



Natural areas of Hokianga Ecological District

Reconnaissance Survey Report for the
Protected Natural Areas Programme

2004



Department of Conservation
Te Papa Atawhai

Natural areas of Hokianga Ecological District

Reconnaissance Survey Report for the Protected Natural
Areas Programme

NEW ZEALAND PROTECTED NATURAL AREAS PROGRAMME

Linda Conning, Wendy Holland and Nigel Miller

Published by
Department of Conservation
Northland Conservancy
P.O. Box 842
Whangarei, New Zealand

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Cataloguing-in-Publication data

Conning, Linda

Natural areas of Hokianga Ecological District : reconnaissance survey report for the Protected Natural Areas Programme / Linda Conning, Wendy Holland and Nigel Miller. Whangarei, N.Z. : Dept. of Conservation, Northland Conservancy, 2004.

1 v. : maps ; 30 cm.

ISBN 0-478-22518-0

ISSN 0112-9252

(New Zealand Protected Natural Areas Programme (Series))

1. Ecological surveys—New Zealand—Northland Region 2. Hokianga Ecological District (N.Z.)

Foreword

This report describes the significant natural areas of the Hokianga Ecological District as surveyed between 1994 and 1995.

Northland contains 18 mainland Ecological Districts, each characterised by its own landscape type and ecological makeup. The most distinctive feature of the Hokianga Ecological District is the Hokianga Harbour, New Zealand's fourth largest harbour. Originally a large drowned valley, the harbour is long and narrow, surrounded by dense mangrove forest containing some of the largest saltmarsh areas left in Northland. The Herekino and Whangape Harbours, forest and shrubland sequences and the dunelands of Hokianga North Head, also characterise the District. A unique geological feature is the Runaruna mud volcano, Northland's only mud volcano and a nationally significant geological and landform site.

As with most of Northland, extensive areas of habitat have been cleared and modified since human settlement. The Hokianga Ecological District survey has shown that habitats such as freshwater wetlands and swamp forest are now very rare. Since 1995 habitat loss has continued, further compromising the ecological wealth of the District.

The Protected Natural Area Programme (PNAP) provides a significant tool to the Department of Conservation, local bodies, resource management planners, iwi, landowners, interest groups and the public at large to help conserve what remains in the Hokianga Ecological District.

Providing this information is the focus of this programme and guides us to cherish the remaining natural areas and work together in their protection and enhancement. This is the challenge.

A handwritten signature in black ink, appearing to be 'Chris Jenkins', with a stylized, flowing script.

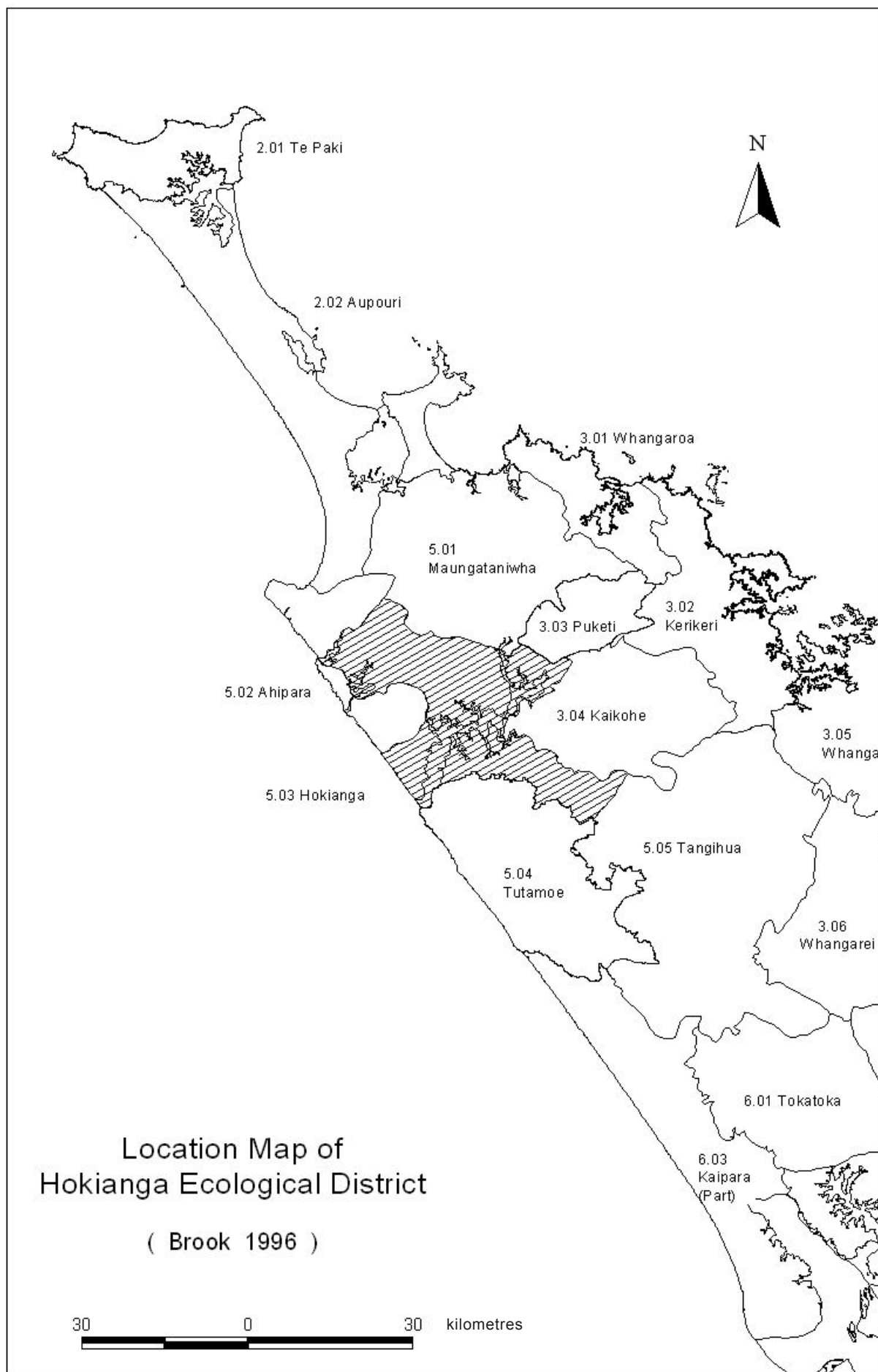
Chris Jenkins

Conservator Northland

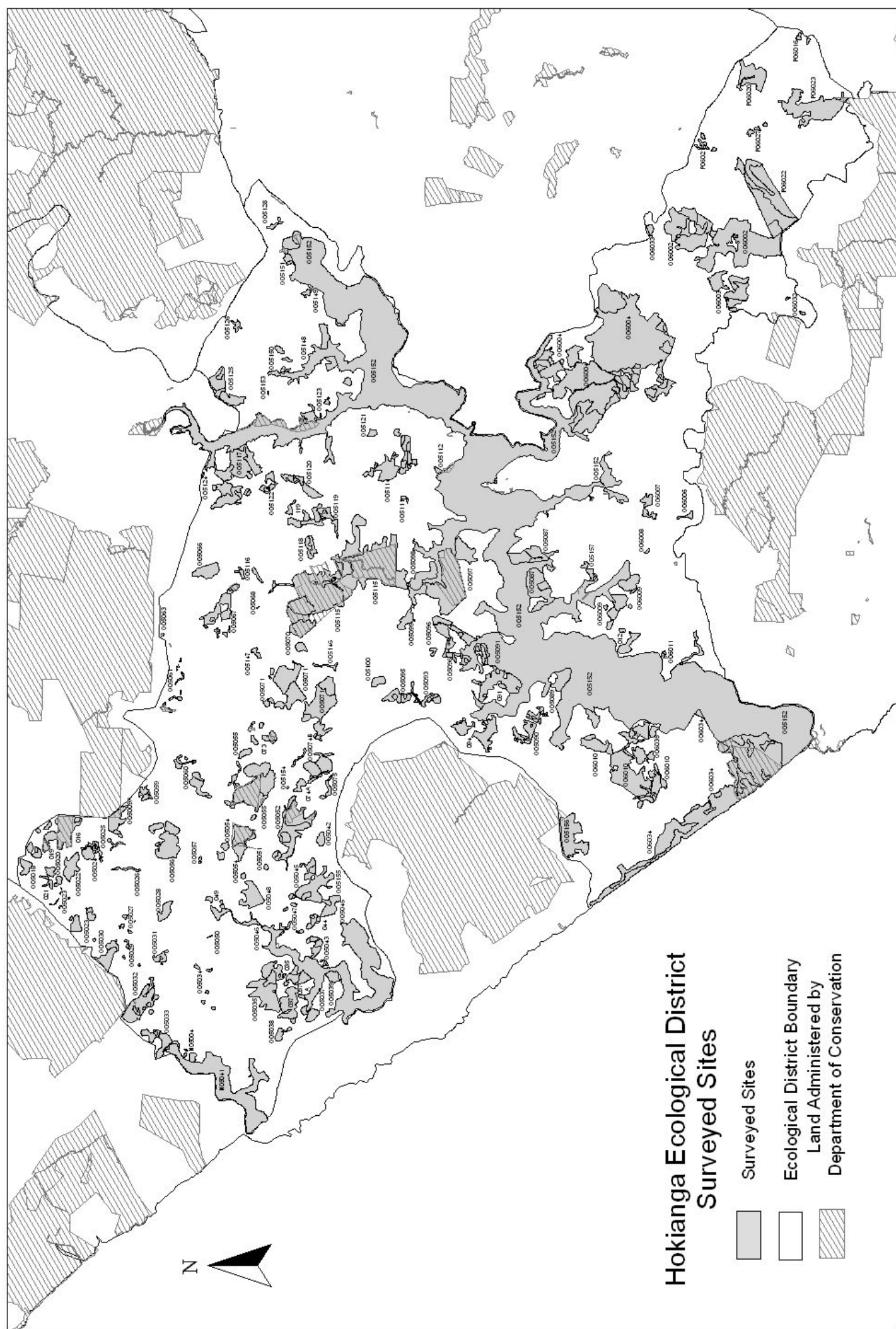
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Map 1. Location map of Hokianga Ecological District.



Abstract

The Hokianga Ecological District is centred on the Hokianga Harbour on the west coast of Northland, c. 60 km south of Kaitia and north of the Waipoua-Waima-Mataraua large forest tract.

Natural areas of ecological significance were identified from a reconnaissance survey undertaken in 1994/95 together with information from existing databases and information systems.

Hokianga contains some large areas of forest and extensive areas of regeneration. The harbours, in particular the saltmarsh and mangrove areas which grade into freshwater wetlands, forest and shrubland sequences, and rare vegetation types such as dunelands, provide the District with its distinctiveness. Broadleaf forest and kanuka/manuka shrubland are the most common vegetation types.

A total of 125 natural areas of ecological significance were identified. Of these, 93 are considered to be of regional or national importance. In many cases the values of the remaining areas could not be fully assessed in this reconnaissance survey.

Much of the former biodiversity of the Hokianga Ecological District has been lost. The physical and legal protection of identified priority areas for protection would safeguard the remaining biodiversity of the District.

1. Introduction

1.1 THE PROTECTED NATURAL AREAS PROGRAMME

The Protected Natural Areas Programme (PNAP) was established in 1982 to implement s3 (b) of the Reserves Act 1977:

Ensuring, as far as possible, the survival of all indigenous species of flora and fauna, both rare and commonplace, in their natural communities and habitats, and the preservation of representative examples of all classes of natural ecosystems and landscape which in the aggregate originally gave New Zealand its own recognisable character.

The goal of the programme is:

To identify and protect representative examples of the full range of indigenous biological and landscape features in New Zealand, and thus maintain the distinctive New Zealand character of the country. (Technical Advisory Group 1986)

The specific aim of the PNAP is to identify by a process of field survey and evaluation, natural areas of ecological significance throughout New Zealand which are not well represented in existing protected natural areas, and to retain the greatest possible diversity of landform and vegetation patterns consistent with what was originally present. To achieve this, representative biological and landscape features that are common or extensive within an ecological district are considered for protection, as well as those features which are special or unique.

As knowledge and information about the presence and distribution of fauna and flora such as invertebrates and bryophytes is limited, the protection of the full range of habitat types is important for maintaining the diversity of lesser known species.

This report differs from PNAP reports in other parts of New Zealand in that it is based mainly on a reconnaissance survey and existing published and unpublished information and data, and includes descriptions of most natural areas within the Ecological District boundaries.

The natural areas described have been evaluated and classified according to two levels of significance based on specified criteria (see Section 2), and are not confined to recommended areas for protection (RAPs), as defined in most PNAP reports.

This approach was adopted so that the survey report better meets the broader information requirements of the Department of Conservation arising from the Resource Management Act 1991 (RMA), the Convention on Biological Diversity (1992), and the more recent New Zealand Biodiversity Strategy (2000).

The Purpose and Principles of the RMA are set out in Part II of that Act and include:

- safeguarding the life-supporting capacity of air, water, soil and ecosystems;
- the preservation of natural character of the coastal environment, wetlands and lakes and rivers and their margins;
- the protection of outstanding natural features and landscapes;
- the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna;
- intrinsic values of ecosystems;
- maintenance and enhancement of the quality of the environment.

The Convention on Biological Diversity (1992), under the auspices of the United Nations Environment Programme, has promoted the concepts of biodiversity and ecosystems.

These concepts are reflected in this report by the number of sites, their size, and the emphasis on buffers and linkages in the identification and assessment of sites.

1.2 ECOLOGICAL REGIONS AND DISTRICTS

New Zealand's physical environment is very diverse and this is reflected in the diversity of indigenous plant and animal communities. In recognition of the biogeographic differences between various parts of New Zealand, a

classification of Ecological Regions and Districts has been established (McEwen 1987).

An Ecological District is a local part of New Zealand where the topographical, geological, climatic, soil and biological features, including the broad cultural pattern, produce a characteristic landscape and range of biological communities. Ecological Districts are grouped together into a series of Ecological Regions on the basis of shared general ecological and geological characteristics. In some cases, a single very distinctive Ecological District is given the status of Ecological Region to emphasise its uniqueness (Technical Advisory Group 1986).

The New Zealand Biological Resources Centre co-ordinated the mapping of the country into more than 260 Districts in 1982. Ecological Regions and Districts in northern New Zealand have recently been redefined to more accurately classify ecological variation within the Northland and Auckland areas (Brook 1996).

The PNAP uses the division of Ecological Districts as a framework throughout the country for determining ecological significance, including representativeness.

1.3 CONTENTS OF THIS REPORT

This report presents the findings of the reconnaissance phase of the PNAP survey of the Hokianga Ecological District. It includes maps and brief descriptions of most of the indigenous natural areas within the Ecological District, together with an analysis of the main vegetation types and information on threatened species and other taxa (i.e. species and subspecies) of scientific interest, including information which has become available since the time of survey.

The survey was undertaken in 1994 and 1995, but since then some sites have been partially or completely destroyed, others have regenerated. As it has not been possible to re-survey or re-map any altered boundaries, the maps and descriptions apply to the sites as of the date of survey, which may differ from their current configuration.

Soil sites of international, national or regional significance are derived from Arand et al. (1993) (only one site occurs within this Ecological District, Tapuwae Forest & Outliers O05/115). Important geological sites and landforms within the Northland Region of international, national and regional significance are derived from Kenny & Hayward (1996) (two sites occur within this Ecological District, Runaruna Mud Volcano O05/154 and Hokianga North Head O06/034). See Appendix 8.4 for ranking criteria.

1.4 HOKIANGA ECOLOGICAL DISTRICT

The Hokianga Ecological District covers approximately 86,000 ha encompassing the Hokianga Harbour, Whangape and Herekino Harbours and surrounding lands. North of the harbour the boundary follows the inland edge

of the Warawara Range, taking in the coastal dune system of Hokianga North Head to Pawarenga, then follows the inland edge of the Warawara Range, and east of the coastal hills between the Whangape and Herekino Harbours. It borders the southern boundary of Herekino Forest to just south of Diggers Valley before skirting southwest of the Maungataniwha Range through Broadwood, Mangamuka and Umawera to the hill country of Rangiahua in the east. South of the Hokianga Harbour, the eastern boundary follows the Punakitere-Waima River system as far south as Three Bridges then turns west to follow the northern edge of the Waima/Mataraua Range to rejoin the harbour at Pakanae.

Hokianga adjoins six other Ecological Districts at some point: Ahipara to the northwest, Maungataniwha to the north, Puketi in the northeast, Kaikohe to the southeast, Tangihua in the far southeast, and Tutamoe to the southwest.

Of the natural areas identified, 29.5% are forest, 19% shrubland, 3% duneland, 48.6% wetlands including harbours, 0.9% excluding harbours. The total area of sites recorded in this report is 26,100 ha (including harbours), or 13,629 ha (excluding harbours).

Significant natural features in the District of particular note are:

- The large west coast harbour systems of Hokianga, Whangape and Herekino, which account for approximately 14.5% of the entire Ecological District. The Hokianga Harbour, which is the fourth largest harbour in New Zealand, and habitat for a large number of indigenous species, some of which are threatened, is especially significant.
- Possibly the rarest habitat types are the low-lying swamp forest/swamp shrubland habitats which have suffered the most from past drainage and reclamation. Since the survey began, one of the few remaining areas of this type of coastal marginal zone was partly destroyed at Rangiahua. The harbours hold some of the last remaining examples of these inherently uncommon associations which, even now, are in the process of vanishing forever.
- A 2130 hectare forest to the north of the Waima Range (Classens/Duddys Bush) is the largest contiguous area of forest in this Ecological District, performing upper catchment and water quality protection and providing habitat for threatened species such as NI brown kiwi and regionally significant plants like ongaonga or stinging nettle (*Urtica incisa*).
- Tapuwae Forest and its outliers (1174 ha) form the second largest forest remnants found within this Ecological District and contain one of the best examples of unmodified old-growth forest in Northland remaining outside of the large forest tracts.
- A strong coastal influence is evident at sites such as Motuti and Te Karaka Point Coastal Forest where pohutukawa, karaka, nikau and kowhai appear as canopy species and some uncommon coastal plants are found in the understorey.
- A raupo-dominated freshwater wetland at Lower Waihou is one of the few examples of this ecosystem type left within this Ecological District. It is a good representative example of a rare and threatened habitat as well as supporting large numbers of the nationally threatened bird, spotless crane.
- NI brown kiwi are found throughout the Ecological District, in most of the larger habitats, as well as many of the remnant forests and shrublands.

2. Methodology

2.1 GENERAL APPROACH

To obtain information on the composition, extent and ecological values of indigenous natural areas within the northern sector of the Northland Conservancy, reconnaissance surveys using rapid semi-quantitative methods were carried out in 12 Ecological Districts between 1994 and 1996, and have been ongoing since in southern Northland.

Field work was carried out mainly by three Department of Conservation staff and co-ordinated in the Whangarei Office of the Northland Conservancy. This survey was part of that larger study.

Natural areas were identified from topographic maps, existing databases and information systems, published and unpublished reports, aerial photographs and field and aerial observations. Areas were identified irrespective of tenure. Consequently, natural areas which are administered by the Department of Conservation, as well as other protected areas, were also surveyed using the same methodology. This provided a consistent approach to determine the representativeness of unprotected natural areas.

Each site recorded was mapped, allocated a generic number and described ecologically. Having evaluated the sites (see Section 2.4 below), they were grouped according to one of two levels of ecological significance. Scientific names of species for which common names have been used can be found in Appendix 8.5 (fauna) or Appendix 8.6 (flora).

In the writing of this report, extensive use was made of information from existing biological databases and information systems such as the Sites of Special Biological Interest (SSBI), Threatened Plants Database, NIWA Freshwater Fish Database, Amphibians and Reptiles Database, Bio-sites, published information and Department of Conservation internal reports. The SSBI database in the Northland Conservancy was the source of a considerable amount of information, particularly concerning fauna. Herbarium records from Auckland Institute and Museum and Landcare Research, Lincoln, were also consulted. Geographical and geological information was gained from existing published and unpublished maps.

Although many sites were not surveyed in detail, a large amount of information was collected, considerably expanding the information base for the Ecological District. It is important to note that, due to the tight timetable and budget constraints, it is possible that some natural areas may have been overlooked.

2.2 CONSULTATION WITH LANDOWNERS

Personal contact with all landowners was not possible because of the magnitude and geographic range of the surveys being undertaken. Therefore, all ratepayers were advised by mail by way of a leaflet (Appendix 8.2) informing

them of the programme and the reason for it. The leaflet was signed by the then Regional Conservator of the Department of Conservation, Northland Conservancy and provided contacts for further information.

A press release on the survey methodology and photograph of the survey team was issued and featured in the local newspapers (see Appendix 8.2).

In many instances permission for access was sought from landowners either by telephone or direct visit, and was generally given. In very few cases was access refused.

Iwi consultation was undertaken by the then Northland Conservancy Protection Manager with Te Rarawa at hui attended throughout the District and with Ngapuhi runanga at meetings in Kaikohe.

2.3 DATA ACQUISITION AND ANALYSIS

A rapid reconnaissance field survey was carried out to record and map the ecological and geomorphological characteristics, habitat type and canopy vegetation of each identified natural area. Most of this work was carried out from roads, foreshores or high points using telescopes and binoculars.

Some sites were not surveyed in this manner due to either the site being very isolated, or failure to obtain landowner permission for access. In these instances, sites were identified and described from aerial photographs. Information on some of these sites, therefore, remains limited, and it is likely that some vegetation associations have not been recorded.

