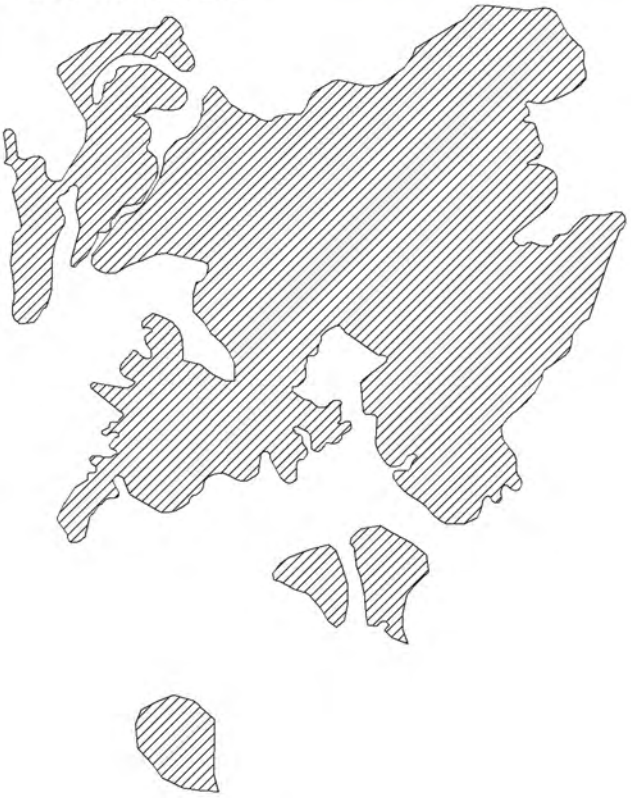


Q07/166 McLeod Road Forest Remnants



Habitat Type

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



TAKAHIWAI SALTMARSH AND SHRUBLAND

Survey no.	Q07/167
Survey date	26 March 2007
Grid reference	Q07 379958
Area	4.3 ha (1.7 ha shrubland, 2.6 ha estuary)
Altitude	0–2 m asl

Ecological unit(s)

(a) Brush wattle–manuka shrubland on alluvium (40%)

(b) Sea rush rushland in estuary (22%)

(c) Mudflat in estuary (21%)

(d) Glasswort herbfield in estuary (10%)

(e) Saltmarsh ribbonwood shrubland in estuary (5%)

(f) Mangrove shrubland in estuary (2%)

Landform/geology

Holocene estuarine intertidal muddy sediments, backed by a low terrace underlain by Late Pleistocene (last interglacial) sandy estuarine deposits.

Vegetation

Takahiwai Saltmarsh and Shrubland is a small area of estuarine vegetation with an adjoining shrubland on coastal alluvium. The western edge of the site is contiguous with an extensive area of mangroves, and the small, constructed tidal channels that extend eastwards into the site, are lined with mangrove shrubland (f) with occasional glasswort and saltmarsh ribbonwood. A complex mosaic of bare mudflat (c), sea rush rushland (b) with frequent mangrove and occasional oioi and *Austrostipa stipoides*, and glasswort herbfield (d) occurs between the mangroves and the saltmarsh ribbonwood shrubland (e) on the eastern terrestrial margin of the site. Brush wattle–manuka shrubland (a) with occasional willow, pampas, gorse, dally pine, and ti kouka occurs at the northern end of the site.

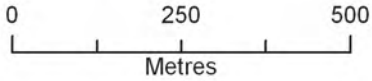
Fauna

Australasian harrier, mallard, and grey warbler were recorded during this survey.

Significance

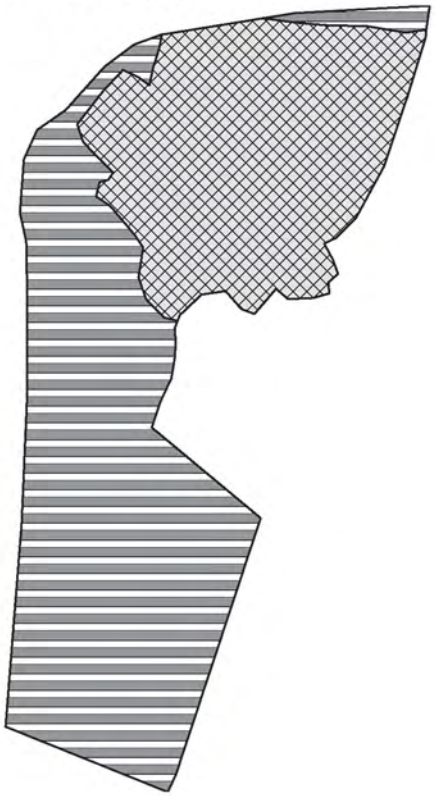
This site is small relative to other areas of estuarine vegetation and has been modified by drainage and weed invasion. However the site is contiguous with the extensive mangrove and saltmarsh areas along the Takahiwai shoreline of Whangarei Harbour, which has populations of banded rail (Sparse) and North Island fernbird (Sparse) (Wildland Consultants 2005), and these species may also be present here. Despite being modified, the site is an example of a vegetation sequence that was once much more extensive along the Takahiwai shoreline. Saltmarsh was probably formerly present as a nearly continuous band a between this site and Takahiwai Stream Estuary (Q07/143) to the east.