Natural areas were mapped using five broad categories of habitat types: forest, shrubland, wetland, duneland and estuary (see Appendix 8.7 for definitions).

At each site, the composition and relative abundance of canopy plant species were recorded on the field survey sheet (see Appendix 8.1) in the following four categories: greater than 50% cover was described as “abundant”; 20–50% cover as “common”; 5–20% cover as “frequent”; and less than 5% cover as “occasional”.

Canopy composition based on percentage cover abundance is widely considered to be an appropriate method of describing forest stands. This technique and variations of it, have been used to describe canopy composition both within New Zealand (see Atkinson 1962, 1985; Leathwick & Rogers 1996; Park & Walls 1978) and in other parts of the world (see Kershaw & Looney 1985; Mueller-Dombois & Ellenburg 1974). The specific technique for vegetation description at each site is based on the approach described in Myers et al. (1987).

This semi-quantitative method was favoured because of the time constraints for the field survey and the extensive areas to be covered, and because it could be applied to all vegetation types, with ground cover plant species or substrate being recorded in non-forest habitats.

More detailed, and therefore more time-consuming and expensive methods, would not necessarily provide more useful information for assessing representativeness. The disadvantage of this survey approach is that it did not

provide a great deal of information on the distribution of uncommon and threatened species and understorey species.

Species present in the “abundant” and/or “common” columns of the survey sheets were used to define the dominant vegetation component of each ecological unit. Details of each site were entered into an ACCESS database, and each ecological unit recorded at that site was listed on the database. A search on each ecological unit gave information on the frequency of the different ecological units remaining in the Ecological District. This information was used to determine the representativeness of each ecological unit (see Section 5. Summary and conclusions, Table 2, (p. 250). Ecological units recorded in the Hokianga Ecological District and protected status).

Landform and geology were identified using information from published and unpublished maps, reports and topographical maps. This information was combined with vegetation types to determine ecological units defined by particular vegetation-geomorphological characteristics, e.g. kanuka forest on hillslope, raupo reedland in swamp. Most sites contained a range of ecological units.

Other relevant information such as fauna observations, threats and landowner information collected incidentally was also recorded on the survey sheet for each site. Once the field reconnaissance or survey had been completed, sites were numbered, and information from other databases and information systems, e.g. SSBI and threatened species information, was incorporated into the site descriptions. Survey forms are held by the Department of Conservation, Northland Conservancy Office, Whangarei.

2.4 CRITERIA FOR ASSESSING HABITAT SIGNIFICANCE

The natural areas described in this report meet at least one of the following criteria:

- They are predominantly of indigenous character, by virtue of physical dominance or species composition in the canopy.
- They provide habitat for a threatened indigenous plant or animal species.
- They include an indigenous vegetation community or ecological unit, in any condition, that is nationally uncommon or much reduced from its former extent.

The conservation values of these areas were assessed using a two-level classification of habitat significance based on the PNAP ecological criteria of representativeness, rarity and special features, diversity and pattern, naturalness, habitat structure and characteristics important for the maintenance of ecosystems (buffer, linkage or corridor, size and shape) (see Table 3, p. 272).

The PNAP criterion of long-term viability has not been included in Table 3. Long-term viability was considered under the umbrella of representativeness, diversity and pattern, naturalness, size and shape.

Level 1 sites

A level one site contains significant vegetation and/or significant habitats of indigenous fauna and is defined by the presence of one or more of the following ecological characteristics:

1. Contains or is regularly used by critical, endangered, vulnerable or declining or naturally uncommon taxa (i.e. species and subspecies), or taxa of indeterminate threatened status nationally.
2. Contains or is regularly used by indigenous or endemic taxa that are threatened, rare, or of local occurrence in Northland or in the Ecological District.
3. Contains the best representative examples in the Ecological District of a particular ecological unit or combination of ecological units.
4. Has high diversity of taxa or habitat types for the Ecological District.
5. Forms ecological buffers, linkages or corridors to other areas of significant vegetation or significant habitats of indigenous fauna.
6. Contains habitat types that are rare or threatened in the Ecological District or regionally or nationally.
7. Supports good populations of taxa which are endemic to Northland or Northland-Auckland.
8. Is important for endemic and indigenous migratory taxa.
9. Covers a large geographic area relative to other similar habitat types within the Ecological District.

Level 2 sites

A Level 2 site is a natural area that supports populations of indigenous flora and fauna not identified as meeting the criteria for Level 1. It is a site which:

- contains common indigenous species but which is not one of the best representative examples of its type;
- may be small and isolated from other habitats;
- may contain a high proportion of pest species;
- may be structurally modified, e.g. forest understorey grazed;
- **has not been surveyed sufficiently to determine whether it meets the criteria for Level 1 sites.**

The site evaluations were made on the basis of data available. Some Level 2 sites are likely to meet Level 1 criteria, following a more detailed survey.

2.5 UPDATING OF DATA

Natural ecosystems and habitats are dynamic and are forever changing, both physically and biologically. Some areas are more dynamic than others, e.g. wetlands, which are particularly susceptible to changes in groundwater hydrology, whilst others, e.g. forests, change more gradually. The status and composition of species also changes over time and this could result in changes in the conservation value of some habitats.

LINKS BETWEEN THE PNAP CRITERIA AND LEVELS 1 AND 2.

PNAP CRITERIA	LEVEL 1	LEVEL 2
Representativeness ¹	Contains the best representative examples in the Ecological District of a particular ecological unit or combination of ecological units. (3) Supports good populations of taxa which are endemic to Northland or Northland-Auckland. (7)	Not one of the best examples of its type in the Ecological District.
Rarity and Special Features	Contains or is regularly used by critical, endangered, vulnerable or declining or naturally uncommon taxa (i.e. species and subspecies), or taxa of indeterminate threatened status nationally (1). Contains or is regularly used by indigenous or endemic taxa that are threatened, rare, or of local occurrence in Northland or in the Ecological District (2). Contains habitat types that are rare or threatened in the Ecological District or regionally or nationally (6). Is important for endemic and indigenous migratory taxa (8).	Does not regularly contain, or there is no currently known threatened, rare, or species of local occurrence. Contains common habitat types. No currently known special features.
Diversity and Pattern	Has a high diversity of taxa or habitat types for the Ecological District. (4).	May contain only one habitat type and/or have a low diversity of taxa relative to other areas of a similar type.
Naturalness	Exhibits a higher level of naturalness than other examples of its type.	Exhibits a lower level of naturalness than other examples of its type.
Buffering/corridors and Linkages	Forms ecological buffers, linkages or corridors to other areas of significant vegetation or significant habitats of indigenous fauna.(5)	May be heavily impacted by external influences or may be fragmented and isolated from other natural areas
Size and Shape	Covers a large geographic area relative to other similar habitat types within the Ecological District. (9)	Is likely to be small relative to other similar examples of its type, or if large, is not the best example of its type and meets no other criteria for a Level 1 site.
Long-term Ecological Viability	If the long-term viability of the site is high or medium, it is likely to meet one or more of the other criteria above, or if low, may nevertheless be the best or only example of its type in the Ecological District.	May require a high degree of management to achieve viability or may never be viable under present circumstances or, if viable, may not meet any other criteria for a Level 1 site

¹ Best representative examples include sites with the highest level of naturalness, diversity, in the best condition, and with values other than ecological values such as cultural and amenity values (where known).

Human-induced activities and changes, both within or adjoining significant natural areas, can accelerate the processes of change. Fire, followed by the invasion of adventive weeds, can dramatically modify shrublands. Drainage of adjoining land can alter the water tables of wetlands, thereby lowering the quality of the habitat and facilitating the establishment of weeds. Ongoing piecemeal destruction or modification of habitats and sustained grazing of bush remnants will, in the long term, completely eliminate some habitats.

It should also be noted that it is close to ten years since most of the sites in this report were surveyed, and it would be expected that the majority of fern and

shrubland areas, if they still exist, would exhibit notable changes in terms of succession. Some ecological units may have altered significantly or even be replaced completely, and descriptions of vegetation height may no longer be accurate.

The natural areas identified in this survey will therefore require regular monitoring to note changes in both species and habitat composition and condition.

3. Ecological character

3.1 TOPOGRAPHY/GEOLOGY

The topography of the Ecological District is dominated by the large drowned valley estuarine system of the Hokianga Harbour (11,065 ha), together with the smaller Whangape Harbour (916 ha) and Herekino Harbour (490 ha) to the northwest. The surrounding areas feature moderately steep, dissected, slump-prone hill country of up to 260 m elevation. There are extensive ribbons of freshwater wetlands and alluvial flats along valleys draining into the three harbours, and a large area of sand dunes on Hokianga North Head.

Geology

Hill country is predominantly on allochthonous Cretaceous–Paleocene Mangakahia Complex sandstone and in faulted thrust-slivers of mudstone and siliceous mudstone with minor Oligocene Motatau Complex muddy limestone. Lower Miocene Otatau Group cover strata, comprising mostly sandstone and igneous conglomerate, are present north of Hokianga Harbour entrance, near Otatau, and in fault slivers near Motuti. Hokianga North Head has a cover of Pleistocene consolidated dune sands and Holocene transverse dunes (Brook 1996).

Soils

Soils of most of the Hokianga Harbour catchment are moderately to strongly leached clays, with thin topsoils. The main river valleys contain free-draining alluvial soils, but this is of limited extent. Soils on the high, steep forested hills are of volcanic and/or greywacke origin. Soils of hill country and river flats are mainly of sandstone and mudstone origin (Davis & Bellingham 1984).

3.2 CLIMATE

There is little weather information from meteorological stations within the Ecological District. Data from Kaikohe, Kerikeri Airport, or Punakitere (just outside the southeast of the Ecological District) are used for consideration of inland conditions, and from Opononi, at the boundary of the District on the

southern shores of the Hokianga Harbour and Dargaville, for similarity to areas near the harbours.

The Hokianga Ecological District has a mild, humid, and rather windy climate. Much of the District lies between sea level and 200 m elevation. Prevailing winds are from the southwest. Mean annual windspeed at Punakitere is 11 km per hour, with stronger winds likely in exposed areas.

Rainfall averages 1467 mm per annum at Opononi (low altitude coastal area), and 1766 mm per annum in Kaikohe (204 m asl). The driest months are at December–March, when 24% of the annual rainfall occurs at Opononi, and 26% at Kaikohe. November and January are the driest months at Kaikohe. Heavy rainfall occurs as a result of depressions of a tropical origin, or when northeasterly flows arise between ridges of high pressure to the east and troughs over the Tasman Sea.

Mean annual temperature data are not available from stations within the Ecological District, but the temperature varies between 14°C and 15.5°C in the central and western areas of Northland. Data from both Kaikohe (204 m asl) and Dargaville (sea level) indicate that February is the warmest month, with the mean temperature being 19°C and July is the coldest month (mean 10°C). Daily temperature variations are minor, with few extremes of temperature. Ground frosts can be frequent throughout Northland in sheltered inland areas. An average of 25 ground frosts per month have been recorded at Kerikeri and 17 at Dargaville.

Fog occurs on average 74 days per year at Umawera, 36 days at Punakitere, and 54 days at Dargaville. Thunderstorms occur on approximately 6 days per year, mostly between March and August.

The District has about 2000 hours of bright sunshine per year (Moir et al. 1986).

3.3 VEGETATION

3.3.1 Historical

Prior to human settlement, most of Hokianga was forested, apart from the huge dunes on the north side of the harbour entrance and extensive wetlands on the harbour margins.

Some of the earliest European visitors noted that kauri abounded “as far as my eye could reach” (Ensign McCrea from the *Dromedary* in 1820 (Sale 1978)). A later party recorded “the lofty and luxuriant cowry grows in great profusion close to the water’s edge.” (Sale 1978).

In 1851, Jolliffe, surgeon on the ship *Pandora*, wrote

the whole of the land in this district appears exceedingly rich and everywhere shows evidences of having at no very remote period been more than thinly populated than it is at present, the native villages at present are very thinly scattered and at very considerable distances from each other, and the villages themselves are small, few containing more than a hundred inhabitants; the greater part of the low ground and the hills invariably are all most thickly covered with almost impenetrable forests of fine timber trees par-

ticularly the “kauri” and other Pines [rimu and kabikatea]; here and there are cleared patches of land well planted by the natives with corn, potatoes, taro, onions and many other useful vegetables, the neat fences and bright green colour of the fields and gardens in these spots contrast most pleasingly with the more dusky and sombre hue of the surrounding forests. (Lee 1987)

Heavy growth of kauri grew close to the Mangamuka, Orira and Waima Rivers (Lee 1987).

Harakeke (flax) was common in the wetlands.

Today few large tracts of forest remain, representing fragmented remnants of the former extensive woodlands. Freshwater wetlands are rare. Significant areas of mangrove forest, tidal flats and coastline have also been lost or modified through stop-banking, clearance and grazing. For example, approximately 27% of the Hokianga Harbour’s intertidal zone has been lost to reclamation, while the vegetated intertidal zone has been reduced by 45% (Chapman 1978).

Much of the remaining habitat in the Ecological District comprises secondary shrubland and forests on steep, dissected hillsides, uneconomical for production, but which was extensively cleared in the heyday of agricultural subsidies.

3.3.2 Broad pattern

All of the largest remaining forest tracts on the west of the Far North are in other adjoining Ecological Districts (Herekino and Raetea in Maungataniwha Ecological District, the Ahipara and Warawara Forests are in Ahipara Ecological District, Puketi-Omahuta Forest is in Puketi Ecological District and Waipoua-Waima-Mataraua forest tract in Tutamoe Ecological District). Hokianga Ecological District also adjoins Tangihua and Kaikohe Ecological Districts in the south and east.

However, the remnants remaining in the Hokianga Ecological District fulfil a collectively significant role providing ‘stepping stones’ or partial linkages between the large forest tracts, e.g. at Waiohew, linkages between Herekino Forest in Ahipara Ecological District are created with Raetea Forest in the Maungataniwha Ecological District. In the Broadwood area, there are numerous sites in close proximity creating linkages from Raetea to Warawara Forest in the Ahipara Ecological District; other linkages occur from Tapuwae through Mangamuka to Puketi, and from Mataraua, east into Tangihua and Kaikohe Ecological Districts.

The Hokianga Ecological District is characterised by low, broken hill country with fragmented forest remnants and regenerating shrublands and forests; there is an apparent absence of any definitive ecological gradients in the terrestrial habitats, and much of the vegetation is characterised by a mosaic of canopy species.

A feature of this District is the persistence of the emergent structure in many of the forests remaining, in comparison with that remaining in other Ecological Districts in the Far North. Research efforts over the last decade (O’Donnell & Dilks 1987; Spurr et al. 1992; Warburton et al. 1992) have clearly indicated the importance of large, old, emergent trees, especially rimu, to a variety of bird

species. Bat species show a preference for old podocarps, kauri and beech for roosts (O'Donnell 2001). As most of the forests in Northland have been heavily logged, especially for emergent podocarp and kauri, any remaining large trees assume an even greater ecological importance. Several of the sites included in this report are characterised by emergent trees, which contributes considerably to their ecological significance.

Forest remnants, especially those that have corridor and linkages between them, are very important for maintaining biodiversity, especially for invertebrate abundance and species diversity (Harris & Burns 2000). Such remnants, including regenerating vegetation, are also important for the threatened NI brown kiwi.

Characteristics of the current vegetation of the District include the more conspicuous element of kahikatea when compared to adjacent Ecological Districts, especially those in Eastern Northland, and the relative lack of kauri presence.

However, the focus of the District is the Hokianga Harbour itself, New Zealand's fourth largest harbour (see Site Report O05/152), and the associated wetlands, riparian forests and shrublands adjacent to it, which reflect a coastal influence, and are of great importance. A noticeable feature of the District is the small number of wetlands outside of the margins of the harbours.

There are also very few records of plant species that are nationally threatened or regionally significant compared to adjacent Ecological Districts. Further survey work may reveal new records.

As this study was in the nature of an overview rather than in-depth, the main vegetation types are described below in general terms.

3.3.3 Main vegetation types

Wetlands

This Ecological District contains three extensive harbour systems; therefore estuarine vegetation types are well represented. The ecotone between saline and freshwater wetland systems contains a diversity of estuarine communities dictated by salinity, drainage, slope, and degree of sedimentation.

In contrast to other Northland harbours, e.g. Rangaunu Harbour in the Aupouri Ecological District, beds of the saline herb glasswort are rare in harbours within the Hokianga Ecological District.

Harbours/Estuarine

SALINE WETLANDS

Mangrove shrubland and forest

This is the most common estuarine vegetation type present in all three harbours. Taller mangroves generally fringe the main channels, with lower mangroves on the landward side. Where the substrate is less muddy, a sparse ribbon of mangroves may occur along the shore.

A dense understorey of seedlings usually occurs under the taller trees, and open spaces of bare ground are frequent. Sea rush, oioi, saline herbs, saltmarsh ribbonwood, and pohuehue may occur on the landward edge.

Sea rush saltmarsh

Sea rush is mostly found in mid to lower harbour regions, where it forms monospecific swards. Clumps of oioi, and occasional mangroves occur with patches of saline herbs and pohuehue on better drained areas, usually on the landward margin.

Sea rush–mangrove association

Sea rush and lower mangroves form open associations, with frequent areas of bare ground or oioi.

Oioi–sea rush saltmarsh

A mosaic of these two species is found in upper reaches of estuaries. Isolated mangroves, raupo, manuka and saltmarsh ribbonwood occur in this habitat type.

Oioi saltmarsh

This saltmarsh vegetation type is common in the brackish upper reaches of the harbours where dense swards up to 1.5 m tall occur, with occasional scattered mangrove trees. Saltmarsh ribbonwood fringes the channels and occasional patches of raupo and sea rush are present.

Bachelor's button–*Isolepis cernua*–sea primrose–*Selliera radicans* herbfield

This vegetation type is widespread but limited in area. It is found generally near the land's edge and consists of sparse saline-tolerant herb species such as bachelor's button (common where reclamation has occurred), *Isolepis cernua*, sea primrose (the most common), and *Selliera radicans*. *Triglochin striata* and *Paspalum vaginatum* may also be present.

***Paspalum vaginatum* grassland**

The exotic grass *Paspalum vaginatum* forms dense swards on higher ground and beneath taller mangroves.

***Spartina alterniflora* grassland**

Dense swards up to 1 m tall of the invasive exotic grass, *Spartina alterniflora* cover tidal flats beneath mangroves in the mid-Hokianga Harbour. *S. × townsendii* is found locally with sea rush.

BRACKISH WETLANDS

- oioi-raupo-saltmarsh ribbonwood-sea rush associations in which *Coprosma propinqua*, manuka, and harakeke may be frequent, and are found mainly in brackish, tidal arms of rivers.
- oioi-saltmarsh ribbonwood with occasional raupo and marsh clubrush (Hautau Stream Remnant).
- raupo-sea rush (Whangape Harbour).
- harakeke-*Juncus* sp. with occasional raupo (Upper Herekino River).
- harakeke-saltmarsh ribbonwood with frequent raupo and occasional mangrove (Upper Herekino River).
- manuka-saltmarsh ribbonwood with frequent ti kouka and occasional harakeke (Upper Herekino River).

- manuka-raupo with isolated kahikatea, ti kouka, harakeke, and saltmarsh ribbonwood (Upper Herekino River).
- manuka shrubland with occasional ti kouka, saltmarsh ribbonwood, and *Hebe* (Upper Herekino River).
- harakeke-raupo-ti kouka association with saltmarsh ribbonwood (Vujcich Rd Swamp—head of Omanaia River).
- marsh clubbrush sedgeland—a small amount of this type occurs along riverbanks in the upper reaches of the rivers. Small, dense stands of marsh clubbrush to 2 m occur with scattered *Coprosma propinqua*, raupo, harakeke and giant umbrella sedge.

FRESHWATER WETLANDS

Swamp shrubland

- kanuka/manuka-ti kouka swamp shrubland with frequent raupo and *Juncus* species at Pahangahanga Remnant.
- *Coprosma propinqua* shrubland with occasional raupo, ti kouka, kohuhu, kahikatea, mapou, harakeke, *Hebe*, kowhai, and totara at Motuti Coastal Remnants, Oraoa Stream Saltmarsh and Hautau Stream Remnant.
- *Coprosma propinqua*-manuka-ti kouka shrubland at Hautau Stream Remnant.
- harakeke-*Coprosma propinqua*-manuka-ti kouka shrubland at Rangiahua Wetland with frequent raupo, crack willow and occasional kowhai, kahikatea, *Coprosma tenuicaulis*, *C. robusta* and *Carex virgata*.

Raupo reedland

Raupo is the dominant freshwater wetland type in this District. It occurs at 20 wetland sites covered in this survey. The largest and most significant raupo swamps are those occurring at the head of estuaries at Herekino, Awaroa River and Lower Waihou, and at Ninihi, Whawharu, and Tapuwae. Other areas where raupo is the sole dominant species are mostly small and occur along stream valleys.

Other raupo-dominant associations in the Ecological District include:

- Raupo is abundant and harakeke common at Oraoa Stream Saltmarsh.
- Raupo is abundant with common *Juncus* sp. at Kohe Stream Remnants and Whangape Harbour.
- Raupo is co-dominant with giant umbrella sedge at Upper Herekino River and Haumanga Rd Wetland.

OTHER WETLAND TYPES

Other wetland types that occur include:

- *Baumea articulata*-kikuyu at Motuti Coastal Remnants.
- *Baumea rubiginosa* at Motuti Coastal Remnants.