Q07/167 Takahiwai Saltmarsh and Shrubland



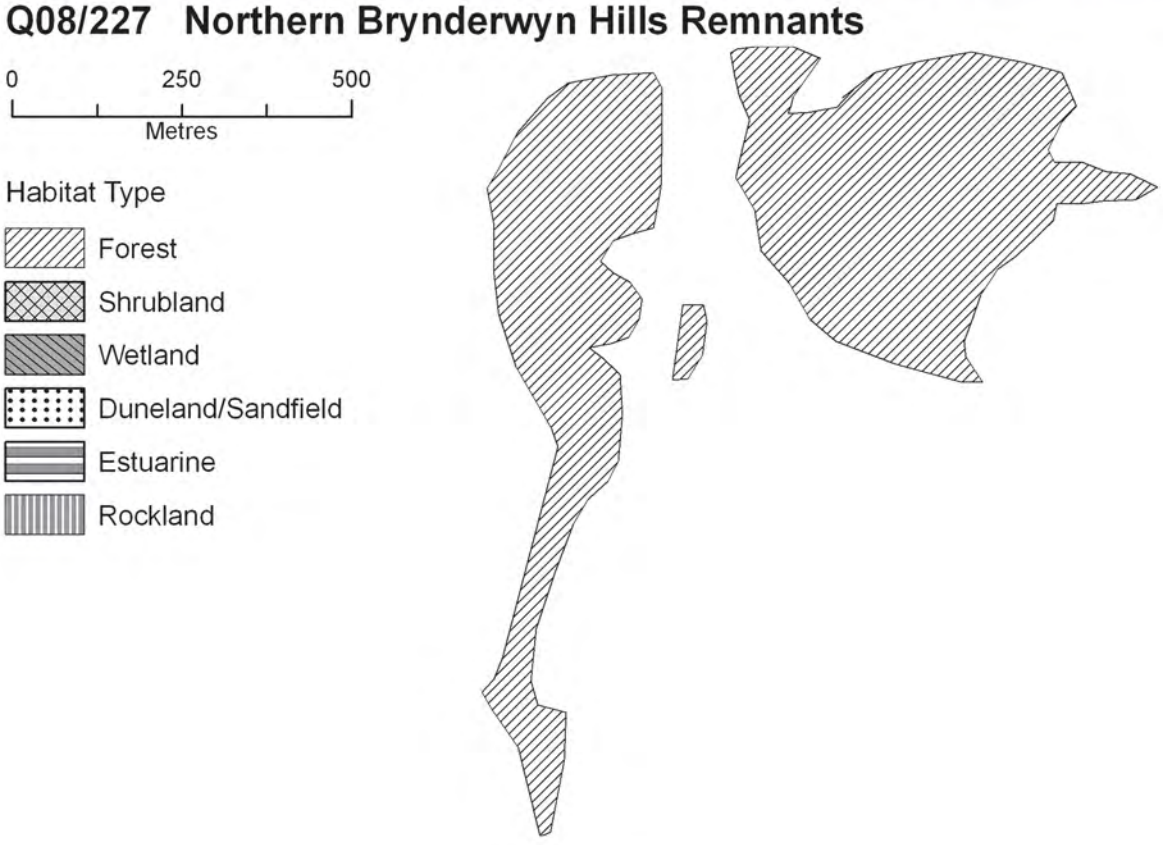
Habitat Type

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



NORTHERN BRYNDERWYN HILLS REMNANTS

Survey no.	Q08/227
Survey date	26 March 2007
Grid reference	Q08 384725 (3 remnants)
Area	3.1 ha
Altitude	60–80 m asl



Ecological unit(s)

(a) Kahikatea–rimu–totara treeland on moderate hillslope (65%)

(b) Rimu forest on moderate hillslope (30%)

(c) Kanuka forest on moderate hillslope (5%)

Landform/geology

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

Vegetation

This site comprises two small mixed forest and treeland remnants on the northern slopes of the Brynderwyn Hills. The remnants are bisected by State Highway 1, and lie between the Waipu Gorge Forest Remnants (Q08/222) and Durham Road Forest and Shrubland (Q08/237) to the west, and the Brynderwyn Hills Forest Complex – Part B (Q08/225b) to the east. The western remnant is mostly secondary rimu forest (b), with frequent kanuka and kahikatea, and occasional tanekaha, rewarewa, totara, ti kouka, mapou, and kauri. A narrow area of kanuka forest (c) with occasional rimu, mapou, ponga and gorse extends southwards alongside the road, and this is the only part of the site from which stock are excluded. The two remnants on the eastern side of the road comprise kahikatea–rimu–totara treeland (a) with frequent kanuka and occasional ti kouka, kauri, and gorse. All of the remnants are very degraded, with large canopy gaps and weed infestations. With the exception of the roadsides, the remnants have a sparse understorey due to grazing by stock.

Fauna

Not surveyed.