OPEN WATER

No natural lakes or ponds have been identified in this Ecological District. Six constructed ponds (O05/021, O05/050, O05/068, O05/153, O06/032 (includes two ponds) and one constructed wetland (O05/027) with native plant and animal communities were recorded.

Dunelands

The only area where this type of vegetation is found in the Ecological District is on the northern side of the Hokianga Harbour entrance at Hokianga North Head. Much of the area is open, mobile sand, but *Spinifex* occurs on the foredunes with lupin. Shore bindweed is frequent and pingao and pohuehue are also present. *Spinifex* also occurs on a sandspit at Kawehitiki Point (006/034).

Sedges such as *Isolepis* and exotic grasses such as buffalo and kikuyu grass also occur on the dunes.

Shrublands

Most of the shrubland vegetation types in the District have manuka, kanuka or both as a major component.

Manuka shrubland

Manuka dominant shrubland is the most common shrubland type, occurring throughout the District at over 30 sites. At the majority of sites, manuka is solely dominant in the canopy. Associated species include bracken, mamaku, totara, towai, ti kouka and kahikatea.

Manuka occurs as a co-dominant in the following associations:

- manuka-towai shrubland occurs at Stephens Bush, Pareokawa Bush, Tutaetohia Stream Remnant and Landcorp Paponga Remnants.
- manuka-totara shrubland occurs at Upper Uwhiroa Catchment Remnants and “137” Awaroa River Shrubland.

Kanuka and manuka shrubland

Kanuka and manuka is dominant in the canopy at over 15 sites, many north of the harbour. Ti kouka, totara and towai may be frequent and puriri and kahikatea occasional. Areas of towai-kanuka/manuka shrubland occur at Mangakotukutuku Stream Forest and Rangi Point Remnants.

Kanuka shrubland

Kanuka is dominant in the canopy mainly in the northern part of the District but at only a few sites. Towai may be frequent, and totara and mamaku may also be present in the canopy. An area of kanuka-towai shrubland also occurs in this same vicinity.

Towai shrubland associations

Towai-dominant shrubland occurs at four sites, mainly towards the boundary of Maungataniwha Ecological District.

Shrub-fern associations

Shrub-fern associations identified in the Ecological District show an association with Maungataniwha Ecological District and occur near the boundary including:

- kanuka/manuka-ring fern at Central Waiotehue Rd Bush.
- bracken-mahoe at Umawera Bush.
- mamaku-manuka at Upper Herekino River.
- manuka-bracken at Upper Mangakotukutu Stream Forest.

Coastal shrubland

Coastal shrubland is represented by five vegetation types recorded in remnants adjacent to the Hokianga Harbour including:

- kanuka/manuka shrubland at five sites.
- kanuka/manuka-towai shrubland at one site.
- kanuka shrubland at one site.
- manuka shrubland at three sites.
- manuka-totara shrubland at one site.
- In the upper reaches of the Whangape Harbour, *Coprosma propinqua*-manuka-totara is recorded at Haumanga Rd.

Forest

The Hokianga Ecological District contains a large number of forest associations.

BROADLEAF FOREST

Taraire forest

Taraire-dominant forest is the most common broadleaf forest type within the District, occurring at over 30 sites. This type is more prevalent in the north and east of the District. Frequent species within the canopy include towai, kahikatea, and totara to a lesser extent.

Taraire-dominant forest contains a range of occasional canopy species including puriri, tawa, lancewood, white maire, kowhai, titoki, hinau, pukatea, karaka, rewarewa, kohekohe, toro, mamangi, kanuka, nikau, ti kouka, mamaku, northern rata, rimu, miro, matai and kauri. Northern rata, kahikatea, rimu and kauri are also present as occasional emergents.

Taraire–towai forest

Taraire and towai co-dominant forest occurs at 20 sites, mainly in the northern area of the District and is the second most common broadleaf forest type in the District. Kahikatea, totara, puriri and northern rata are the most common species found frequently within the canopy and a range of other canopy species occur occasionally.

Towai forest

Towai forest occurs at 9 sites, many of which reflect previous disturbance, and all but one are north of the Hokianga Harbour. The undisturbed sites tend to have a greater diversity of canopy trees and occasional emergents. Associated species are primarily manuka, kanuka, totara and puriri.

An unusual association occurs at Hokianga North Head where co-dominant kanuka/manuka and towai occur on sand. Pohutukawa is frequent and tanekaha and kauri occasional at this site.

Puriri–taraire forest

Co-dominant puriri and taraire forest occurs at five sites. Kahikatea, karaka and kohekohe are frequent species in the canopy with occasional emergent podocarps and northern rata.

Kanuka and manuka forest

Kanuka/manuka forest is dominant at 6 sites, kanuka alone at four, manuka alone at four and kanuka is co-dominant with towai at two sites. All kanuka/manuka and kanuka forest sites occur north of the Hokianga Harbour, with only one of manuka-dominant sites occurring south of the harbour.

Other broadleaf forest types

Other broadleaf forest types include:

- nikau-puriri-towai forest at Tapuwae Forest & Outliers.
- swamp maire forest at Waoku Coach Rd Wetlands.
- northern rata-taraire forest at Upper Uwhiroa Catchment Remnants, at the Ahipara/Maungataniwha Ecological District boundary and has similarities to both these Districts.
- pukatea-taraire-towai forest at Northern Mataraua Forest and Waiwhakaruku Bush.

PODOCARP FOREST

Kahikatea forest

Kahikatea forest occurs as a sole dominant vegetation type at 16 sites. Old-growth kahikatea forest occurs at Upokowhawa Forest Remnant, representing one of only a few unlogged pockets of this forest type in the District. Most of the examples comprise secondary forest. Within this forest type, pukatea and totara can be frequent in the canopy and a range of occasional species including rimu, rewarewa, titoki, puriri, and ti kouka.

Four sites occur on alluvial terraces, all in the southeast of the District. Totara and rimu are frequent and a range of other species occasional.

Kahikatea-totara forest

Kahikatea and totara are co-dominant at 11 sites. Vigorous regeneration of this forest type occurs on the north side of the harbour.

Totara forest

Totara forest occurs at six sites and all are secondary regrowth.

Rimu forest

A small area of secondary rimu-dominant forest occurs at Motuti, and at Rotokakahi, two unusual co-dominant associations occur with a range of broadleaf species.

BROADLEAF-PODOCARP FOREST

Kahikatea-taraire forest

Kahikatea and taraire forest is the most common broadleaf-podocarp forest in the District occurring at seven sites.

Other co-dominant associations

Kahikatea is co-dominant with a range of broadleaf canopy species including:

- kahikatea-nikau-puriri-taraire forest at Upokowhawa Forest Remnant.
- kahikatea-puriri forest at Pearce Block Remnants.
- kahikatea-ti kouka forest at Whawharu Swamp, Lower Waihou Swamp & Shrubland, and Waoku Coach Rd Wetlands.

- kahikatea–tanekaha forest at Wheoki Stream/Pukemaire Remnants.

A wide range of other co-dominant associations occur (see Coastal Forest below) primarily involving taraire, totara, kahikatea, puriri, and towai.

Regenerating forest with kanuka/manuka and a podocarp species co-dominant in the canopy occurs at various sites including:

- kanuka/manuka–kahikatea forest at Motuti Coastal Remnants.
- kanuka/manuka–tanekaha–totara forest at Maungapohatu Bush, Pukekohe Stream Bush and Paponga–Mata Rd Association.
- kanuka–rimu forest at Pukemiro Remnants.
- manuka–kahikatea forest at Otawhiti Bush.

Numerous other combinations of secondary manuka, kanuka, kahikatea and totara forest occur (see Table 2, page 250). In general, these combinations occur over small or fragmented areas and reflect a history of vegetation disturbance. Although the extent of some of these ecological units is small, collectively, they are important reservoirs of podocarp forest (many are found in Level 2 sites), with considerable potential for restoration and enhancement.

Tanekaha occurs as a co-dominant species in other broadleaf-podocarp forest types including:

- kanuka/manuka–tanekaha–totara forest at Maungapohatu Bush and Mata Rd Intersection Remnant.
- tanekaha–kanuka/manuka–totara forest at Te Konoke Bush.
- tanekaha–taraire–towai forest at Matawera Rd Bush.
- tanekaha–taraire–totara forest at Mata Rd Intersection Remnant.
- taraire–tanekaha forest at Wheoki Stream/Pukemaire Remnants.
- tanekaha–totara forest at Blue Mountain Rd Bush.
- kanuka/manuka–tanekaha–towai forest at Tapuwae Scenic Reserve and Te Karae Station Remnants.
- manuka–tanekaha forest at Opara Rd QEII Remnant (also coastal).

Tanekaha also occurs as a co-dominant in some coastal forest types (see below).

Kauri forest associations

The Hokianga Ecological District contains very few sites in which kauri is abundant or common in the canopy.

Those represented are restricted to broadleaf–kauri forest types which have only been recorded once including:

- kauri–rewarewa–taraire forest with frequent kahikatea at Taumatawhauwhau Forest Outlier representing a very unusual forest association.
- kanuka/manuka–kauri forest at Waiotehue Reserve.
- manuka–kauri forest at Te Hurunga Forest.
- manuka–kauri–mamangi coastal forest at Wheoki Stream/Pukemaire Remnants.

COASTAL FOREST

Coastal forest occurs at Hokianga North Head and as remnants adjacent to the Hokianga Harbour including:

- pohutukawa forest at Hokianga North Head Coastal Associations.
- nikau-taraire forest at Motuti Coastal Remnants.
- kanuka/manuka-tanekaha-totara forest at Te Karaka Point Coastal Forest, Motukaraka Remnant and Hautau Stream Remnant.
- puriri-totara forest at Orira River Remnant.
- kahikatea-tanekaha forest at Wheoki Stream/Pukemaire Remnants.
- mamaku-nikau-ti kouka forest at Wheoki Stream/Pukemaire Remnants.
- kanuka/manuka-puriri forest at Herekino River South Remnants and Rawhia Forest Remnants.

Kowhai is common or frequent at seven coastal sites, all of which contain different assemblages of species. They include:

- manuka shrubland with frequent kowhai at Rotowhenua River Shrubland.
- kanuka/manuka forest with frequent totara, kahikatea, kowhai and occasional puriri, kohuhu, kauri and pohutukawa at Te Karaka Point Coastal Forest.
- kanuka/manuka-kowhai-mamangi forest with frequent karaka and pohutukawa at Te Karaka Point Coastal Forest.
- karaka-kohekohe-kowhai-puriri forest at Hokianga North Head Coastal Associations.
- kowhai-puriri-taraire forest with frequent tawa, kahikatea, kohekohe, totara, and kanuka and occasional titoki, northern rata, nikau, karaka, rewarewa, and pukatea at Panguru/Pukepoto Shrublands.
- kahikatea-kowhai-manuka-puriri forest with frequent titoki and ti kouka and occasional rewarewa, pukatea, karaka, kauri, taraire, nikau and totara at Wheoki Stream/Pukemaire Remnants.
- kahikatea-kowhai-puriri forest with frequent kanuka and occasional rewarewa at Tapuwae Scenic Reserve.

3.3.4 Species of botanical interest

There is very little recent information about specific botanical values in the Hokianga Ecological District. This probably reflects the limited survey work done in this area as well as the extensive loss of biodiversity, and possibly the physical homogeneity of western Northland hill country.

The Hokianga Ecological District was a popular collecting area of the early New Zealand botanists. Indeed, several specimens collected from the Hokianga by Alan and Richard Cunningham early in the 19th century were used to describe and name the plant species making these collection points the 'type localities'. These plants include the Northland endemic *Ackama rosifolia* (makamaka), *Alseuosmia macrophylla*, and the dune species *Pimelea arenaria*, and *Coprosma acerosa*.

Pseudowintera axillaris (horopito) and *Ranunculus rivularis* were collected by Alan Cunningham in 1826 on the banks of both Kawakawa and Hokianga Rivers (Cunningham 1838). Today horopito only occurs sparsely in Northland mostly at higher altitudes.

Notable plants include kawaka and wharangi, which have a local but widespread distribution in Northland. In this Ecological District these species are uncommon.

3.3.5 Threatened plant species

(See Appendix 8.3 for Categories of threat)

Of the plant species listed in the New Zealand Threat Classification System lists (Hitchmough 2002) 10 have been recorded in this Ecological District. However, four of these have not been recorded recently and are likely to have disappeared from the District. This could reflect the extent of modification of natural areas, or simply the limited botanical surveying which has occurred.

***Mazus novaezeelandiae* subsp. *impolitus* f. *impolitus* – Serious Decline**

A perennial creeping herb found in New Zealand from near Cape Maria van Diemen (Te Paki Ecological District) south to Dunedin. Grows mainly in coastal sites, particularly damp hollows and sand flats. In 2000, plants were found in this Ecological District by K. Riddell/N. Syddall at Wairoa Stream, Hokianga North Head (Threatened Plants Database). Previously recorded by Mason (1949) from Te Waihopai Stream.

***Desmoschoenus spiralis* – Gradual Decline**

An increasingly uncommon sand binder, forming colonies on less stable sand dunes throughout New Zealand. Recorded from Hokianga North Head and Hokianga Harbour in this Ecological District.

***Eleocharis neozelandica* – Gradual Decline**

A sedge that grows on sandy margins of dune lakes and tidal creeks and damp sandy areas. Forms distinctive dark patches, often on sand flats at stream exits on open beaches. In Northland found north of Hokianga Harbour at Mitimiti, Ahipara, Aupouri Peninsula, and Te Paki and also at Pouto Peninsula. Pouto Peninsula is the stronghold.

***Pimelea arenaria* – Gradual Decline**

Known as sand daphne. A low spreading silky-leaved shrub found growing on coastal dunes and hollows. Relatively widespread in parts north of Auckland (Given 1981). However, decreasing in other parts of New Zealand and perhaps extinct in the Canterbury/Westland region (Wilson & Galloway 1993). The northern populations differ from southern plants. Recorded by K. Riddell from Hokianga North Head in 1999 (Threatened Plants Database).

***Kortbalsella salicornioides* – Sparse**

A distinctive hemi-parasitic herb usually found on manuka and kanuka in Northland. Endemic to North and South Islands, it is found in several localities in Northland where it may be locally common. Often found on saltmarsh edges. In this District recorded from Motuti Coastal Remnants and the Hokianga Harbour.

***Pittosporum virgatum* – Sparse**

Confined to scattered locations in Coromandel and Northland, this species has a distinct juvenile form in which leaves and branchlets are densely hairy and the leaves diverse in form, often lobed. Plants may flower while still in the semi-

juvenile stage (Allan 1961). Found at Maungakotukutuku, Pearce Block Remnants (1986) and Rawene (1987, one plant seen) (Threatened Plants Database).

3.3.6 Threatened species not recorded for some time in the Ecological District

***Sebaea ovata* – Nationally Critical**

A short-lived, small herb which only lives 8–10 weeks over summer. Now probably extinct in Northland. In this District it was previously recorded by Richard Cunningham in 1834 from ‘bogs at Mangamuka’ (Threatened Plants Database). Now only occurs in Wanganui dune hollows, although recently translocated (2002) to Pouto Peninsula (Kaipara Ecological District).

***Colensoa physaloides* – Gradual Decline**

A distinctive sprawling leafy shrub-like herb with hydrangea-like foliage and large blue and white flowers hanging in bunches and blue berries. It is a monotypic genus endemic to Northland, including some of its offshore islands. It is found scattered throughout forest areas, generally beside streams and tracksides and on talus slopes. Being vulnerable to browsing, it is not usually seen where feral goats or stock are present.

Last recorded in the Ecological District in 1977 beside a stream alongside the Herekino Harbour.

***Peperomia tetraphylla* – Sparse**

A spreading succulent herb also found in Australia and Polynesia. It is scarce in Northland, where it is usually known as an epiphyte. This species was recorded in 1987 from Rawene epiphytic on taraire (Threatened Plants Database), however, it is no longer present at this site (P.J. de Lange pers. comm.).

3.3.7 Regionally significant plant species

Australina pusila

A creeping herb with a very local distribution in Northland. Recorded from Reena Bush in this Ecological District.

Coprosma parviflora

Coprosma parviflora is endemic to Northland and is a distinctive shrub with branches lying on a flat plain. It is more common in Eastern Northland, but less so elsewhere. Recorded at Awaroa River Rd Remnant in this Ecological District.

Ileostylus micranthus

Also known as the green mistletoe, this species is a hanging hemi-parasitic shrub, which is attached to a host by a ball-like mass with twiggy suckers lying along host branches. Plants in Northland are recognised by their trailing lantern shape, with hosts including totara (often on fertile flats), *Coprosma* (especially *C. propinqua* in saltmarshes) and occasionally manuka, though many other hosts are known. Flowers are yellow-green, with plants producing masses of yellow fruit which are extremely sticky and are spread by birds. A common mistletoe throughout New Zealand but only locally common in Northland, where it is known to have declined. Also found on Norfolk Island. Known from

three sites within this District including a large population which was recently discovered at Rangiahua in the upper reaches of the Hokianga Harbour.

***Ixerba brexioides* tawari**

Widespread in the central North Island, this tree is uncommon in Northland, where it is generally only found in higher altitude and wetter sites. Recorded in this District from Te Karae Station Remnants.

Loxsoma cunninghamii

An endemic fern known from East Cape to Kaitaia, and found in this District at Mangakotukutuku Stream Forest.

***Nestegis cunninghamii* black maire**

An uncommon tree in Northland, found at Motuti and an isolated tree in the Umawera/Rangiahua area.

Olearia albida

A small coastal tree of local distribution; very similar to *O. angulata*. Recorded from Mangonuiwae Bush and Stephen's Bush in this District.

O. solandri

A coastal shrub found throughout the North Island with a restricted distribution in Northland, where it is only found in the Kaipara and Hokianga regions. In this District recorded from Motuti and Tapuwae.

Urtica incisa

Small nettle found throughout New Zealand but with a restricted distribution in Northland. Recorded in this District from Classens/Duddys Bush.

3.4 FAUNA

Information on fauna in this report has been compiled from SSWI (Sites of Special Wildlife Interest) and SSBI information systems, from Davis & Bellingham (1984), and from field observations during this survey. The conservation status of individual species is derived from Hitchmough (2002). Nomenclature follows Turbott (1990) and Heather & Robertson (2000) for birds, and Gill & Whitaker (1996) for reptiles.

A comprehensive discussion and checklist of fauna, particularly invertebrates, is beyond the scope of the present study. The individual site descriptions generally detail known significant fauna only. However, it is recognised that the invertebrate fauna, both common and less common, including snails and lizards, are a significant facet of indigenous ecosystems. With the present state of knowledge of these species, the protection of the whole range of habitat types is considered important to ensure populations of invertebrates are maintained.

Most of the common bird species of Northland, both indigenous and introduced, are to be found in the Ecological District.

Migrants to the harbours include royal spoonbill (Hokianga Harbour), SI pied oystercatcher (Hokianga Harbour), banded dotterel (Hokianga and Whangape

Harbours), pied stilt (Hokianga Harbour), lesser knot (Hokianga and Herekino Harbours), and bar-tailed godwit (Hokianga and Herekino Harbours).

A checklist of fauna recorded in this Ecological District is included in Appendix 8.5.

3.4.1 Threatened bird species

The Hokianga Harbour supports a large diversity of aquatic bird species, in particular good numbers of New Zealand waders, shags, ducks, gulls, and terns (Ogle 1982).

NATIONALLY CRITICAL

White heron *Egretta alba modesta*

Indigenous

Recorded in this District as an occasional visitor to the Hokianga Harbour. Recently recorded from the Waima River arm of the Hokianga Harbour in 2002 (R. J. Pierce pers. comm.).

NATIONALLY ENDANGERED

Australasian bittern *Botaurus poiciloptilus*

Indigenous

Recorded mainly from coastal wetlands at Whangape, Hokianga, and Herekino Harbours, although thought to be present in some other wetlands also. Davis & Bellingham's 1984 Hokianga Harbour study observed 42 bitterns on the harbour in mostly saline marshes and less commonly brackish marshes. Bittern also frequent mangroves and freshwater wetlands.

Brown teal *Anas chlorotis*

Endemic

Brown teal or pateke were formerly recorded from marshy upper areas around the Hokianga Harbour. There have been unconfirmed reports of brown teal from Waima since 2000 (R.J. Pierce pers. comm.).

Reef heron *Egretta s. sacra*

Indigenous

Reef herons have a scattered distribution around the rocky coastlines of New Zealand, with their decline attributed to increased human disturbance on the coast (Heather & Robertson 1996). Found in the Hokianga Harbour and coastline in this Ecological District.

NATIONALLY VULNERABLE

Caspian tern *Sterna caspia*

Indigenous

Found in the Herekino and Hokianga Harbours and coastline. Non-breeding visitors, fishing well up the harbours.

SERIOUS DECLINE

Grey duck *Anas s. superciliosa*

Indigenous

Recorded within the Hokianga Harbour and nearby wetlands in this Ecological District, the grey duck is threatened due to loss of habitat, hunting, competition and hybridisation with the mallard (Heather & Robertson 2000).

NI brown kiwi *Apteryx australis mantelli*

Endemic

Although reduced from former numbers due to habitat loss, predation by dogs, small predators and possibly pigs, NI brown kiwi are found throughout the District. Shrubland and regenerating forest areas are as important habitat as the mature forests. Many of the kiwi records in this District have come from Wendy Sporle (Kiwi Advocate) as a result of her advocacy role in the area over the last 6–10 years. Based on existing information, numbers of NI brown kiwi have heavily declined in the District, with only very few sites supporting moderate to high kiwi densities (R.J. Pierce pers. comm. 2003).

GRADUAL DECLINE

Banded dotterel *Charadrius b. bicinctus*

Endemic

Found in small numbers on west coast beaches and at Hokianga and Whangape Harbour.

Kukupu *Hemiphaga novaeseelandiae*

Endemic

Over recent years the population of kukupa has been severely depleted in this District from the combined effects of predation, competition, and heavy poaching. Found throughout the District.

Northern little blue penguin *Eudyptula minor iredalei*

Present in Hokianga Harbour and possibly other harbours; also along the coast. Breeding reported.

White-fronted tern *Sterna striata*

Indigenous

The most common tern around the New Zealand coast, white-fronted tern favour coastal waters and harbours. Recorded from the Hokianga Harbour in this Ecological District.

SPARSE

Banded rail *Rallus philippensis assimilis*

Indigenous

A species which was once widespread. Northland is its national stronghold.

Found mainly in saline marshes adjoining the Herekino and Hokianga Harbours (in high numbers).

Black shag *Phalacrocorax carbo novaehollandiae*

Indigenous

The second most common shag in the Hokianga Harbour, mainly found up sheltered arms (Davis & Bellingham 1984).

Little black shag *Phalacrocorax sulcirostris*

Indigenous

Frequents Hokianga Harbour and probably Whangape and Herekino Harbours. Less commonly encountered than pied and little shags.

Pied shag *Phalacrocorax v. varius*

Indigenous

Recorded from Hokianga Harbour and Pamonga Pond. In 1984, pied shag were the most common shag in the Hokianga Harbour (Davis & Bellingham 1984).

Marsh crake *Porzana pusilla affinis*

Indigenous

There are only a handful of records of marsh crake in Northland (P. Anderson pers. comm.). In this District recorded from coastal wetlands in the Mangamuka, Waihou, and unconfirmed records from Orira areas.

NI fernbird *Bowdleria punctata vealeae*

Endemic

Found mainly in wetlands (brackish marshes) and shrubland adjoining the Hokianga (high numbers) and Herekino Harbours.

Northern NZ dotterel *Charadrius obscurus aquilonius*

Endemic

Found in small numbers on west coast beaches, Herekino Harbour and sandy beaches on the north side of the Hokianga Harbour. Northern NZ dotterel are highly susceptible to disturbance by people and dogs during summer breeding periods.

NZ dabchick *Poliiocephalus rufopectus*

Endemic

Recorded only from wetlands at Classens/Duddys Bush in this Ecological District.

Spotless crake *Porzana tabuensis plumbea*

A species with restricted distribution, confined on the mainland largely to raupo swamps. In this District found mainly in wetlands adjoining the Hokianga and Herekino Harbours, but also in some other wetlands. Hokianga Harbour is one of only a few sites in New Zealand where the three swamp rails all occur.

COLONISER

Royal spoonbill *Platalea regia*

Indigenous

Recorded from the Waima River arm of the Hokianga Harbour in 2002 (R.J. Pierce pers. comm. 2002).

3.4.2 Regionally significant bird species

NI tomtit *Petroica macrocephala toitoi*

Endemic

Populations have been restricted by habitat fragmentation generally to large mature forested areas. In this District recorded from Classens/Duddys Bush, Tongaroa Stream Remnant (margin of Herekino Forest) and Te Karaka Point Coastal Forest.

Variable oystercatcher *Haematopus unicolor*

Endemic

Found in small numbers along the western coastline and around the Herekino and Hokianga Harbours. Variable oystercatchers are susceptible to disturbance during the summer nesting period.

3.4.3 Threatened mammal species

Northern short-tailed bat (*Mystacina tuberculata aupaoua*, Endemic - Nationally Endangered) and long-tailed bat (*Chalinolobus tuberculata*, Endemic - Nationally Vulnerable) are known from three adjoining Ecological Districts (Puketi, Tutamoe, and Ahipara) and may be present within the Hokianga Ecological District. Survey is needed.

3.4.4 Threatened invertebrate species

Northland tusked weta *Hemiandrus monstrosus*

Endemic Sparse

Northland tusked weta are found in the Paponga-Mata and Kohukohu areas in this Ecological District.

3.4.5 Threatened snail species

Kauri snail *Paryphanta busbyi*

Endemic Gradual Decline

The kauri snail is endemic to Northland and North Auckland region and is found throughout this Ecological District. Habitat loss/modification and heavy predation by animal pests continue to impact on kauri snail populations.

Phrixgnathus murchisoni

Endemic Nationally Endangered

This snail is endemic to Northland and is recorded from only two locations; Rawene (in this District) and Waima (Tutamoe Ecological District). There are no recent records of this species (last recorded a few decades back), and therefore survey is required to determine its current distribution and abundance.

Punctidae sp. 30 (referred to in Brook 2002 as Punctidae sp. 155)

Endemic Data Deficient

This snail is endemic to western Northland, found only at Panguru. Further survey work is required to establish the abundance and distribution of this species.

3.4.6 Threatened lizard species

Pacific gecko *Hoplodactylus pacificus*

Endemic Gradual Decline

A strictly nocturnal gecko, recorded from Waihou River in this Ecological District.

Northland green gecko *Naultinus grayii*

Endemic Gradual Decline

An arboreal lizard endemic to Northland, recorded from only one site in this Ecological District near Rangipoint Remnants in North Hokianga Harbour. This is the southern limit for this gecko in New Zealand (P. Anderson pers. comm.).

Auckland green gecko *Naultinus e. elegans*

Endemic Gradual Decline

There are unconfirmed reports of this gecko from southern Hokianga, which is close to the northern limit in New Zealand for this species (P. Anderson pers. comm.).

3.4.7 Threatened and regionally significant fish species

Long-finned eel *Anguilla dieffenbachii*

Endemic Gradual Decline

Long-finned eels are found throughout New Zealand, and are threatened by harvest and habitat modification.

Short-jawed kokopu *Galaxias postvectis*

Endemic Gradual Decline

Short-jawed kokopu occurs in some surrounding Ecological Districts (Ahipara, Maungataniwha, Tutamoe, and Puketia) and, as a migratory species, must pass through the Hokianga Ecological District waterways during different lifecycle stages.

Banded kokopu *Galaxias fasciatus*

Endemic Regionally significant species

Occurs throughout Northland, although there is only one record of banded kokopu in this Ecological District (Classens/Duddys Bush).

Giant bully *Gobiomorphus gobioides*

Endemic Regionally significant species

Intermittent distribution around the New Zealand coast and Northland appears to be the stronghold for this species. Recent records in this District are from Pakirikiri Stream in 2001 and Whakarapa Stream in 2000.

3.7 THREATS

The clearance of land for agriculture has resulted in considerable loss of biodiversity. The fragmented nature of surviving habitats has made them vulnerable to stock and weed invasion. Pest plant species such as Mexican devil are found in almost all forest and shrubland areas. Kahili ginger, pampas and lantana are also widespread in the District and the roadsides are particularly infested with a wide range of weed species.

Spartina, an aggressively invasive estuarine grass, is a major threat to the Hokianga Harbour, with extensive infestations at the Wairere, Tapuwae, and Waima River mouths. This plant traps sediments and is replacing indigenous saltmarsh species as well as impeding mangrove regeneration.

In the forest and shrubland areas, livestock, possums, goats, and pigs constitute the main threats to habitat. However, uncontrolled dogs are posing a serious threat to ground-dwelling species, particularly kiwi. Increased settlement brings more domestic animals, e.g. dogs and cats which pose increased problems in these areas (Pierce & Sporle 1998).

Mustelids, and also rodents, are significant predators of bird species. The effect of ferrets as they increase in numbers in the District is a cause for concern due to the impact they are known to have on adult kiwi, whereas stoats kill only juvenile kiwi. (A list of introduced mammals is produced in Appendix 8.5).

Over recent years the population of kukupa in the Far North has been severely depleted, with heavy poaching pressure considered a significant factor, together with predation from rats, possums, and stoats and competition (Pierce & Graham 1995). Although no specific studies have been undertaken in Hokianga Ecological District, it is likely that the findings of Pierce & Graham apply here too.

Habitats on margins or in successional stages are under considerable pressure from deforestation, with several surveyed areas having been cleared since reconnaissance was undertaken. Most of these areas were known kiwi habitat. Regenerating areas are also threatened by the invasion of exotic species, such as gorse, tobacco weed, and pampas.

Coastal vegetation in the District has been greatly diminished, largely by pastoral development. However, if all remaining coastal habitats are protected now, many of the original coastal vegetation types would still be represented.

The physical and/or legal protection of priority areas for protection will go a long way towards safeguarding the habitats/biodiversity of the Ecological District. Additional management will be needed to ensure long-term viability of natural habitats and species populations.

4. Site descriptions

Midpoint grid references are given for contiguous sites. Individual grid references are given for sites containing more than one remnant.

Vegetation types within ecological units describe abundant/dominant and common canopy species. If there is more than one canopy species, and the species are all common within the canopy, they are listed alphabetically.

Where available, the percentage cover of ecological units has been included in the site descriptions.

Records of threatened flora and fauna have been sourced from herbaria and other databases and information systems mentioned in Section 2.1, or were 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. The Fauna section of each site report is focused on significant fauna only. See Appendix 8.4 for fauna lists in the Hokianga Ecological District.

“Not surveyed” is written in the Fauna section of the site descriptions if, at the time of publication, the Department of Conservation, Northland Conservancy did not have any information on significant fauna species.

4.1 LEVEL 1 SITES

SITE NAME	SURVEY NO.	GRID REF.
Herekino Harbour	N05/041	N05 276 580
Eaton Rd Bush	O05/009A	O05 404 627
Mangakotukutuku Stream Forest	O05/016	O05 399 654, O05 402 661, O05 400 666
Otaneroa Stream Remnants	O05/018	O05 382 671, O05 392 670, O05 389 666
Waiotehue Reserve	O05/019	O05 392 662
Pearce Block Remnants	O05/020	O05 377 662, O05 380 660, O05 375 656
Wiseman Block	O05/022	O05 382 650
Upper Uwhiroa Catchment Remnants	O05/023	O05 358 650, O05 355 647, O05 360 640, O05 347 339, O05 363 655, O05 367 651
Central Waiotehue Rd Bush	O05/024	O05 392 641, O05 386 635, O05 389 640
Otaneroa Scenic Reserve	O05/025	O05 393 628
Tongaroa Stream Remnant	O05/030	O05 340 634
Dysart/Powell Rd Bush	O05/032	O05 327 611, O05 317 616, O05 313 611
Upper Herekino River	O05/033	O05 298 602, N05 297 605, N05 301 612
Pauanui Bush	O05/035	O05 325 556, O05 326 547, O05 330 541
Ngatauhe Stream Remnants	O05/037	O05 312 535, O05 310 546, O05 316 546

SITE NAME	SURVEY NO.	GRID REF.
Rotowhenua River Shrubland	O05/037A	O05 320 539
Kohe Bush	O05/045	O05 372 532, O05 368 543
Kohe Stream Remnants	O05/046	O05 351 549, O05 353 547
Awaroa River Rd Remnant	O05/048	O05 369 563
Haumanga Rd Wetland	O05/049	O05 367 584, O05 365 578, O05 361 578
Rotokakahi River & Surrounds	O05/052	O05 399 543
Pareokawa Bush	O05/054	O05 388 578, O05 392 576, O05 394 567, O05 378 567
Mangonuiowae Bush	O05/055	O05 420 563, O05 406 562, O05 413 575, O05 422 574, O05 431 569, O05 437 566
Waiotehue Rd Bush	O05/056	O05 395 604, O05 401 609
Tutaetohia Stream Remnant	O05/059	O05 418 614
Pukemiro Remnants	O05/060	O05 421 588, O05 432 595, O05 434 595
Broadwood Riparian Remnants	O05/061	O05 458 604, O05 378 599, O05 463 598, O05 363 602, O05 466 597, O05 482 597, O05 473 598
Ngatieke Airstrip Bush	O05/066	O05 524 585
Landcorp Paponga Remnants	O05/067	O05 496 574, O05 494 576, O05 495 580, O05 507 579
Humphreys Bush	O05/071	O05 461 555, O05 469 545, O05 473 554, O05 476 553, O05 458 531
Kawaka Stream Remnant	O05/075	O05 417 528
Wharekauere Bush Remnants	O05/087	O05 515 425, O05 526 420, O05 532 431
Te Karaka Point Coastal Forest	O05/089	O05 472 415
Lower Waihou Swamp & Shrubland	O05/090	O05 443 432, O05 455 426
Motuti Coastal Remnants	O05/091	O05 470 445, O05 487 453
Panguru/Pukepoto Shrublands	O05/094	O05 446 451, O05 450 462
Matawera Rd Bush	O05/096	O05 493 462, O05 489 467, O05 486 476, O05 500 472
Tapuwae Scenic Reserve	O05/097	O05 522 467
Tapuwae River Bush	O05/098	O05 522 481
Tapuwae Wetland	O05/099	O05 501 485
Wairupe Forest Remnant	O05/111	O05 559 490
Motukaraka Remnant	O05/112	O05 573 474
Blue Mountain Rd Bush	O05/114	O05 591 493, O05 572 497
Tapuwae Forest & Outliers	O05/115	O05 522 522
Te Karae Station Remnants	O05/116	O05 522 560, O05 525 569
Maungapohatu Bush	O05/117	O05 570 570, O05 562 565
Pukekohe Stream Bush	O05/118	O05 536 535
Paponga-Mata Rd Association	O05/119	O05 548 534, O05 555 545
Pahangahanga Remnant	O05/120	O05 565 539
Mata Rd Intersection Remnant	O05/122	O05 570 555
Te Tio Rd Bush	O05/123	O05 600 535, O05 606 527
Oraoa Stream Saltmarsh	O05/124	O05 570 587
Umawera Bush	O05/125	O05 607 575
Rangiahua Wetland	O05/128	O05 690 552
Whangape Harbour	O05/143	O05 334 534
Waiwhakaruku Bush	O05/146	O05 479 528

SITE NAME	SURVEY NO.	GRID REF.
Orira River Remnants	O05/148	O05 626 546, O05 621 547, O05 637 528, O05 624 525, O05 615 517
Rawhia Remnants	O05/149	O05 659 537, O05 642 521
Hautau Stream Remnant	O05/151	O05 682 544
Hokianga Harbour	O05/152	O05 454 399, O05 559 450
Runaruna Mud Volcano	O05/154	O05 420 546
Herbert Rd Swamp Forest	O05/155	O05 373 526
Reena Bush	O05/156	O05 391 408
Opara Rd QEII Remnant	O05/157	O05 524 402
Northern Mataraua Forest	O06/002	O06 683 337
Waoku Rd Bush	O06/003	O06 663 339, O06 657 331
Classens/Duddys Bush	O06/004	O06 603 399, O06 627 408, O06 508 425, O06 625 414, O06 634 381, O06 619 408
Upokowhawha Forest Remnant	O06/006	O06 550 355
Karangi Bush Remnants	O06/007	O06 558 374, O06 550 372
Vujcich Rd Swamp	O06/008	O06 534 374
Wheoki Stream/Pukemaire Remnants	O06/009	O06 507 393, O06 507 382, O06 498 391, O06 507 388, O06 518 382
Te Hurunga Forest	O06/010	O06 436 375, O06 428 385
Otawhiti Bush	O06/012	O06 490 382, O06 496 385
Waoku Coach Rd Wetlands	O06/032	O06 655 306, O06 648 299
Whawharu Swamp	O06/033	O06 688 372
Hokianga North Head	O06/034	O06 405 355
Coastal Associations		
Rangi Point Remnants	O06/035	O06 447 370, O06 445 380
Araiwhenua Stream Swamp	P06/016	P06 778 296, P06 781 301
Forest Remnants		
Ninihi Rd Swamp & Catchment	P06/020	P06 762 323
Mangatawa Stream Forest Remnants	P06/021	P06 729 346, P06 733 347, P06 727 341, P06 728 349
Mangatawa Bush	P06/022	P06 718 329, P06 703 314
Taumatawhauwhau Forest Outlier	P06/023	P06 746 294
Amazon Rd Forest	P06/027	P06 734 324, P06 736 320, P06 739 317

HEREKINO HARBOUR

Survey no. N05/041
 Survey date 12 December 1994
 Grid reference N05 276 580
 Area 490 ha
 Altitude sea level

Ecological unit

(a) Mangrove forest on estuary



Herekino Harbour N05/041

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

S = shrubland
 F = forest
 W = wetland
 E = estuarine
 D = duneland

- (b) Sea rush saltmarsh on estuary
- (c) Oioi-sea rush saltmarsh on estuary

Landform/geology

Drowned river valley with dune areas bounding the river mouth.

Vegetation

(a) Below the head of the harbour (immediately south of site O05/033 Upper Herekino River Remnants) mangroves with sea rush and saltmarsh ribbonwood occur.

(b) Sea rush is dominant in an extensive saltmarsh. Oioi and pohuehue are present.

(c) Oioi and sea rush with raupo, manuka and saltmarsh ribbonwood also occur.

Further down the harbour, tall mangroves, type (a) occur on either side of the channel with sea rush in places along the landward edge.

In the Puhata Stream, there are lower mangroves, with sand flats, sea rush and pohuehue along the southern edge.

Fauna

The harbour has been incompletely surveyed for fauna. The following bird species have been recorded:

Australasian bittern (Nationally Endangered), Caspian tern (Nationally Vulnerable), white-fronted tern (Gradual Decline), Northern NZ dotterel, banded rail, pied shag, little black shag, and NI fernbird (all Sparse). Variable oystercatcher (Regionally significant species). Other important avifauna includes bar-tailed godwit and lesser knot.

Fish: redfinned bully and inanga recorded in 2001 from Puhata Creek tributary.

Significance

High-quality estuarine habitat supporting many threatened species.

Representative site for all ecological units.

EATON RD BUSH

Survey no.	O05/009A
Survey date	18 November 1994
Grid reference	O05 404 627
Area	67 ha (61 ha forest, 6 ha shrubland)
Altitude	50-150 m asl

Ecological unit

- (a) Taraire-towai forest on hillslope
- (b) Kanuka shrubland on hillslope
- (c) Bracken-ring fern fernland on hillslope
- (d) Towai shrubland on hillslope

Landform/geology

Hillslope on Mangakahia Complex sandstone adjoining Tangihua igneous rocks.

Vegetation

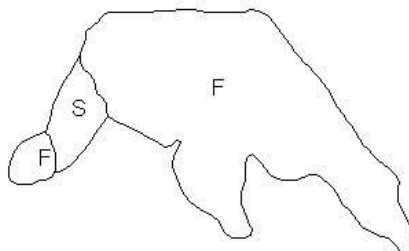
(a) A remnant of taraire and towai forest with frequent totara and occasional puriri, rewarewa, rimu, kahikatea and tawa is linked to Raetea Forest by type (b) kanuka shrubland between 4-6 m tall and type (c) bracken and ring fern fernland.



Eaton Rd Bush O05/009A

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



(d) On the forest edge towai shrubland occurs with occasional kahikatea, mamaku, ponga, five-finger, totara, rewarewa, and pampas.

Fauna

NI brown kiwi (Serious Decline) has been reported at this site.

Significance

An extension of the Maungataniwha Forest tract which lies on Tangihua complex igneous rocks but the site is lying in this Ecological District due to its geological foundation on Mangakahia complex sandstone.

It provides a buffer to the main forest tract and is habitat for kiwi.

Only record of type (c) in the Ecological District.

The Department of Conservation administers 15 ha of this site as Conservation Covenant.