Significance

These remnants are degraded examples of forest types which are relatively common on hillslopes within Waipu ED. Better quality examples of similar vegetation occur on either side of the site, within the Waipu Gorge Forest Remnants (Q08/222), Brynderwyn Hills Forest Complex (Q08/225) and Durham Road Forest and Shrubland (Q08/237). The remnants have a sparse understorey and their condition is declining due to heavy grazing and weed infestation, but they may provide a habitat stepping stone between the neighbouring Level 1 natural areas on the northern Brynderwyn Hills.

BRAIGH FOREST REMNANTS

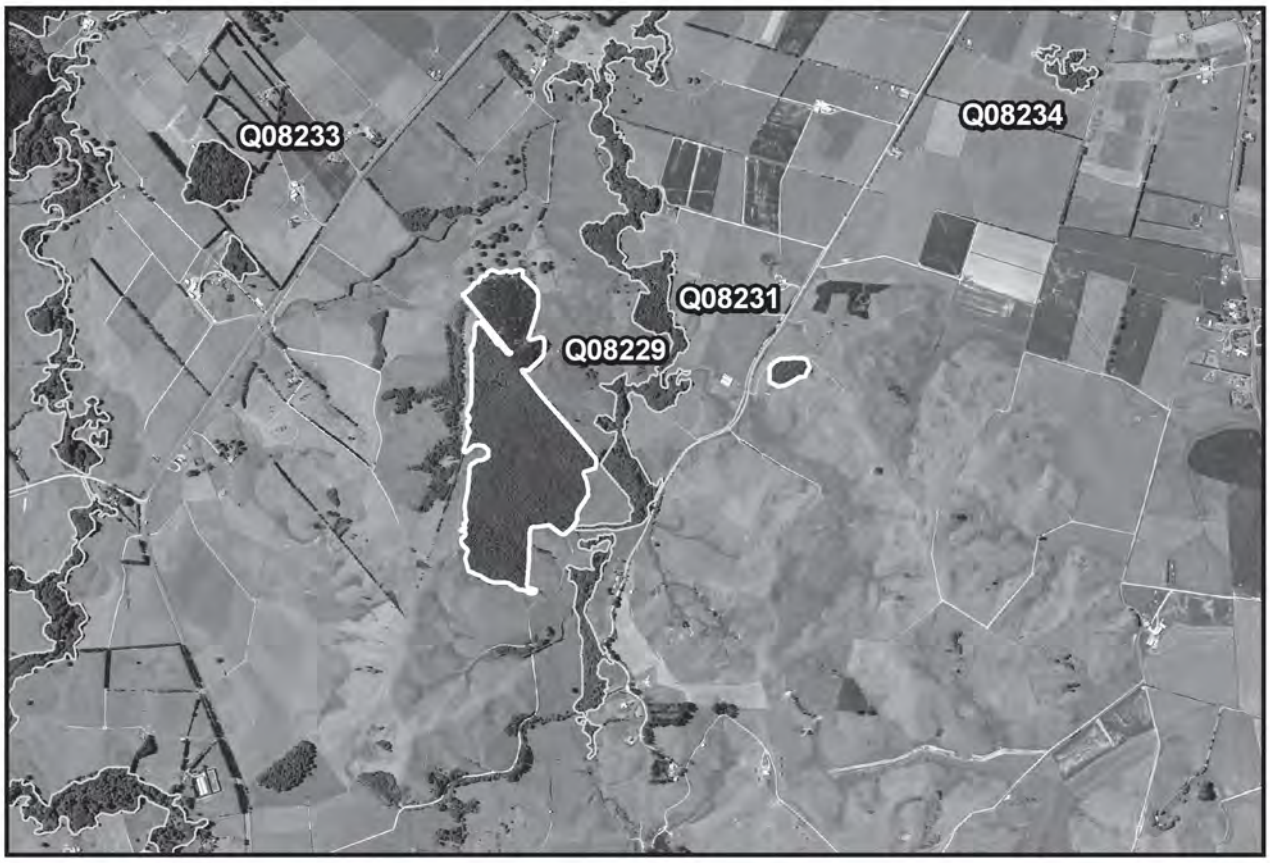
Survey no.	Q08/229
Survey date	15 November 2006
Grid reference	Q08 392768 (2 remnants)
Area	21.9 ha
Altitude	17–60 m asl

Ecological unit(s)

(a) Kanuka forest on gentle hillslope (100%)

Landform/geology

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



Q08/229 Braigh Forest Remnants

Vegetation

This site comprises two remnants of (a) kanuka forest near the southern end of St Mary's Road. The site is entirely secondary, and is the largest area of indigenous forest in the lower Waihoihoi River catchment. Kanuka is abundant, with frequent totara and tanekaha. Occasional species include kauri, rimu, kahikatea and manuka. The small remnant to the east of St Mary's Road is included in this site because its vegetation type and landform is similar to the larger remnant.

Fauna

Not surveyed.

Significance

These remnants, which are entirely secondary and probably grazed, comprise the largest area of indigenous forest in the lower Waihoihoi River catchment. The largest remnant is almost contiguous with the Waihoihoi River Forest Remnants (Q08/231) and there is likely to be significant movement of forest birds between these two sites.

ARGYLL STREET FOREST REMNANTS

Survey no.	Q08/234
Survey date	15 November 2006
Grid reference	Q08 408779 (2 remnants)
Area	1.2 ha
Altitude	12–13 m asl

Ecological unit(s)

(a) Kahikatea forest on alluvium (100%)

Landform/geology

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

Vegetation

This site comprises two small and isolated remnants of kahikatea forest (a) on the alluvial plain to the south of Waipu township. The forest is dominated by kahikatea that probably regenerated following human clearance. One puriri and one karaka are present on the northern edge, and tree privet and Chinese privet occur on the edge of the remnants, and in the understorey. The remnants have been fenced recently, possibly to exclude cattle. The nearest areas of indigenous forest to the site are the narrow ribbons of forest alongside the Waihoihoi River and Waionehu Stream, approximately 1.1 km to the west and east, respectively.

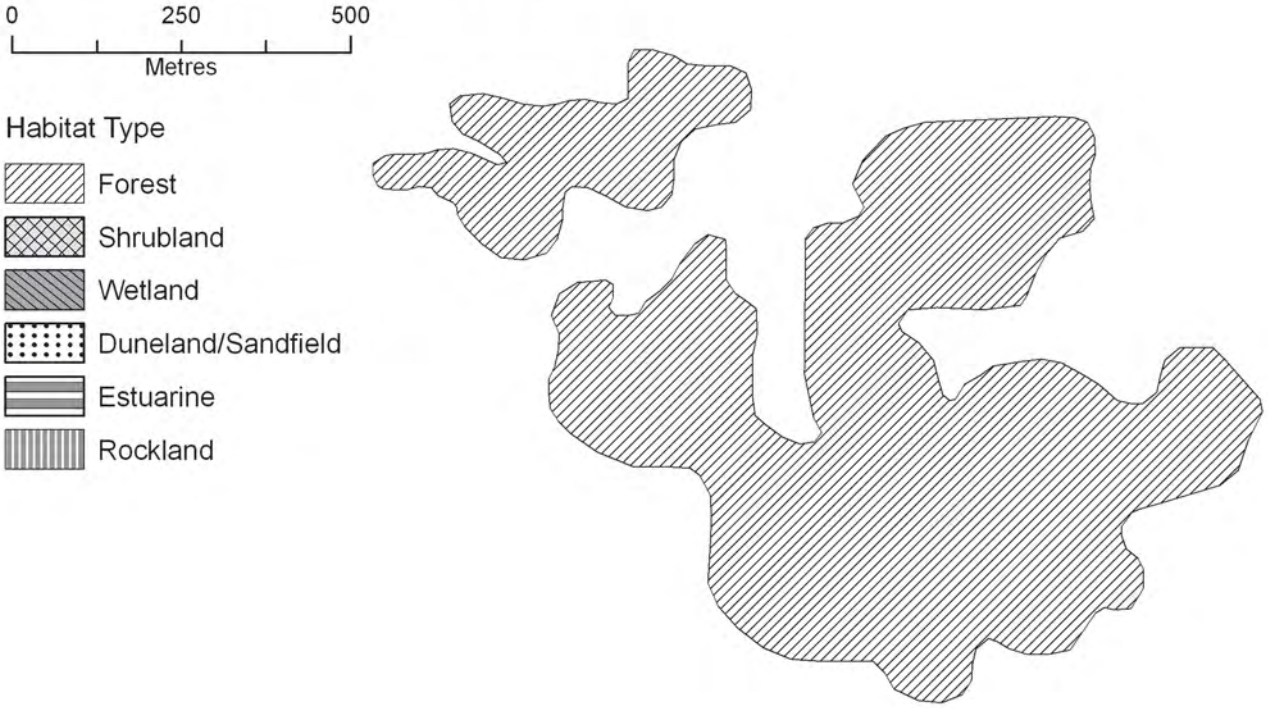
Fauna

Not surveyed.