MANGAKOTUKUTUKU STREAM FOREST

Survey no.	O05/016
Survey date	18 November 1994
Grid reference	O05 399 654 O05 402 661 O05 400 666
Area	155 ha (139 ha forest, 16 ha shrubland)
Altitude	60–40 m asl

Ecological unit

- (a) Towai–kanuka/manuka shrubland on hillslope
- (b) Manuka shrubland on hillslope
- (c) Kanuka shrubland on hillslope
- (d) Taraire-towai secondary forest on hillslope
- (e) Kahikatea–taraire forest on hillslope
- (f) Kanuka–totara forest on hillslope
- (g) Kahikatea secondary forest on hillslope

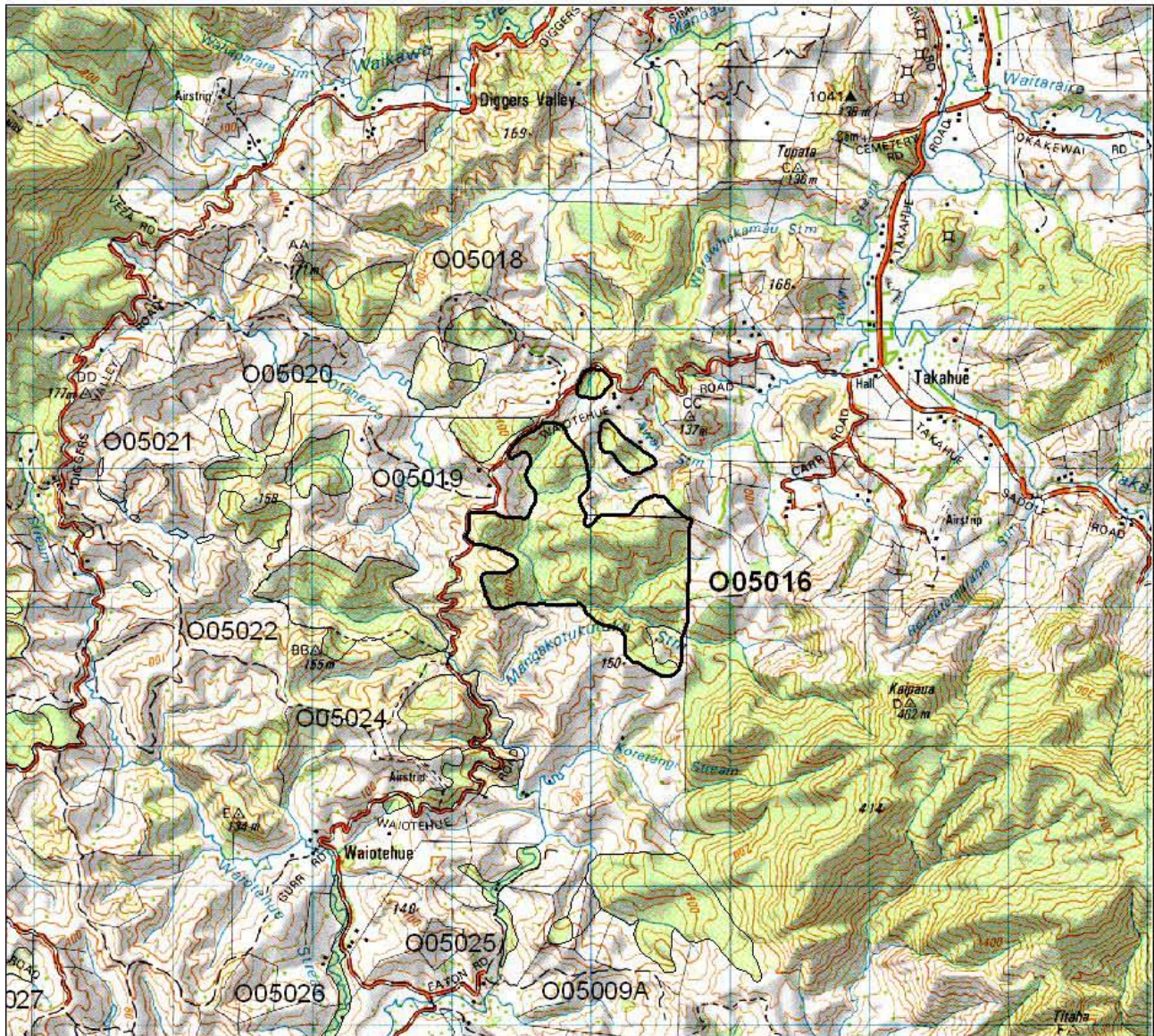
Landform/geology

Dissected hill country of Mangakahia Complex sandstone, including headwaters of some stream catchments.

Vegetation

Much of the area consists of regenerating manuka, kanuka and towai types (a) and (c).

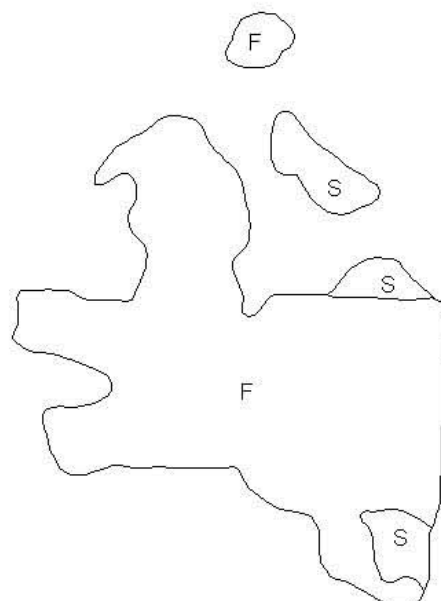
- (a) Towai is abundant with common kanuka/manuka and occasional kahikatea, totara, ti kouka, and ponga. Close to the road the composition of species is similar but is only 4 m high.
- (b) Dominant manuka about 2 m tall, sometimes up to 3 m, but discontinuous with bracken and grass.
- (c) Kanuka is common with frequent towai and occasional kauri, rewarewa, kahikatea, rimu and ti kouka.



Mangakotukutuku Stream Forest O05/016

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



(d) Taraire and towai association (away from the margins) with occasional totara, puriri, tawa, kahikatea, kauri and rimu.

(e) Kahikatea and taraire are common near the road south of the Waiotehue Reserve. Occasional species include pukatea, puriri, rewarewa, towai, totara and rimu. Pukatea is a feature of this particular area. The understorey contains mahoe, pigeonwood, five-finger, pate, rangiora, tree ferns and *Astelia* sp.

(f) Kanuka and totara are common in the northern part with occasional ti kouka, rewarewa, mamaku, and towai.

(g) A small area of secondary kahikatea forest occurs with the occasional pukatea, rimu, rewarewa, towai, taraire and puriri.

Significant flora

Pittosporum virgatum (Sparse) and *Loxosoma cunninghamii* (Regionally significant species).

Fauna

NI brown kiwi (Serious Decline), kukupa (Gradual Decline) and kauri snail (Gradual Decline).

Significance

A large area contiguous with Raetea Forest.

Presence of threatened species of national and regional significance.

Type (a) towai-kanuka/manuka shrubland is unrecorded elsewhere in the Ecological District.

Conservation Covenant of 94 ha, administered by the Department of Conservation protects 60.6% of this site.

OTANEROA STREAM REMNANTS

Survey no.	O05/018
Survey date	20 December 1994
Grid reference	O05 382 671 O05 392 670 O05 389 666
Area	54.9 ha (41.9 ha forest; 13 ha shrubland)
Altitude	60–100 m asl

Ecological unit

(a) Taraire-towai forest on hillslope

(b) Kanuka forest on hillslope

(c) Taraire forest on hillslope

(d) Kahikatea secondary forest in gully and hillslope

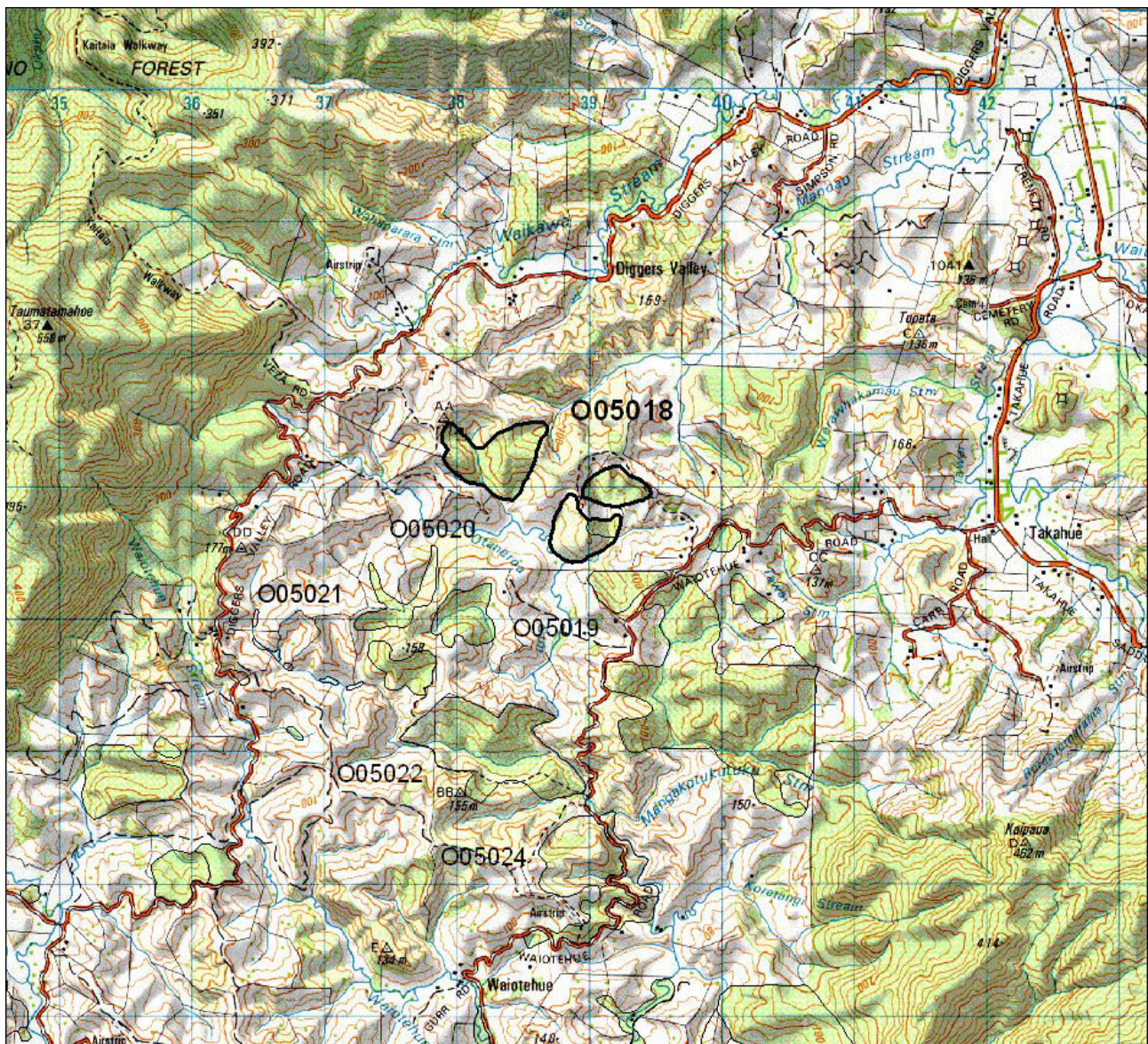
(e) Kanuka shrubland on hillslope

Landform/geology

Dissected hill country on Mangakahia Complex sandstone and siliceous mudstone.

Vegetation

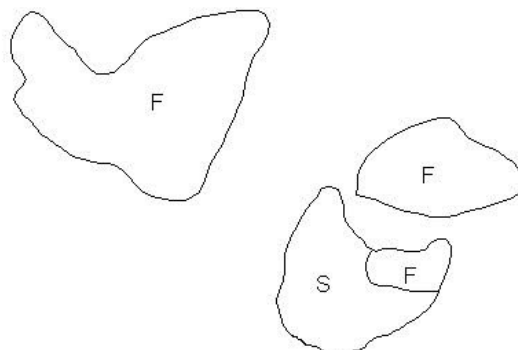
This site consists of three remnants all in close proximity to Herekino and Raetea Forests.



Otaneroa Stream Remnants O05/018

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



(a) Taraire and towai association occurs in the western most areas with puriri and northern rata occurring frequently. Rimu, kahikatea, totara, tawa, pukatea and rewarewa occur with occasional kauri on the ridges. This area was being grazed at the time of survey.

(b) A few hundred metres to the east of type (a), kanuka of varying height is dominant with frequent kahikatea. Puriri, mamaku and ti kouka are occasional.

(c) To the north of type (b) taraire is abundant and towai frequent. Lancewood and white maire also occur. This area is otherwise similar to the first area, except that kauri is absent.

Ponga is abundant in the understorey. Houhere, mahoe, small-leaved milk tree, pigeonwood, kiekie, putaputaweta, mingimingi and several *Coprosma* species are also present, as are most of the common ferns.

(d) Secondary kahikatea forest occurs on the margin of type (b).

(e) Kanuka abundant shrubland (2–4 m tall) occurs in the southernmost remnant with the occasional kahikatea.

Fauna

NI brown kiwi (Serious Decline), kukupa (Gradual Decline) and kauri snail (Gradual Decline).

Significance

A range of vegetation types contributing to a corridor between Herekino and Raetia Forests and habitat for threatened species.

WAIOTEHUE RESERVE

Survey no.	O05/019
Survey date	18 November 1994
Grid reference	O05 392 662
Area	12 ha
Altitude	60–120 m asl

Ecological unit

- (a) Taraire secondary forest on hillslope (25%)
- (b) Kahikatea secondary forest on ridge (20%)
- (c) Kahikatea–towai secondary forest on ridge (20%)
- (d) Kanuka/manuka–kauri forest on ridge (25%)
- (e) Manuka shrubland on ridge (10%)

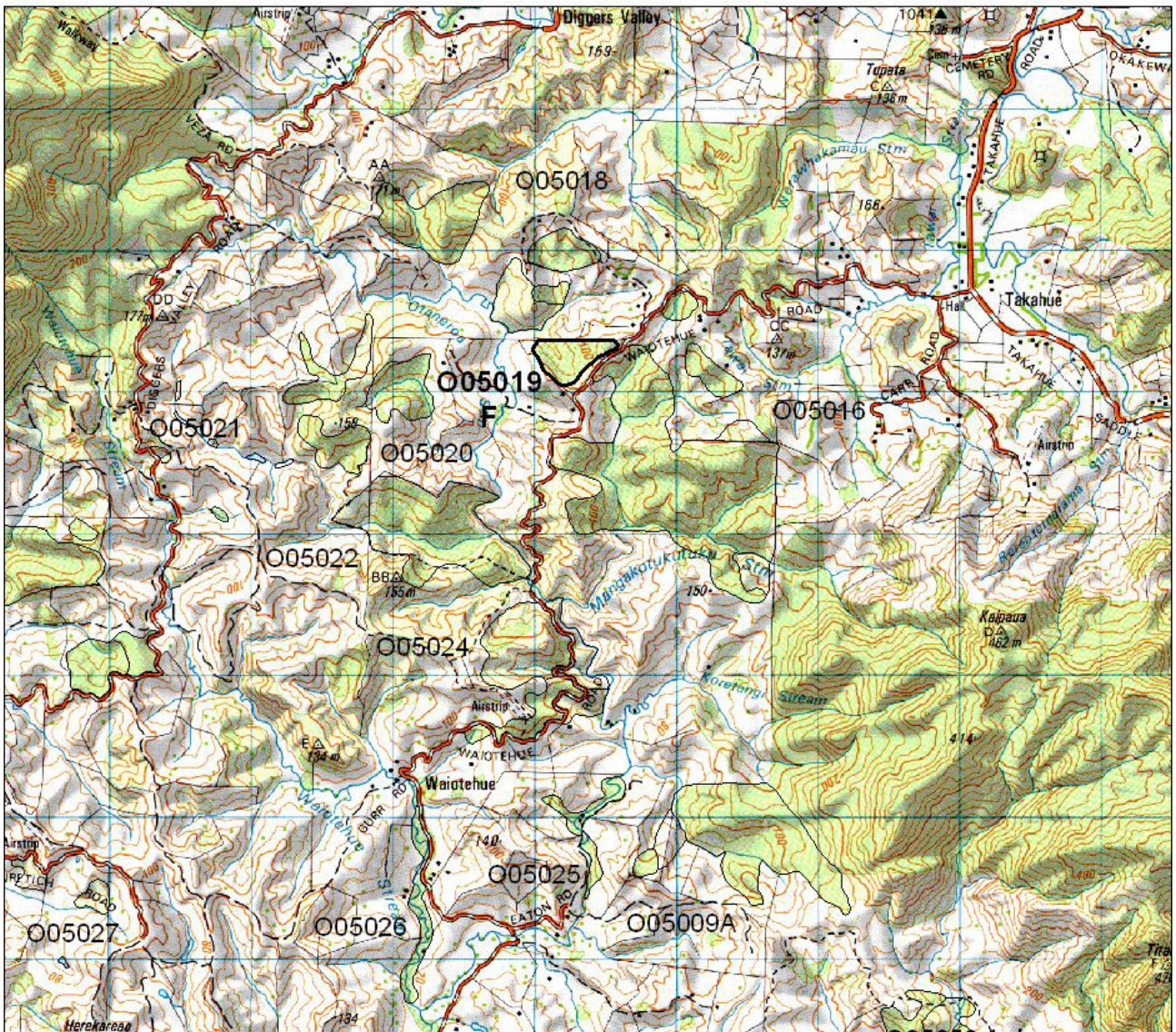
Landform/geology

Dissected hill country on Mangakahia Complex siliceous mudstone.

Vegetation

A mosaic of vigorous secondary growth.

- (a) Abundant taraire with frequent towai and scattered kauri, puriri, rimu, kahikatea, totara, rewarewa, kawaka and pukatea.
- (b) Abundant kahikatea with occasional rewarewa, towai, rimu and mamaku.
- (c) Towai and kahikatea are common with frequent kanuka and occasional puriri, kauri, rimu and totara.



Waiohewu Reserve O05/019

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

(d) Kanuka/manuka and kauri association with frequent rimu.

(e) Manuka shrubland to 6 m in height occurs on the ridge.

Swamp maire, miro, and northern rata are also present within the site.

The sub-canopy contains abundant mamaku, frequent pigeonwood, heketara, *Gabnia* sp. and occasional mapou.

Fauna

NI brown kiwi (Serious Decline), kukupa (Gradual Decline), and kauri snail (Gradual Decline).

Significance

Representative site for vegetation types (a) to (d) showing excellent examples of secondary broadleaf-podocarp-kauri forest types and the only kanuka/manuka-kauri forest, type (d), vegetation type recorded in the Ecological District.

Presence of threatened species.

The Department of Conservation administers 11 ha of Stewardship Land within this site.

PEARCE BLOCK REMNANTS

Survey no.	O05/020
Survey date	20 December 1994
Grid reference	O05 377 662 O05 380 660 O05 375 656
Area	41 ha
Altitude	c. 60–120 m asl

Ecological unit

- (a) Taraire forest on hillslope
- (b) Kahikatea-taraire forest on hillslope
- (c) Kahikatea-puriri forest on hillslope
- (d) Taraire-towai forest on hillslope
- (e) Kanuka-towai forest on hillslope
- (f) Taraire-towai forest on hillslope

Landform/geology

Valley wetlands and ponds in an area of Mangakahia complex sandstone.

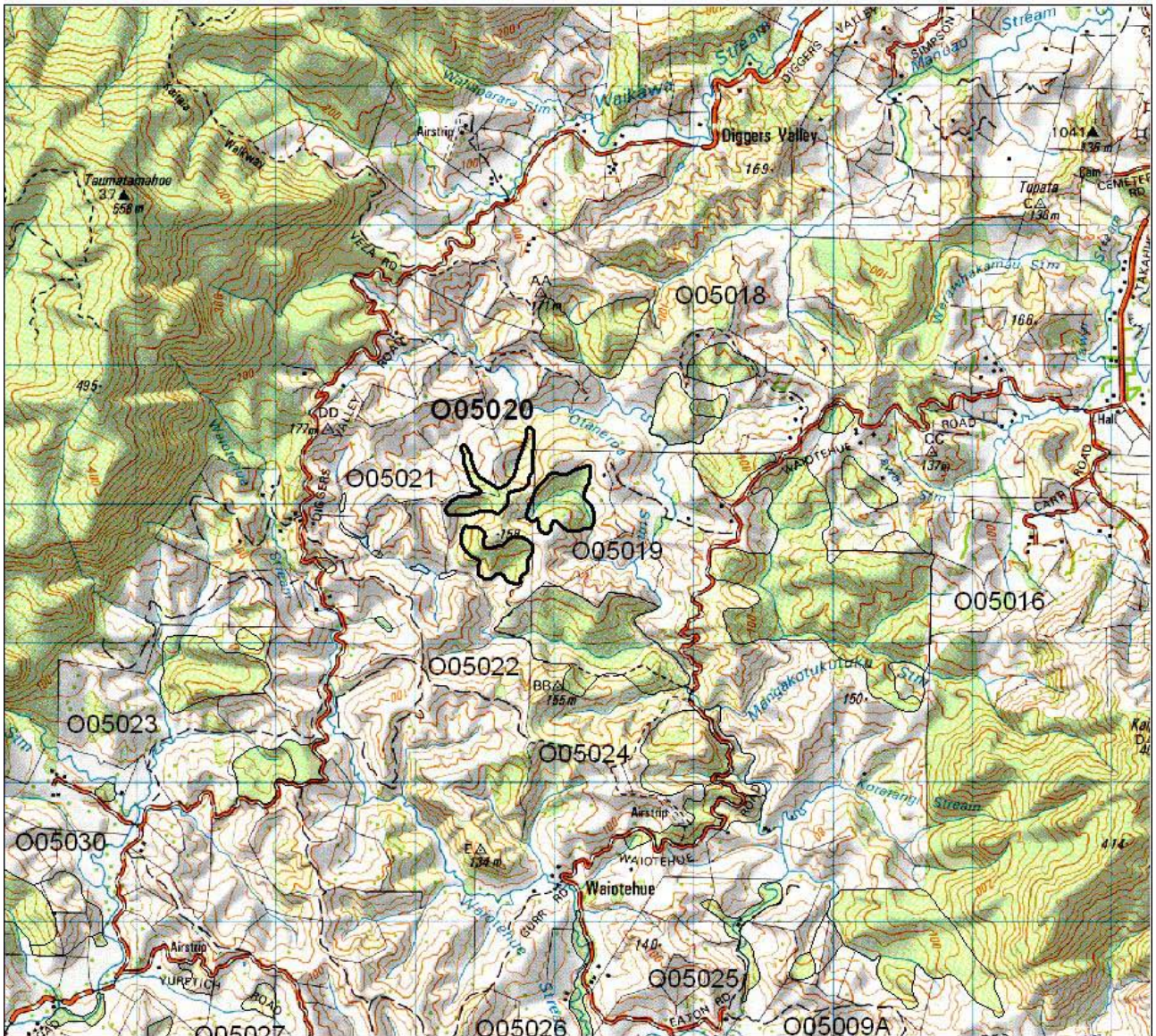
Vegetation

A series of broadleaf-podocarp remnants around which pines have recently been planted (1994–1995).