Significance

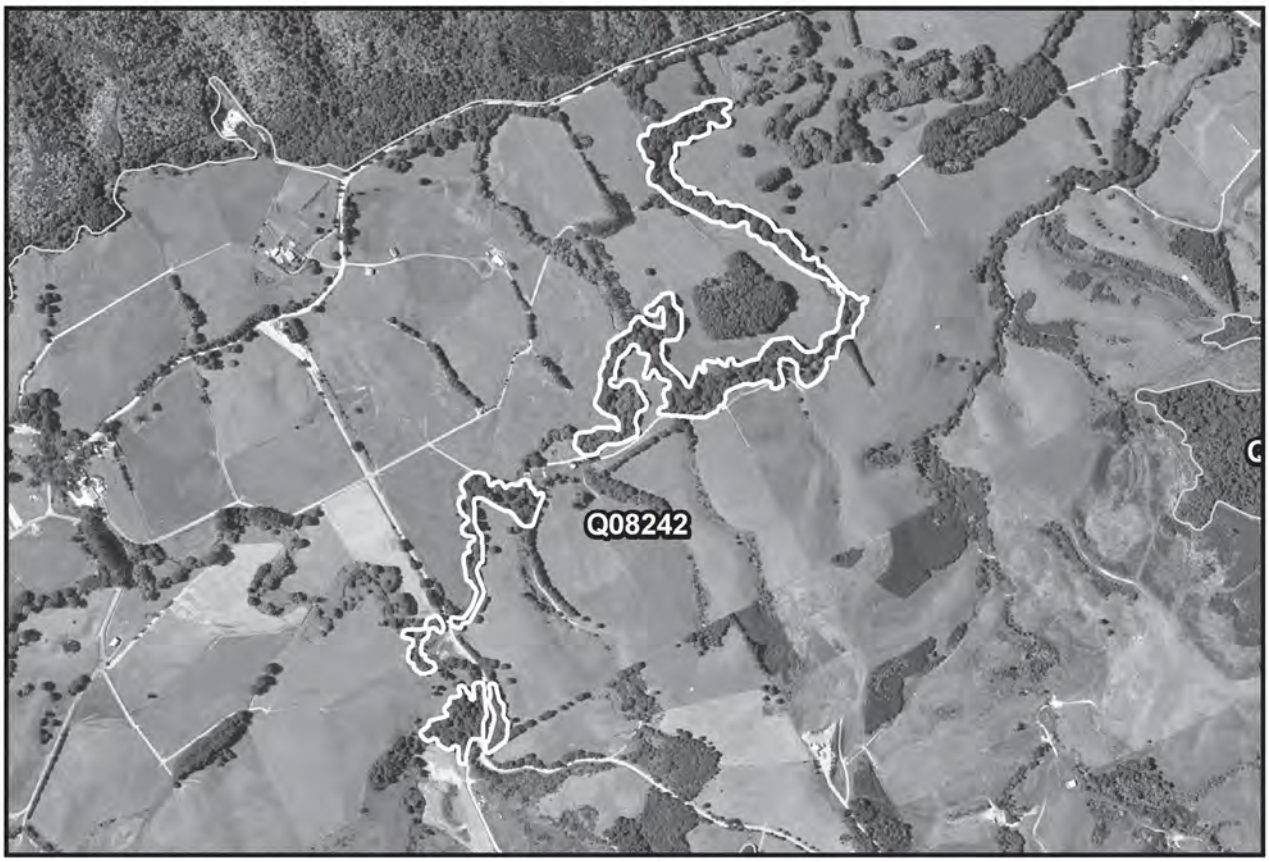
Forests on alluvium are now severely reduced in extent in Waipu ED, but the remnants in this site are small, isolated, have an understorey dominated by Chinese privet, and are either grazed or have been recently fenced to exclude stock. This site is therefore of Level 2 significance.

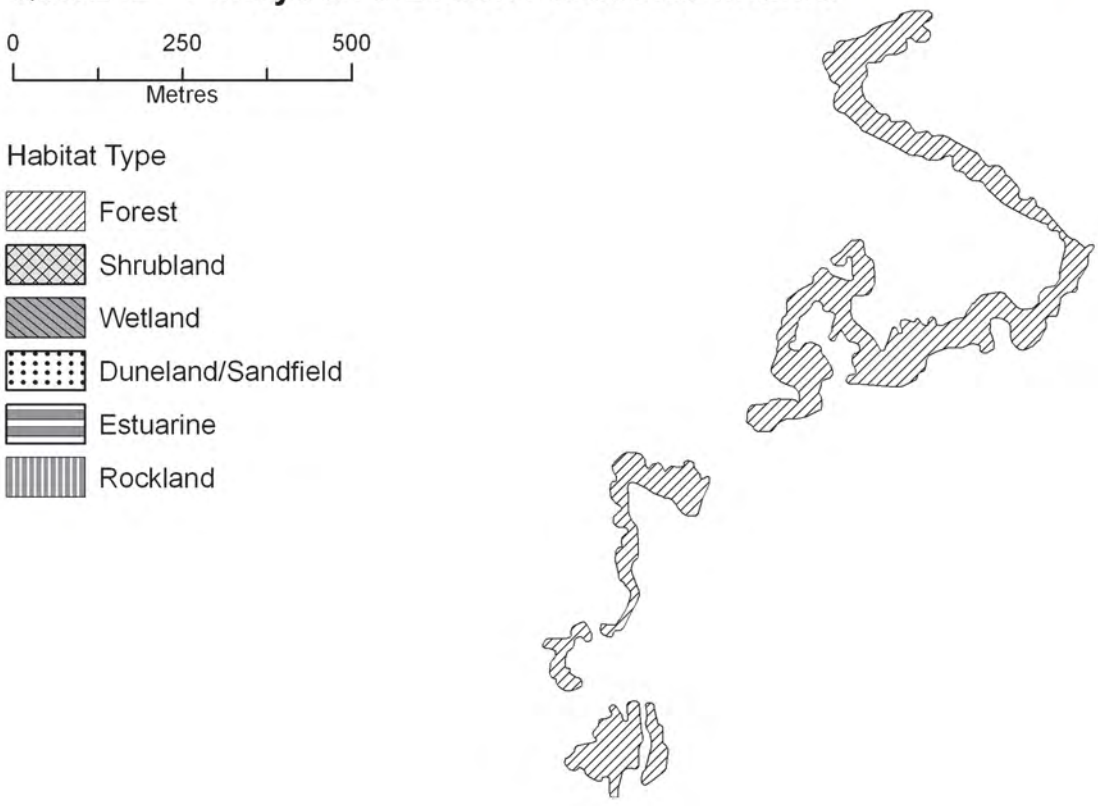
Q08/234 Argyll Street Forest Remnants



FINLAYSON'S BROOK FOREST REMNANTS

Survey no.	Q08/242
Survey date	15 November 2006
Grid reference	Q08 349749 (5 remnants)
Area	6.0 ha
Altitude	40–60 m asl





Ecological unit(s)
(a) Totara forest on alluvium (100%)

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

Vegetation
This site comprises a group of small riparian forest remnants in the Finlayson's Brook catchment. The surrounding land use is largely pastoral farming but exotic and indigenous treeland links the remnants, both upstream and downstream, to Mareretu Forest (Q08/220). The remnants are totara forest (a) with frequent kahikatea, and occasional rimu, kanuka, mahoe, ponga, matai, titoki, crack willow, and woolly nightshade. The absence of emergent podocarps suggests the remnants are entirely secondary. All the remnants appear to be grazed and have a sparse understorey, except for tradescantia that forms a dense groundcover in places.

Fauna
Not surveyed.

Significance
Forests on alluvium are now severely reduced in extent in Waipu ED, but these remnants are small, grazed, and infested with crack willow, tradescantia, and woolly nightshade, and this site is of Level 2 significance. They provide riparian protection for a part of Finlayson's Brook, and are linked by scattered trees to Mareretu Forest (Q08/220).

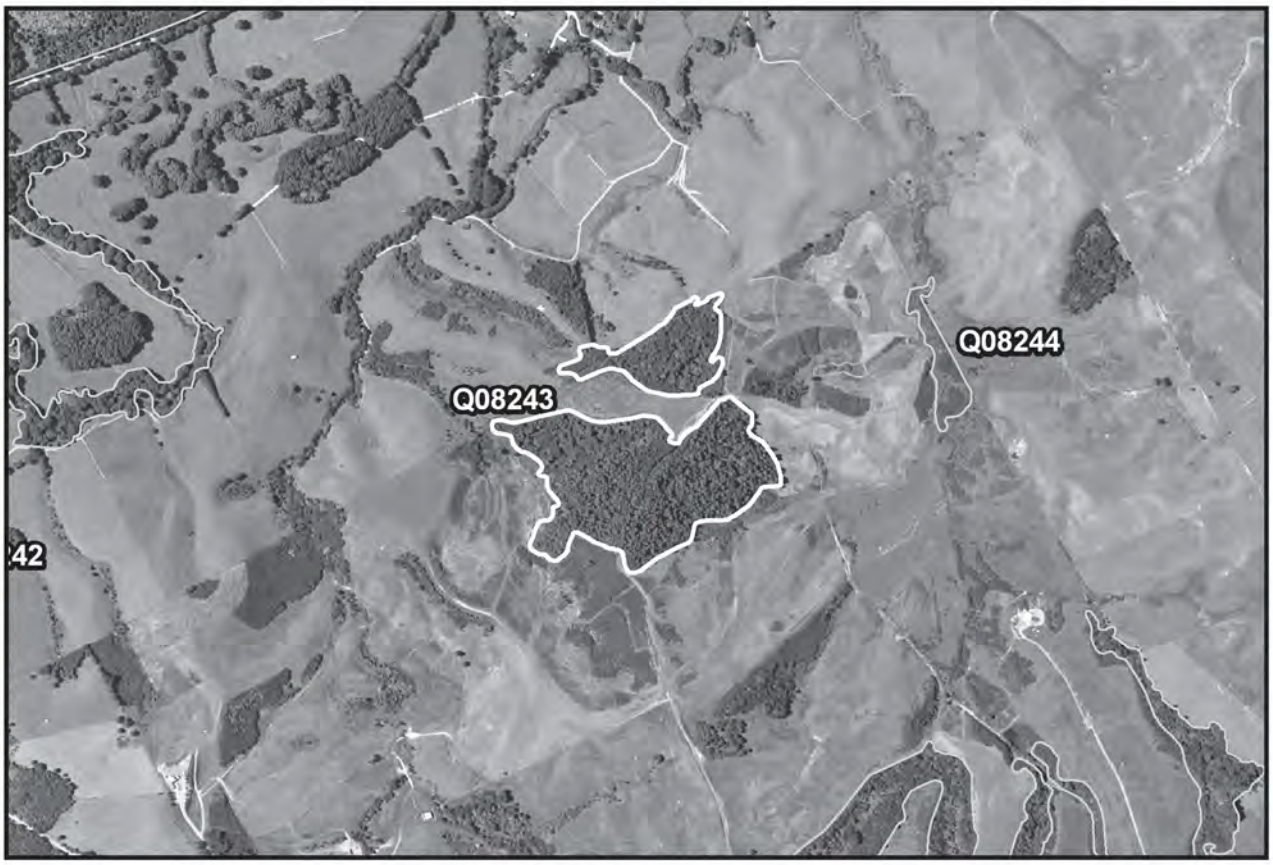
BROOKS ROAD FOREST REMNANTS

Survey no.	Q08/243
Survey date	15 November 2006
Grid reference	Q08 358749 (2 remnants)
Area	7.9 ha
Altitude	43–80 m asl

Ecological unit(s)
(a) Kauri–kanuka–rimu forest (100%)

Landform/geology
Hillslopes underlain by Miocene sandstone and mudstone (Waitemata Group).