- (a) The northern block is mostly taraire-dominant with frequent puriri and kahikatea. Also occurring are towai, nikau, mamaku, rewarewa, rimu, pukatea, northern rata and kauri.
- (b) About 5% of the area is kahikatea and taraire forest with occasional nikau, ti kouka, towai and totara.
- (c) The western block is kahikatea and puriri with frequent taraire and occasional nikau, rewarewa, rimu, northern rata, totara and kauri.
- (d) Around 90% of the eastern block is taraire and towai forest with frequent kahikatea and occasional rimu, northern rata, rewarewa, and puriri.
- (e) The remaining area is towai and kanuka with frequent rimu and occasional kauri, northern rata and rewarewa.
- (f) The southern block is taraire and towai with occasional northern rata, puriri, rewarewa, kohekohe, mamaku, rimu, kahikatea, totara and macrocarpa.

Significant flora

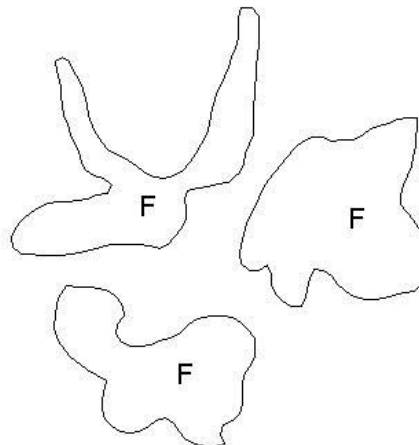
Pittosporum virgatum (Sparse) recorded from this site in 1986.



Pearce Block Remnants O05/020

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



Fauna

Not surveyed by the Department of Conservation. NI brown kiwi (Serious Decline) has been reported from this site.

Significance

Habitat for kiwi.

These are remnants providing potential seasonal food source for kukupa and a corridor between Herekino and Raetia Forests via pine plantations. The remnants may provide a refuge for fauna during plantation harvesting.

Representative site for type (c) kahikatea-puriri forest and the only example of its type recorded in the Ecological District.

A Department of Conservation Conservation Covenant protects 13.8 ha of this site.

WISEMAN BLOCK

Survey no.	O05/022
Survey date	18 November 1994
Grid reference	O05 382 650
Area	61 ha
Altitude	c.50-120 m asl

Ecological unit

- (a) Taraire-towai forest on hillslope
- (b) Kahikatea secondary forest on toeslope
- (c) Raupo reedland in valley bottom

Landform/geology

Dissected hill country on Mangakahia Complex sandstone.

Vegetation

(a) A large area of tall forest in which taraire and towai are common. Scattered throughout are totara, kahikatea, tawa, pukatea, rewarewa, puriri, kauri, miro, nikau and emergent rimu and northern rata.

(b) In lower sites there are pockets of kahikatea. Ponga, nikau, kiekie and kohekohe occur in gullies.

(c) In the valley there is a marshy stream containing raupo, sedges and rushes, with wineberry and kotukutuku.

Fauna

Kukupa and kauri snail (both Gradual Decline). NI brown kiwi (Serious Decline) has been reported at this site.

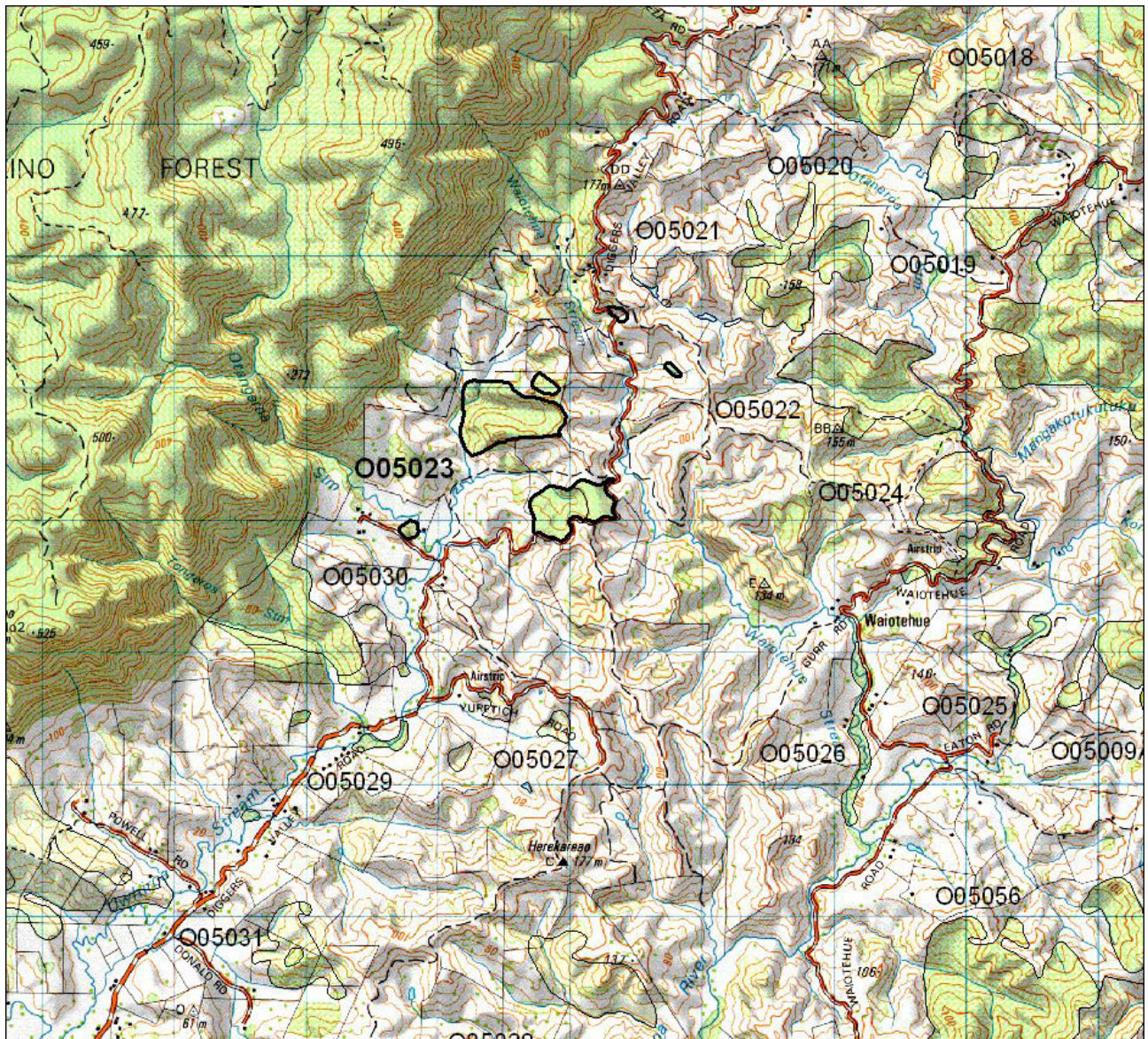
Significance

A large, diverse area with a good range of age classes including emergents.

Presence of three threatened species.

Representative site for type (a) taraire-towai forest.

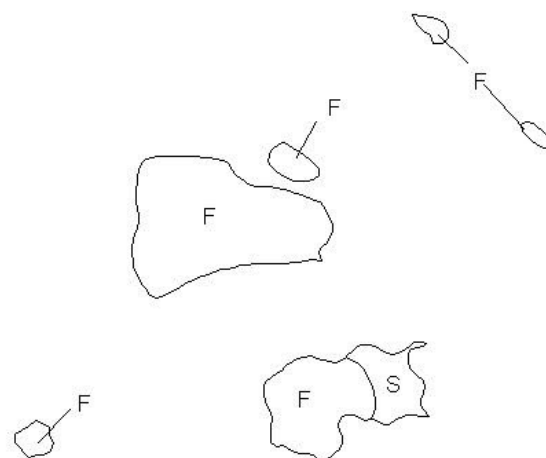
A Department of Conservation Conservation Covenant protects 31.4 ha of this site.



Upper Uwhiroa Catchment Remnants O05/023

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



Ecological unit

- (a) Northern rata-taraire forest on hillslope
- (b) Taraire forest on hillslope
- (c) Manuka-totara-towai forest on hillslope
- (d) Manuka-totara shrubland on hillslope
- (e) Manuka shrubland on hillslope
- (f) Towai shrubland on hillslope
- (g) Kahikatea-taraire forest in gully

Landform/geology

Dissected hill country including headwater catchments on Mangakahia Complex sandstone.

Vegetation

Two main bush areas and four small outlying remnants.

- (a) The largest area of bush consists mainly (80%) of tall northern rata and taraire forest and frequent kahikatea. Other species present are tawa, miro, rewarewa, nikau, mahoe, pigeonwood, towai, rimu, totara, kauri and pukatea.
- (b) In about 10% of this remnant, taraire is common with kauri frequent. Totara, rimu, rewarewa, and kahikatea are occasional.
- (c) Manuka, totara and towai occurs in about 10% of the remnant with occasional mamaku and rewarewa.

Type (b), taraire forest, occurs in about 60% of the southern remnant alongside Diggers Valley Rd. A range of species are occasional including rewarewa, nikau, tawa, rimu, pukatea, puriri, totara, kahikatea, towai, kohekohe, northern rata and epiphytic puka.

A mosaic of regeneration occurs on the northern end of this remnant including:

- (d) Manuka and totara shrubland with frequent towai and occasional ti kouka and rewarewa.
- (e) Manuka shrubland between 3–6 m with scattered mamaku, rewarewa, and pate.
- (f) Further up Diggers Valley Rd, on the opposite side is a fenced area of towai shrubland.
- (g) In a gully to the east is a tiny kahikatea and taraire remnant in which kukupa have been reported to nest.

To the south on the edge of Otangaroa Stream is a very small taraire remnant, type (b), which contains occasional pukatea, rewarewa, towai, kahikatea, totara and kowhai.

Fauna

Kukupa (Gradual Decline) and NI brown kiwi (Serious Decline) has been reported at this site.

Significance

Representative site for type (a) which is unrecorded elsewhere in the Ecological District and type (c). Habitat for threatened species.

A Queen Elizabeth II National Trust covenant protects 31.3 ha in the large northern remnant and 22.7 ha in the main southern remnant.

CENTRAL WAIOTEHUE RD BUSH

Survey no.	O05/024
Survey date	18 November 1994
Grid reference	O05 390 640
Area	51 ha (16 ha forest, 35 ha shrubland)
Altitude	40–120 m asl

Ecological unit

- (a) Manuka shrubland on moderate to steep hillslope
- (b) Kanuka/manuka–ring fern association on moderate to steep hillslope
- (c) Towai shrubland on moderate to steep hillslope
- (d) Kanuka–towai shrubland on moderate to steep hillslope
- (e) Taraire forest on moderate to steep hillslope
- (f) Towai secondary forest on moderate to steep hillslope
- (g) Kahikatea–totara secondary forest on moderate hillslope

Landform/geology

Dissected hill country on Mangakahia Complex sandstone.

Vegetation

A mosaic of regeneration with pockets of broadleaf forest.

- (a) The northern area consists mostly of manuka shrubland between 1–6 m tall with frequent mamaku, towai, and bracken and occasional totara and pampas.
- (b) On the eastern side of the road is low kanuka and manuka with ring fern, bracken is frequent and mamaku occasional.
- (c) Tall towai shrubland also occurs here with frequent ring fern, kanuka, and occasional mamaku and mahoe.
- (d) Dropping steeply from the road, kanuka and towai shrubland occurs with occasional puriri, ti kouka, nikau, wheki, mamaku and rewarewa.
- (e) Taraire with frequent towai also occurs here with scattered pukatea, rewarewa, puriri, kahikatea and tawa.
- (f) Secondary towai with occasional rewarewa, kauri, totara and mamaku also occurs on the western side of the road.
- (g) Across the road a small area of secondary kahikatea and totara occurs with frequent manuka and occasional puriri, towai and pukatea.

Fauna

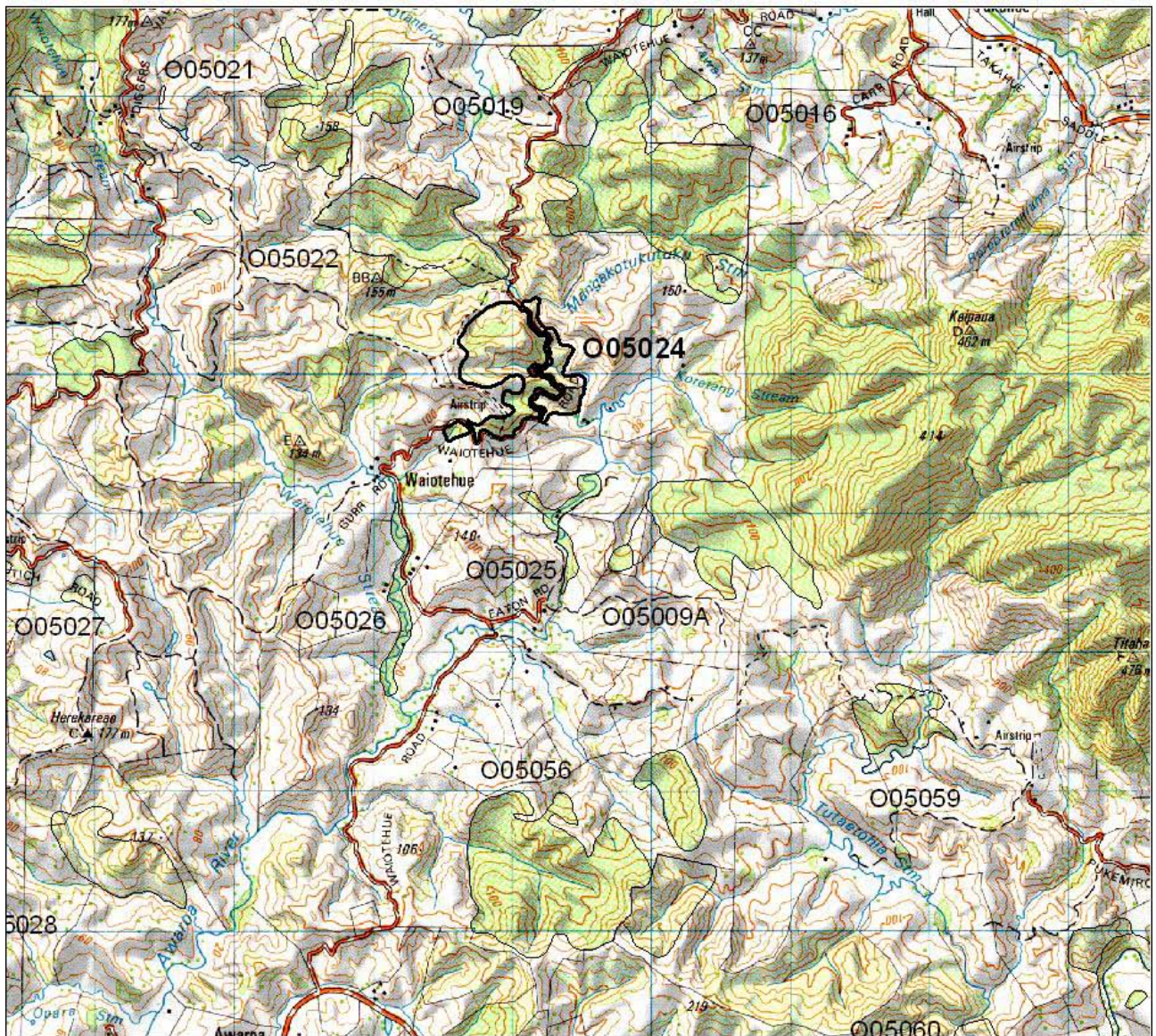
Not surveyed by the Department of Conservation. NI brown kiwi (Serious Decline) has been reported from this site.

Significance

Vegetation on steep areas above streams is providing aquatic habitat protection.

Presence of a threatened species.

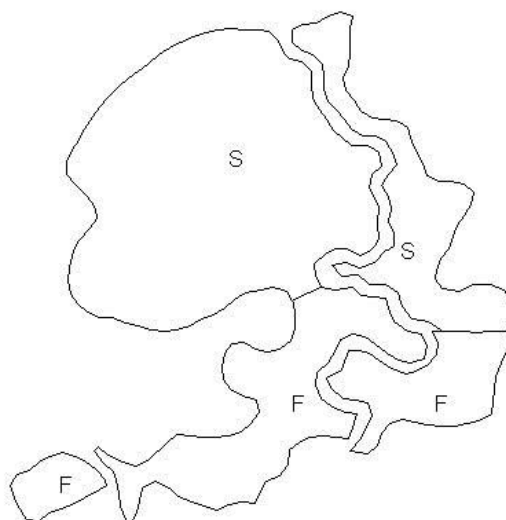
Representative site for type (c) and only record of type (b) and (d) in the Ecological District.



Central Waiohewa Rd Bush O05/024

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

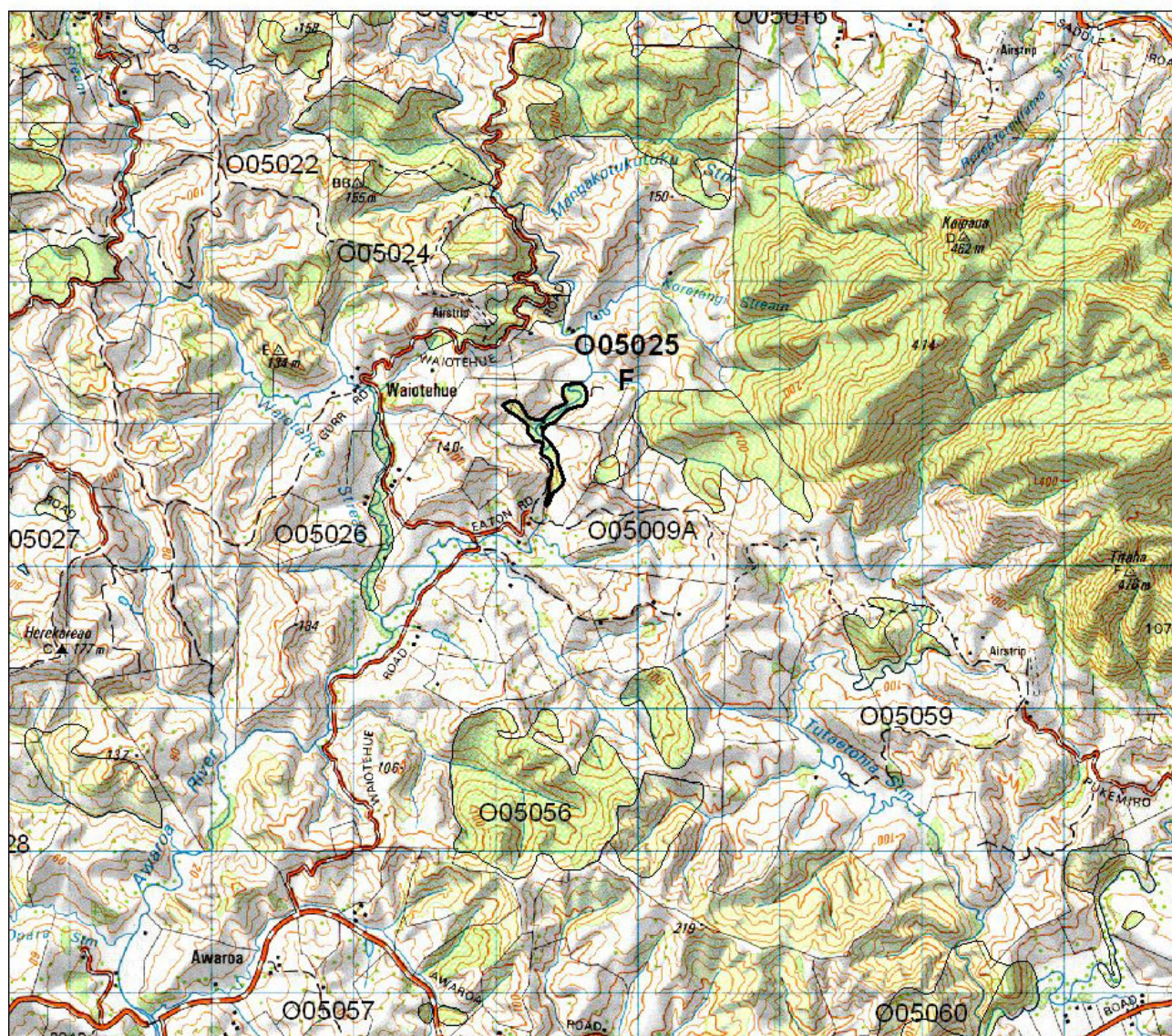


OTANEROA SCENIC RESERVE

Survey no. O05/025
 Survey date 18 November 1994
 Grid reference O05 393 628
 Area 10 ha
 Altitude 20-60 m asl

Ecological unit

(a) Taraire forest on moderate to steep hillslope (95%)



Otaneroa Scenic Reserve O05/025

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

S = shrubland
 F = forest
 W = wetland
 E = estuarine
 D = duneland

(b) Kanuka shrubland on moderate to steep hillslope (5%)

Landform/geology

Alluvial valley flats and dissected hill country on Mangakahia Complex sandstone.

Vegetation

(a) On the steep east bank of the Otaneroa Stream, taraire is abundant and totara and towai frequent. Other species present include kowhai, kahikatea, rimu, tawa, rewarewa, karaka and isolated kauri and northern rata. Titoki, pukatea, toro and miro are also present.

The understorey contains houhere, wheki, and pigeonwood.

(b) Adjoining this is an area of kanuka shrubland between 2–5 m tall containing frequent totara and towai. Rewarewa, mingimingi, karamu, tutu, and koromiko are also present.