Vegetation
This site comprises two small remnants of kauri–kanuka–rimu forest (a) in the Finlayson's Brook catchment. The two remnants are separated by a thin band of pasture *c.* 50 m wide at its narrowest point, and the surrounding land is covered in either grazed pasture or gorse scrub. Kauri, kanuka and rimu are common, with kanuka more dominant on the edges of the remnant. Kahikatea and tanekaha are frequent, with occasional mamaku, puriri, towai, and manuka. The absence of mature kauri and podocarps suggests that both the remnants are secondary, but the largest kauri are now beginning to develop round-headed crowns. The remnants are probably grazed.

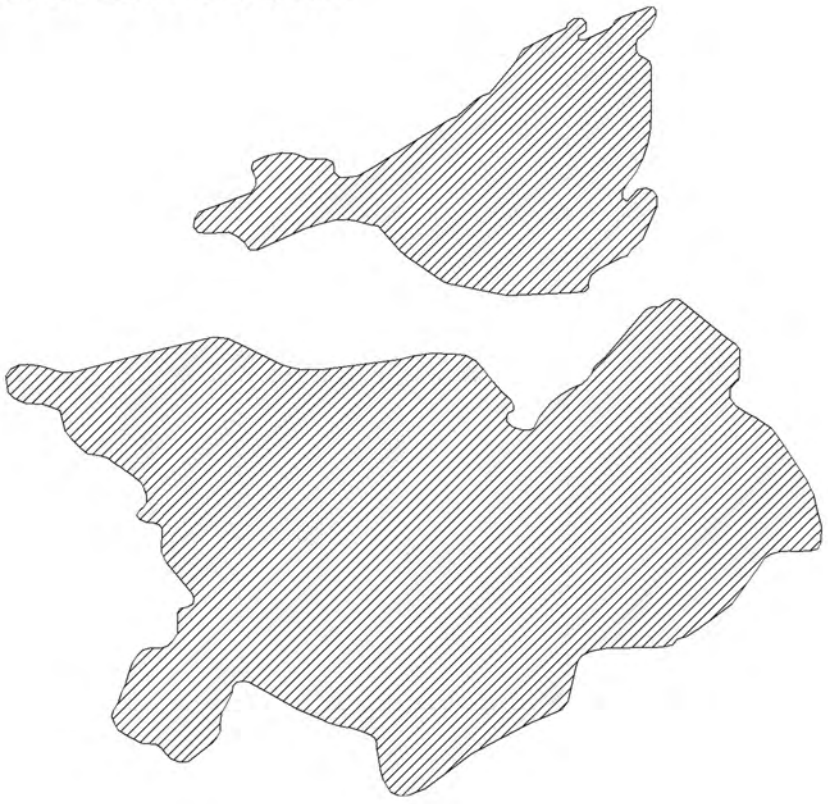


Q08/243 Brooks Road Forest Remnants

0 250 500
Metres

Habitat Type

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



Fauna

Not surveyed.

Significance

The site has a healthy canopy but is probably grazed with a sparse understorey. The remnants are centrally located in the midst of the pastoral landscape that separates Mareretu Forest (Q08/220), from the extensive forest remnants in the south of Waipu ED. Therefore the remnants may form part of a habitat network for mobile bird species such as kukupa.

MILLBROOK DAM AND FOREST REMNANTS

Survey no.	Q08/245
Survey date	12 November 2006
Grid reference	Q08 284799
Area	26.6 ha (13.2 ha forest, 13.4 ha wetland)
Altitude	60–102 m asl

Ecological units

(a) Open water (constructed lake) (50%)

(b) Totara forest on moderate hillslope (30%)

(c) Totara treeland on moderate hillslope (10%)

(d) Rimu forest on moderate hillslope (10%)

Landform/geology

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

Vegetation

On the northern side of Millbrook Road there is a *c.* 800 m long by 200 m wide lake which has been created by damming a tributary of the Mangawai River. There are also two contiguous indigenous forest remnants. The valley in which the dam is situated appears to have been flooded within the last few decades, as there are still standing dead trees in the water at the eastern end. Apart from these, the dam is entirely open water (a) with no visible aquatic vegetation (the water appears somewhat turbid). Grazed pasture borders the entire southern margin and part of the northern margin. The largest forest remnant is on a south-facing slope on the northeastern shore. It comprises totara forest (b) with frequent kahikatea and taraire, and occasional rewarewa, matai, pukatea, nikau, rimu, pate, kohuhu, tawa, and kanuka. At the western end of this remnant the forest thins out to totara treeland (c) with occasional mamaku, kanuka, and kahikatea, probably as a result of grazing pressure. The small forest remnant on the western shore includes a stand of totara forest and a stand of rimu forest (d) with occasional kauri and totara, but this remnant is not clearly visible from any publicly accessible vantage point.

Fauna

Grey warbler.

Significance

This dam is a substantial size for Waipu ED (second largest included in this study), and is bordered by some moderately-sized remnants of indigenous forest which may act as

Q08/245 Millbrook Dam and Forest Remnants

0 250 500
Metres

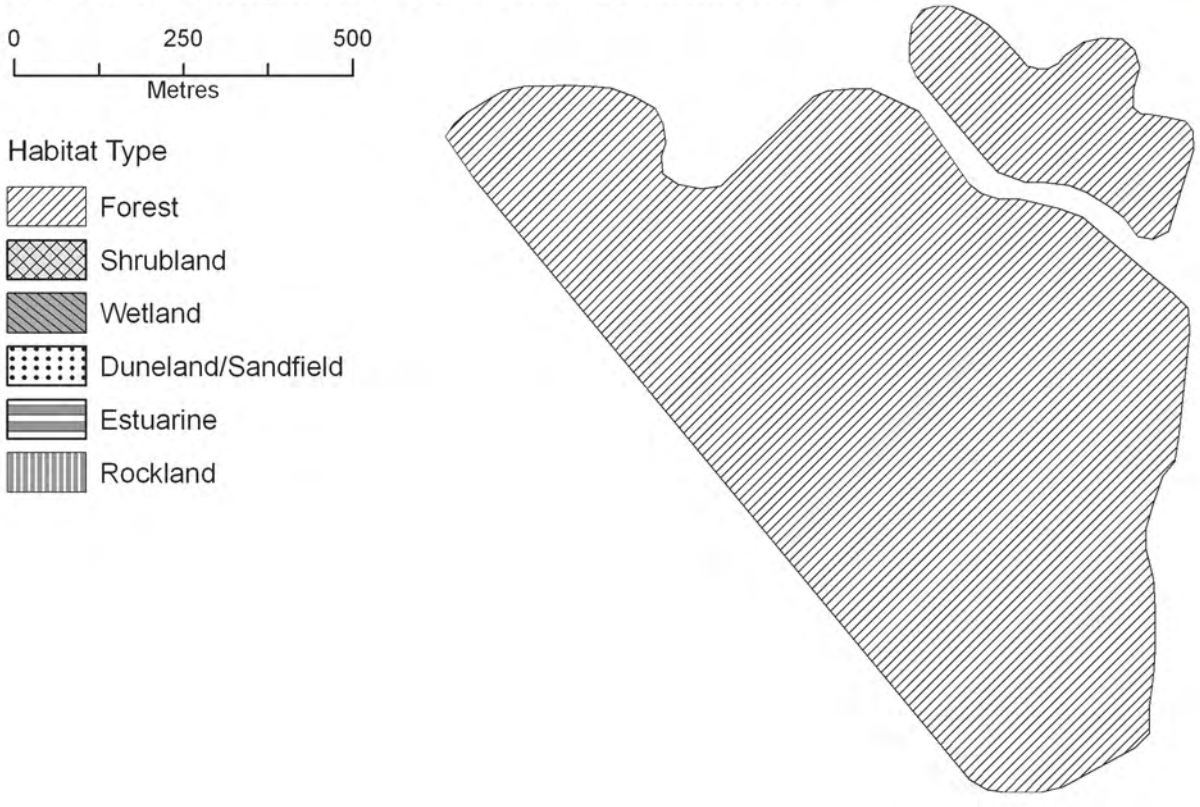
Habitat Type

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

refuges for water birds using the open water habitat, although little information is known about wildlife use. None of the ecological units present are considered to be the representative examples of their types. Additional survey is recommended to determine the full ecological significance of this site.

SHOEMAKER ROAD FOREST REMNANT 1

Survey no.	Q08/246
Survey date	15 November 2006
Grid reference	Q08 399796 (2 remnants)
Area	1.1 ha
Altitude	15–17 m asl



Ecological unit(s)
(a) Totara forest on alluvium (100%)

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

Vegetation
This site comprises two small remnants of totara forest (a) adjacent to Shoemaker Road. The remnants have been incorporated into the garden associated with the house on the eastern edge. The canopy of the remnants is almost entirely dominated by totara trees (up to *c.* 1 m diameter), and is intact except for one large fishtail palm. The understorey has been severely modified and is now either ornamental gardens or mown lawn. Plants cultivated within the remnant include bromeliads, windmill palm, camellia, Brazilian plume *Philodendron* sp., *Draceana draco*, *Macrozamia communis*, and clivia. Invasive plants within the remnant include tuber ladder fern, velvet groundsel, Kahili ginger, palm grass and fairy crassula. Indigenous plants cultivated in the garden are often not native to the ecological district, such as Poor Knights lily, king fern, *Pseudopanax laetus*, and parapara. Surviving remnants of the natural understorey include karaka, mapou, ponga, totara, and pigeonwood. The hydrology of the remnants has also been altered, with a drain *c.* 1 m deep through the centre of the site.

Fauna
Kukupa (Gradual Decline) and North Island fantail reported by the landowner (2006).

Significance
This site is a heavily modified example of alluvial vegetation, of which very little remains in Waipu ED. The understorey is either mown lawns or exotic gardens, and the hydrology of the remnant has been altered through drainage. Although kukupa (a threatened bird species) has been reported from here, this site is unlikely to be an important habitat for this species, and does not warrant Level 1 significance because it has been so heavily modified.