Further upstream is another area of taraire, type (a). Titoki, pukatea, towai, totara, kahikatea and rewarewa are also present.

Fauna

Kukupu (Gradual Decline).

Significance

Representative site for type (a), taraire forest. This site provides riparian protection and is a seasonal food source for the threatened kukupu. Two hectares (20% of this site) is administered by the Department of Conservation as a Scenic Reserve.

TONGAROA STREAM REMNANT

Survey no.	O05/030
Survey date	21 November 1994
Grid reference	O05 340 634
Area	66 ha (49 ha forest, 17 ha shrubland)
Altitude	> 20 to 100 m asl

Ecological unit

- (a) Towai forest on hillslope
- (b) Taraire forest on hillslope
- (c) Taraire-towai forest on hillslope
- (d) Manuka shrubland on hillslope
- (e) Manuka-totara-towai forest on hillslope
- (f) Kahikatea secondary forest on toeslope

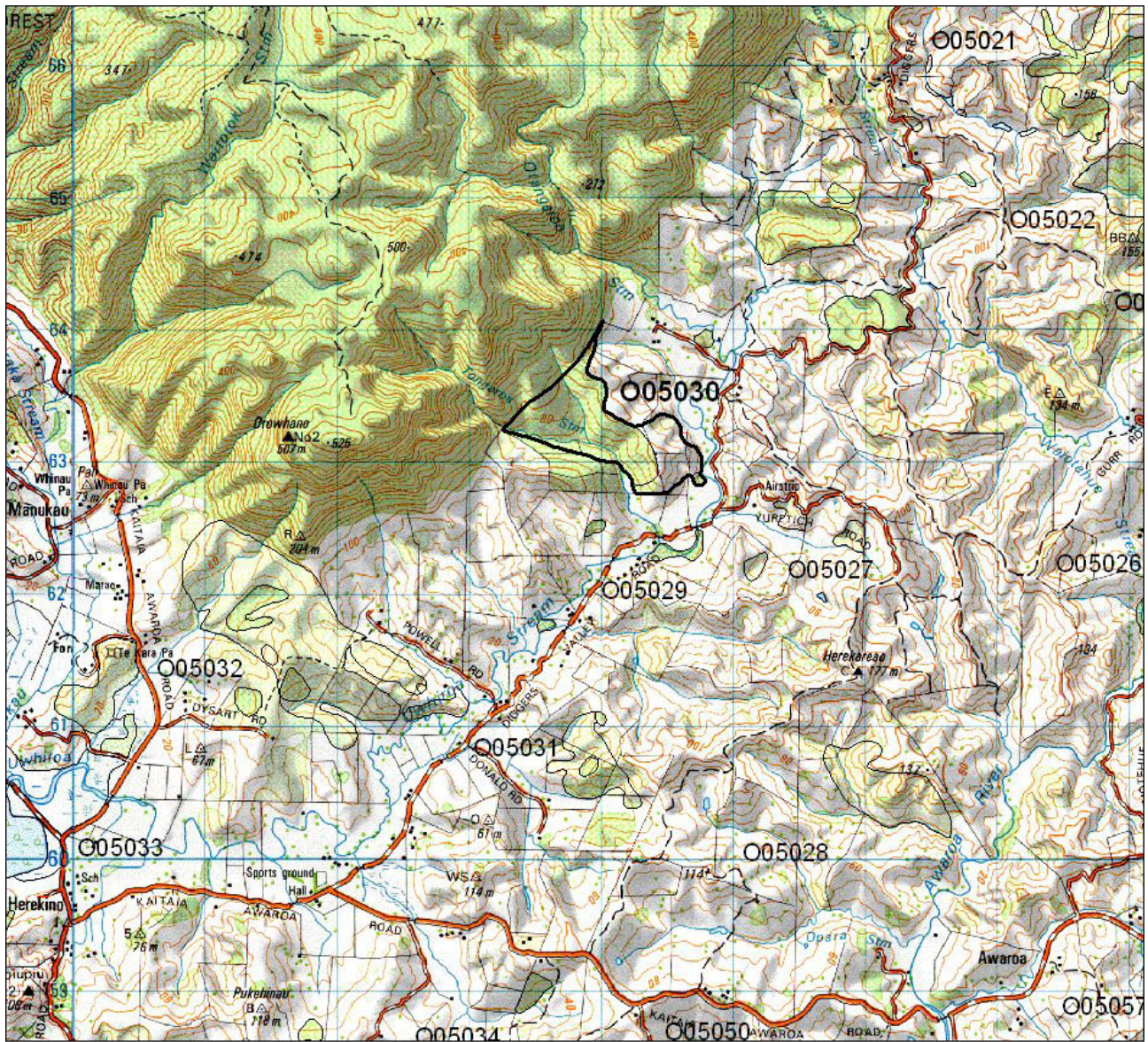
Landform/geology

Landslide of Tangihua Complex material derived from adjoining igneous massif and overlying Mangakahia Complex sandstone.

Vegetation

(a) On the higher slopes of the Tongaroa Stream catchment, towai is dominant with northern rata and taraire. Rewarewa, kauri, kohekohe, puriri, nikau, rimu and kahikatea also occur here.

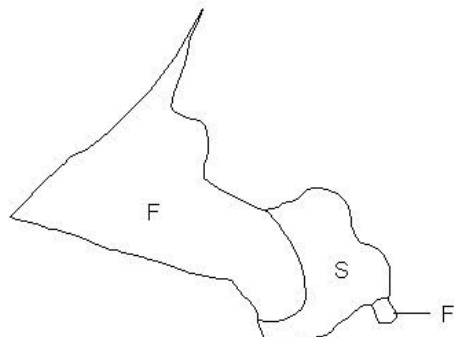
(b) On the lower slopes taraire is dominant. Emergent northern rata and towai are frequent. Rimu, kahikatea and kauri are occasional emergents. Puriri, pukatea, rewarewa and totara also occur.



Tongaroa Stream Remnant O05/030

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



(c) There is also an area of co-dominant taraire and towai with kanuka and northern rata and the occasional rimu and totara.

On the margins the following vegetation types occur:

(d) Low manuka shrubland (2–3 m tall) with totara, ti kouka, mamaku, towai, kahikatea, and wattle.

(e) Manuka, totara and towai forest with the occasional rewarewa and mamaku.

(f) A very small area of secondary kahikatea.

Fauna

NI brown kiwi (Serious Decline) and NI tomtit (Regionally significant species).

Significance

Contiguous with Herekino Forest (Ahipara Ecological District) and as a result sharing many of the values of the greater habitat. The area includes tall forest with emergents and presence of a threatened and regionally significant species.

Representative site for type (a) towai forest and type (c) taraire–towai forest.

DYSART/POWELL RD BUSH

Survey no.	O05/032
Survey date	21 November 1994
Grid reference	O05 327 611, O05 317 616, O05 313 611
Area	144 ha (17 ha forest, 127 ha shrubland)
Altitude	< 20–100 m asl

Ecological unit

(a) Manuka shrubland on hillslope

(b) Kanuka/manuka shrubland on hillslope

(c) Taraire forest in gully

(d) Kahikatea–kanuka secondary forest on hillslope

(e) Kahikatea–totara secondary forest on hillslope

Landform/geology

Dissected hill country on Mangakahia Complex sandstone adjoining the igneous massif of Ahipara Ecological District.

Vegetation

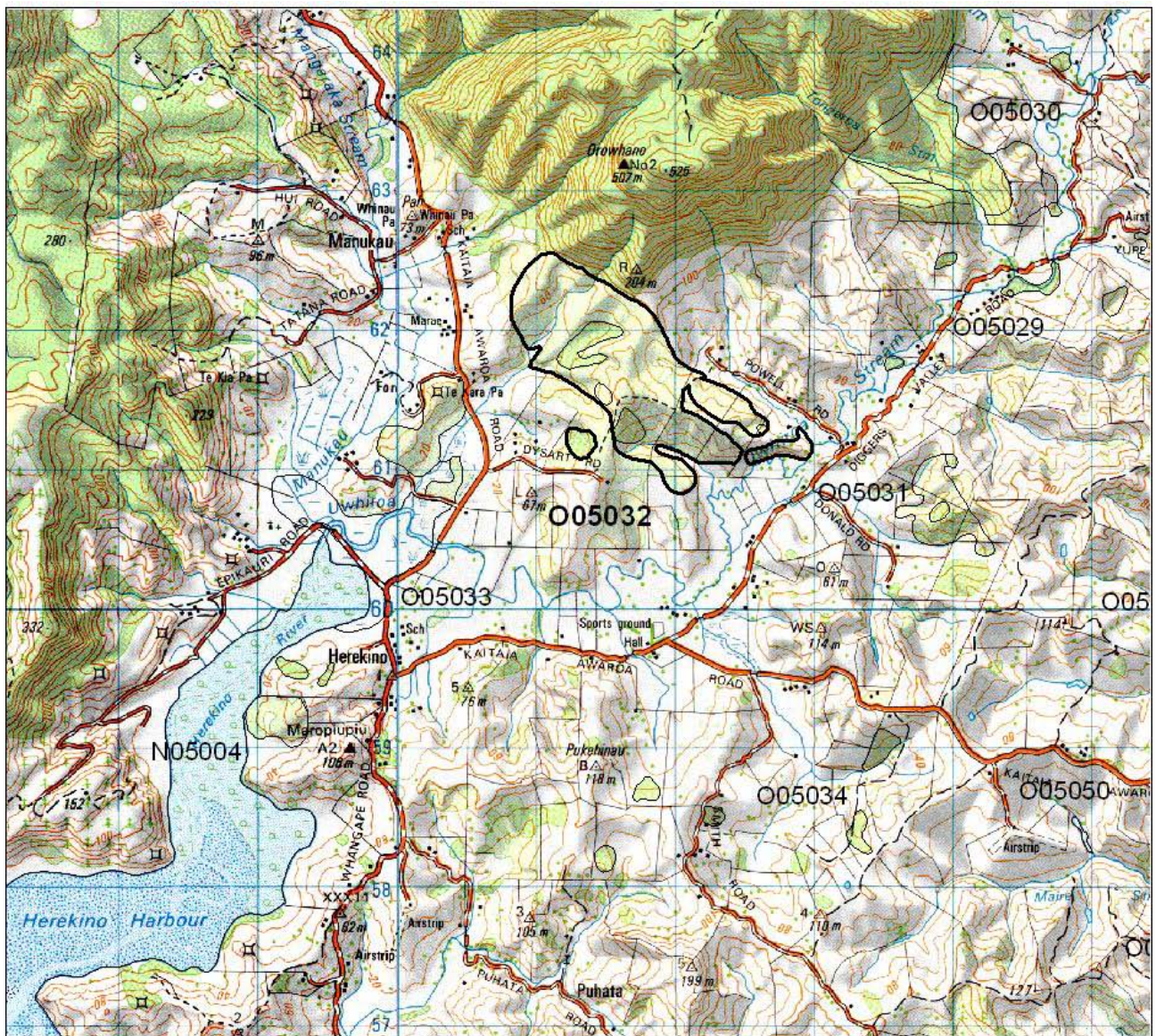
A mosaic of manuka shrubland with pockets of broadleaf and secondary podocarp.

(a) Manuka shrubland mostly 2–4 m tall with occasional mamaku and totara, comprising much of the vegetation on the lower slopes.

(b) Tall kanuka/manuka shrubland occurs at higher altitudes nearer the Herekino Forest and Powell Rd. It also contains totara, kahikatea, kauri, tanekaha, puriri, ti kouka and mamaku.

Above the Uwhiroa Stream there is a similar area which contains kowhai and taraire, but no tanekaha or kauri.

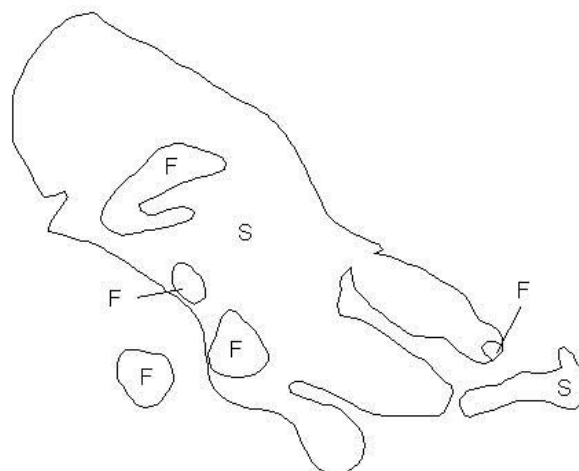
(c) In the southern gully, taraire is common with frequent puriri and kahikatea. Rewarewa, totara and northern rata also occur. To the north, taraire is abundant with scattered northern rata, kahikatea, puriri, kauri, tanekaha and kanuka.



Dysart/Powell Rd Bush O05/032

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



(d) Secondary kahikatea forest with kanuka occurs in pockets in Dysart Rd. Totara, rimu, puriri, rewarewa, kauri, tanekaha, taraire, ti kouka and mamaku also occur.

(e) Secondary kahikatea and totara forest with occasional puriri, titoki and ti kouka occurs in Powell Rd.

Fauna

NI brown kiwi (Serious Decline).

Significance

A large habitat with pockets of secondary podocarp forest. Contiguous with Herekino Forest (Ahipara Ecological District) and a partial sequence from unmodified forest to the upper reaches of Herekino Harbour.

Only one of two sites of type (d) recorded in the Ecological District.

Presence of a threatened species.

Stewardship Land, administered by the Department of Conservation, protects one hectare of this site.

UPPER HEREKINO RIVER

Survey no.	O05/033
Survey date	12 December 1994
Grid reference	N05 297 605, O05 298 602, O05 301 612
Area	81 ha (27 ha shrubland, 54 ha wetland)
Altitude	0–60 m asl

Ecological unit

(a) Harakeke-*Juncus* sp. association on alluvium

(b) Manuka shrubland on alluvium

(c) Raupo reedland on alluvium

(d) Manuka-raupo swamp association on alluvium

(e) Harakeke-saltmarsh ribbonwood swamp association on alluvium

(f) Mamaku-manuka shrubland on gentle hillslope

(g) Manuka-saltmarsh ribbonwood shrubland on alluvium

(h) Giant umbrella sedge-raupo swamp association on alluvium

Landform/geology

Low sandstone ridge and estuarine/alluvial flats.

Vegetation

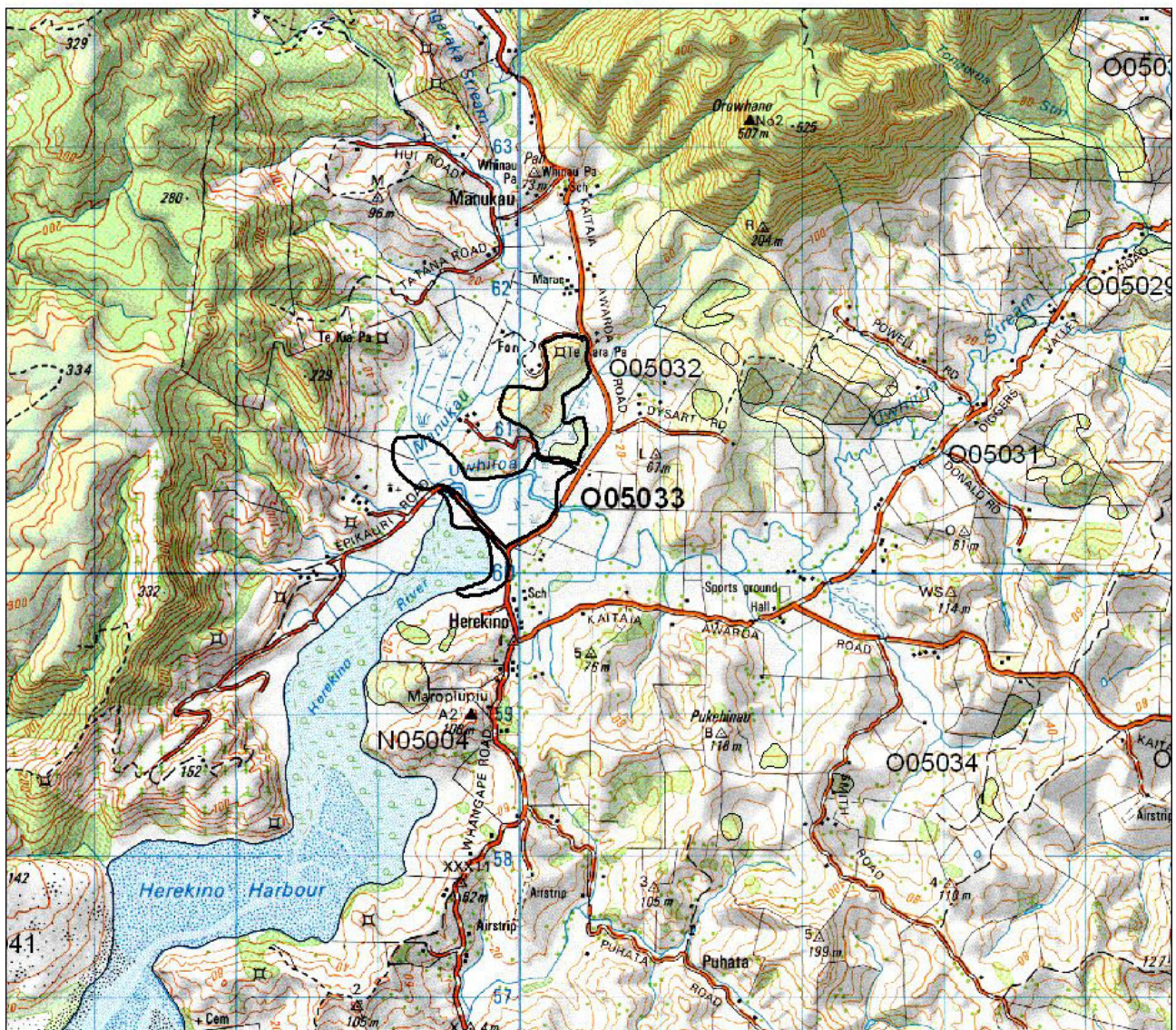
(a) Harakeke and *Juncus* sp. occur where the Uwhiroa Stream joins the Herekino Harbour. Raupo is occasional.

(b) On the margins manuka is abundant with scattered ti kouka, saltmarsh ribbonwood and koromiko.

In the lower reaches of a tributary from Orowhano, is a varied wetland system that originally extended as far as the Kaitaia-Awaroa Rd comprising:

(c) Raupo with scattered harakeke, ti kouka and saltmarsh ribbonwood.

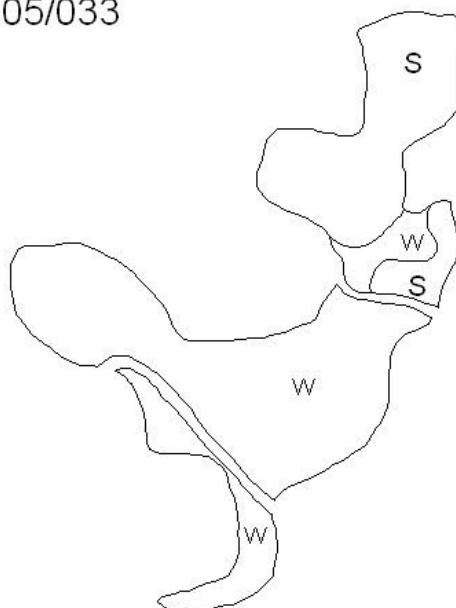
(d) Low manuka with raupo and isolated kahikatea, as well as the species mentioned above.



Upper Herekino River O05/033

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



(e) Harakeke and saltmarsh ribbonwood with frequent raupo and occasional mangrove as the salt interface is reached.

1–2 m tall manuka (type b) occurs on the drier ground.

(f) In the adjoining shrubland, mamaku and manuka are common, with scattered gorse and kahili ginger.

At the Manukau Stream confluence there is:

Type (c), raupo with manuka.

Type (g), manuka and saltmarsh ribbonwood with ti kouka and occasional harakeke.

(h) Along the channel by the Kaitaia–Awaroa Rd Bridge giant umbrella sedge and raupo occur.

On the margins of type (b) manuka shrubland occurs with scattered ti kouka, kahikatea and saltmarsh ribbonwood.

The western side of the area adjoins a larger area of low manuka.

Fauna

Australasian bittern (Nationally Endangered), banded rail, NI fernbird, and spotless crane (all Sparse). NI brown kiwi (Serious Decline) is present in an adjacent habitat and may be present in the shrubland area—survey is needed to confirm this.

Significance

A mosaic of high quality habitat for several threatened species of national significance and representing diverse freshwater/saltwater vegetation types.

Representative site for all ecological units. Types (a), (d), (e), (f) and (g) are unrecorded elsewhere in the Ecological District and only one of two sites of type (h).

Marginal Strip of 2 ha, administered by the Department of Conservation occurs within this site.

PAUANUI BUSH

Survey no.	O05/035
Survey date	1 October 1994, 23 March, 29 September 1995
Grid reference	O05 325 556, O05 326 547, O05 330 541
Area	280 ha (50 ha forest, 230 ha shrubland)
Altitude	0–c. 220 m asl

Ecological unit

(a) Manuka shrubland on ridge and hillslope

(b) Kanuka/manuka shrubland on hillslope

(c) Towai forest in gully

(d) Taraire forest on hillslope and gully

(e) Kahikatea–taraire forest in gully

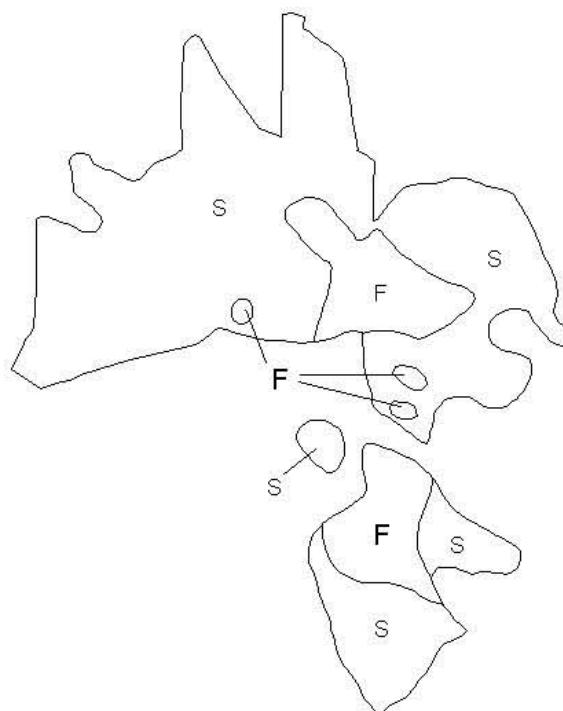
(f) Grass–sedge association on valley flats



Pauanui Bush O05/035

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



Landform/geology

Dissected hill country on Mangakahia Complex sandstone including headwaters and large parts of stream catchments.

Vegetation

An extensive semi-contiguous area of shrubland and broadleaf-podocarp remnants.

(a) Much of the area is regenerating shrubland between 1–8 m tall with scattered ti kouka, mamaku, houhere, totara, puriri and kahikatea. The understorey consists of *Coprosma rhamnoides* and hangehange with *Gabnia setifolia*, tree ferns, kiokio and scattered mistflower. This vegetation type is common on valley sides.

(b) The bulk of the main basin is kanuka/manuka to 8 m tall with an understorey of wheki, ponga, *Coprosma rhamnoides* and hangehange and ground cover of thread fern or the club moss *Lycopodium volubile*.

(c) In the upper gullies towai is dominant with houhere, kohekohe and totara, with an understorey of mamaku, kiekie, taurepo and parataniwha. No environmental weeds were evident here in 1994/95.

(d) On the Puhata side of the trig, taraire occurs with frequent towai and occasional nikau, rewarewa, kahikatea, rimu, puriri, totara and mamangi.

On the Awaroa River side are areas of type (d) taraire forest. Below the trig taraire is abundant and rewarewa, puriri, kahikatea and totara occasional. To the north, nikau, towai, puriri and kahikatea occur frequently.

(e) Over the ridge to the northwest, both taraire and kahikatea are common and puriri frequent.

(f) The valley bottom on the Puhata side consists of narrow, waterlogged grassy flats with *Carex virgata*, kiokio and mistflower.

There are some grassy patches on the ridges, and some stands of exotic plantings at the end of Puhata Rd. Around the trig, the land is reverting and open areas are frequent amongst the low manuka.

Fauna

NI brown kiwi (Serious Decline) and kauri snail (Gradual Decline).

Significance

A large representative area for type (a), (b) and (e), with pockets of bush supporting threatened species.

NGATAUHE STREAM REMNANTS

Survey no.	O05/037
Survey date	23 March 1995
Grid reference	O05 312 535, O05 310 546, O05 316 546
Area	139 ha (5 ha forest, 134 ha shrubland)
Altitude	sea level–140 m asl

Ecological unit

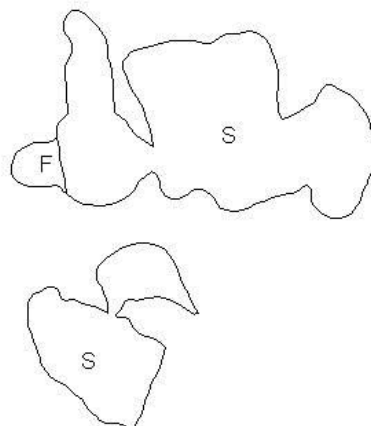
(a) Kahikatea–manuka secondary forest on hillslope



Ngatauhe Stream Remnants O05/037

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



(b) Manuka shrubland on hillslope

Landform/geology

A large proportion of a catchment in dissected hill country on Mangakahia Complex sandstone.

Vegetation

(a) In the Hapumateroto Stream catchment the canopy is open and slips and erosion are apparent. There is a small stand of secondary kahikatea with manuka and occasional puriri, taraire, rimu, rewarewa, northern rata, nikau and ti kouka.

(b) In the neighbouring Ngatauhe Stream catchment the ridges are cleared, and there has been recent (1995) crushing and tracking. At the head of this catchment is a very steep area with low manuka, frequent ti kouka, and harakeke.

Fauna

Not surveyed by the Department of Conservation. NI brown kiwi (Serious Decline) has been reported from this site.

Significance

Catchment protection, and NI brown kiwi habitat.

Only record of type (a) in the Ecological District.

ROTOWHENUA RIVER SHRUBLAND

Survey no.	O05/037A
Survey date	23 March 1995
Grid reference	O05 320 539
Area	5 ha
Altitude	0–20 m asl

Ecological unit

(a) Manuka shrubland on coastal margin

Landform/geology

Gully in Mangakahia Complex sandstone with some estuarine deposits of alluvium.

Vegetation

Along the coastal fringe manuka shrubland occurs with frequent kowhai. This grades into saltmarsh of the Whangape Harbour.

Fauna

Not surveyed.

Significance

Buffer to Whangape Harbour.

Coastal shrubland is a nationally uncommon vegetation type.



Rotowhenua River Shrubland O05/037A

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

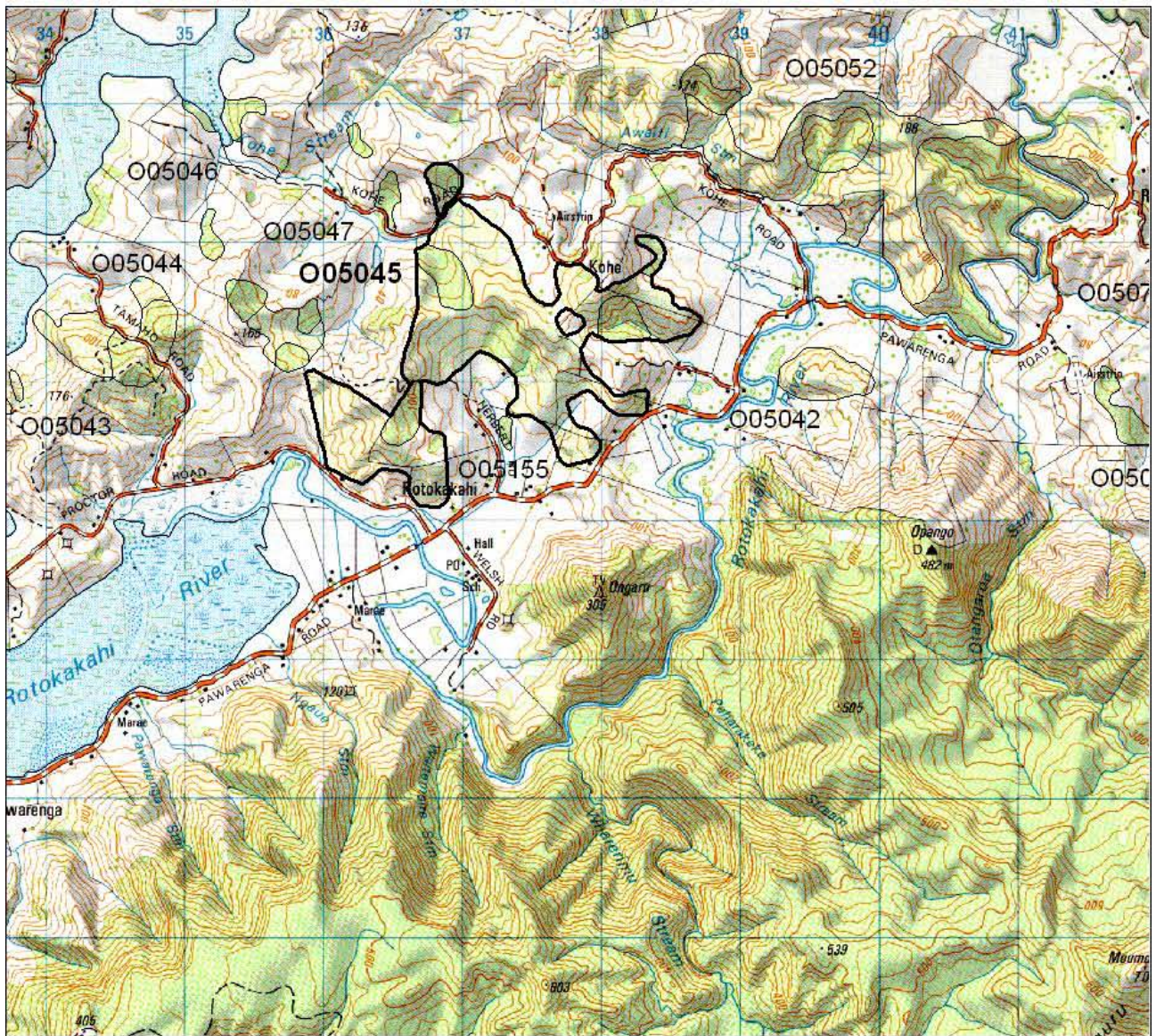
S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

KOHE BUSH

Survey no.	O05/045
Survey date	17 February 1995
Grid reference	O05 372 532, O05 368 543
Area	234 ha (198 ha shrubland, 36 ha forest)
Altitude	20-120 m asl

Ecological unit

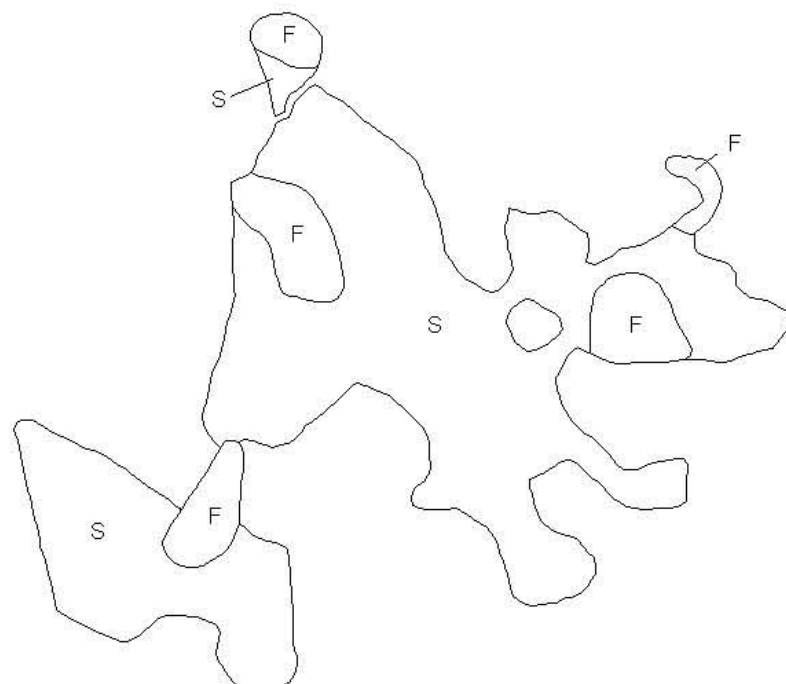
(a) Manuka shrubland on hillslope



Kohe Bush O05/045

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



- (b) Manuka forest on hillslope
- (c) Kahikatea secondary forest on toeslope
- (d) Taraire forest on hillslope
- (e) Manuka-totara forest on hillslope

Landform/geology

A large area extending from hill top downslopes on dissected hill country on Mangakahia Complex sandstone.

Vegetation

A mosaic of shrubland and secondary podocarp with broadleaf remnants.

(a) Manuka shrubland to about 3 m tall comprises much of the area. Other species to be found are rewarewa, totara, kahikatea, puriri, ti kouka, mamaku, towai and tanekaha. Some taller vegetation occurs on the south eastern side which contains frequent tanekaha and occasional towai, mamaku, rewarewa and totara.

East of Herbert Rd, eucalypt and pine stands are growing within the shrubland.

(b) On Kohe Rd, and by the Pawarenga papakainga, the manuka has developed into secondary forest with frequent totara and kahikatea and occasional towai, puriri, rimu, nikau, taraire and kauri.

(c) On the eastern end is an area of secondary kahikatea with frequent totara and occasional puriri and rimu.

(d) Taraire occurs in two areas, on the Herbert property and west of Herbert Rd. Kahikatea and towai are frequent in these areas, with scattered nikau, mamaku, northern rata, rewarewa, puriri, rimu and totara.

(e) Manuka is abundant and totara common alongside type (b). Kahikatea is frequent and puriri and taraire occasional.

Fauna

Not surveyed by the Department of Conservation however NI brown kiwi (Serious Decline) has been reported from this site.

Significance

A large contiguous area with vigorous regeneration and pockets of good quality broadleaf-podocarp forest.

Representative site for type (b) manuka forest.

Habitat for a threatened species.

KOHE STREAM REMNANTS

Survey no.	O05/046
Survey date	17 February 1995
Grid reference	O05 351 549 O05 353 547
Area	11 ha (7 ha forest, 4 ha wetland)
Altitude	0-80 m asl

Ecological unit

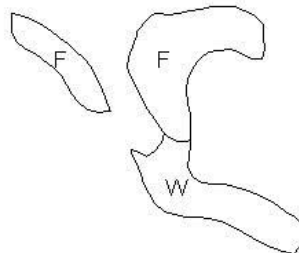
- (a) Manuka forest on hillslope
- (b) Taraire forest on hillslope



Kohe Stream Remnants O05/046

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



- (c) Manuka shrubland on coastal margin
- (d) Raupo-*Juncus* sp. association in brackish zone

Landform/geology

Bush and shrubland on dissected hill country on Mangakahia Complex sandstone adjoining marine/freshwater interface.

Vegetation

(a) On the northern side of the Kohe Stream mouth there is an area of manuka (> 8 m tall) with frequent tanekaha, and occasional totara, puriri, kahikatea, mamaku and ti kouka.

(b) Within type (a) there is a small patch of taraire with scattered puriri, towai, kauri, kahikatea, tanekaha, rewarewa and karaka.

(c) On the land edge adjoining the mangroves is a band of low manuka with occasional tanekaha and kauri.

On the southern bank there is a small area of manuka shrubland with occasional puriri, kahikatea, titoki, kauri and tanekaha.

(d) Beyond the tidal influence, raupo becomes abundant with common *Juncus* sp. and frequent oioi. Manuka, totara and *Coprosma propinqua* occur on the drier areas.

Fauna

NI fernbird (Sparse).

Significance

An uncommon habitat sequence of remnant coastal riparian vegetation and freshwater wetland adjoining high-quality estuarine habitat (Whangape Harbour).

Presence of a threatened species.

Representative site for type (a) and (d).

AWAROA RIVER RD REMNANT

Survey no.	O05/048
Survey date	10 January 1995
Grid reference	O05 369 563
Area	86 ha
Altitude	> 0-c. 100 m asl

Ecological unit

- (a) Kanuka/manuka shrubland on hillslope
- (b) Puriri-taraire forest on hillslope

Landform/geology

A whole catchment of dissected hill country on Mangakahia Complex sandstone.

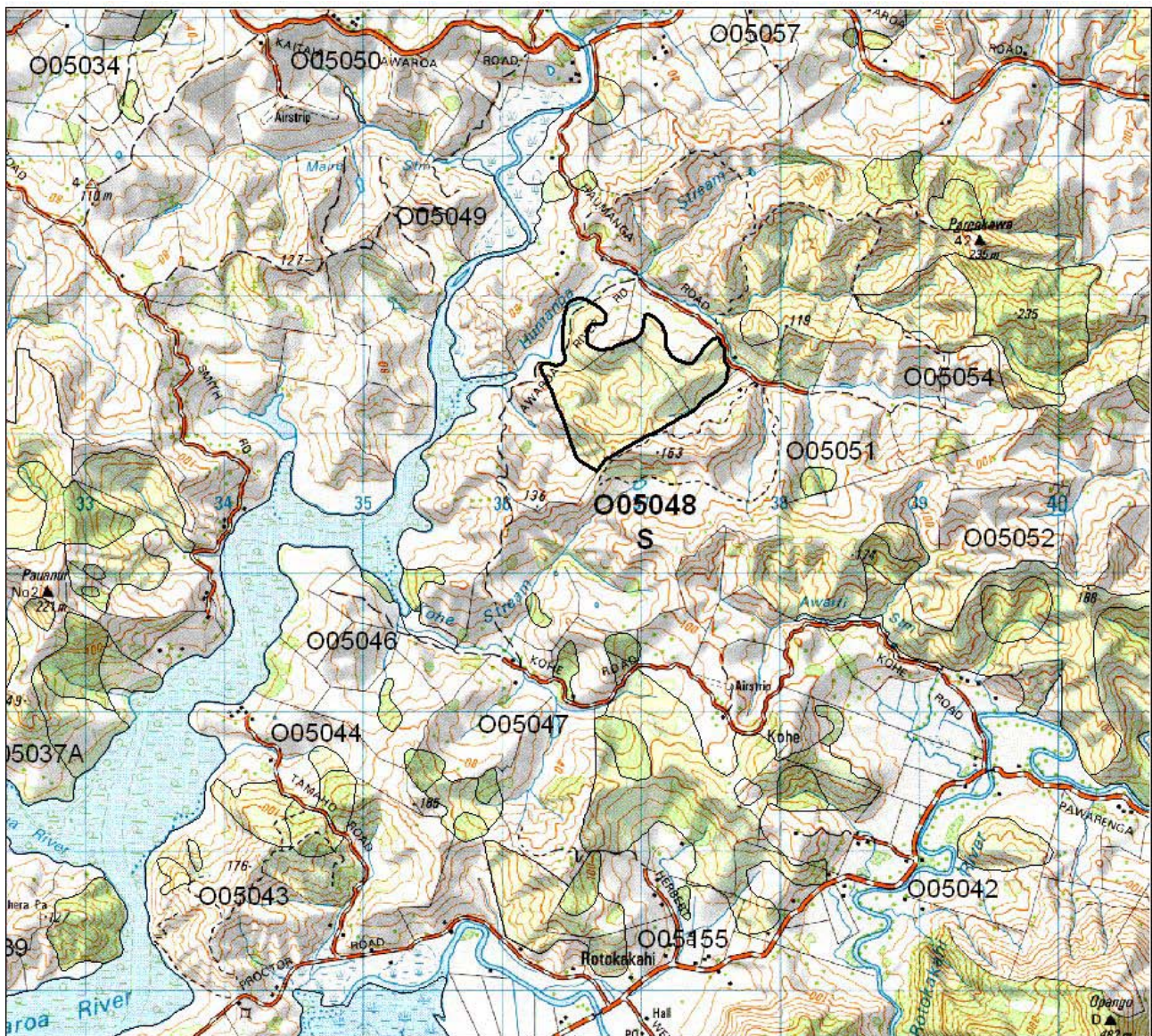
Vegetation

(a) A large area of kanuka/manuka shrubland with occasional kahikatea and totara.

(b) A pocket of puriri and taraire forest occurs with scattered nikau, totara, kauri, tanekaha and totara. The regionally significant *Coprosma parviflora* occurs in the understorey.

Significant flora

Coprosma parviflora (Regionally significant species).



Awaroa River Rd Shrubland O05/048

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

Fauna

Not surveyed by the Department of Conservation, but NI brown kiwi (Serious Decline) has been reported from this site.

Significance

A large area of kanuka/manuka shrubland in the upper Whangape Harbour catchment with water and soil protection functions. Indigenous shrubland areas are important ecosystems for forest succession and can provide important habitat to native plants and animals including threatened and regionally significant species.

In this case, habitat for a threatened and regionally significant species.

HAUMANGA RD WETLAND

Survey no.	O05/049
Survey date	10 January 1995
Grid reference	O05 367 584 O05 365 578 O05 361 578
Area	38 ha (5 ha forest, 7 ha shrubland, 26 ha wetland)
Altitude	0–80 m asl

Ecological unit

- (a) Raupo reedland on alluvium
- (b) Manuka shrubland on alluvium
- (c) Giant umbrella sedge–raupo swamp association on alluvial flat
- (d) *Coprosma propinqua*–manuka–totara shrubland on river bank
- (e) Kanuka forest on hillslope
- (f) Taraire forest on hillslope
- (g) Kanuka/manuka shrubland on hillslope

Landform/geology

Dissected hill country on Mangakahia Complex sandstone running down to alluvial/estuarine wetlands at head of Whangape Harbour.

Vegetation

An area of wetland at the tidal interface, with semi-contiguous dry land vegetation.

- (a) The adjoining saltmarsh grades into raupo with frequent *Juncus* sp. and type (b) low manuka with isolated harakeke, ti kouka and mangrove.
- (c) Giant umbrella sedge and raupo occur along the Awaroa River banks.
- (d) *Coprosma propinqua*, manuka and totara occur between the road and the river bank with frequent harakeke and occasional mapou.
- (e) Adjoining the wetland kanuka with frequent kahikatea and totara occurs. Puriri, ti kouka and kauri are occasional.
- (f) Across the road from type (e), a taraire remnant occurs with frequent kahikatea and puriri. Occasional species include nikau and totara.
- (g) Kanuka and manuka shrubland (4–8 m tall) with frequent tanekaha and totara occurs further up the road. Mamaku, kahikatea, ti kouka, and grass patches are also present.

Fauna

Not surveyed.

Significance

A sequence from saltmarsh to terrestrial vegetation.

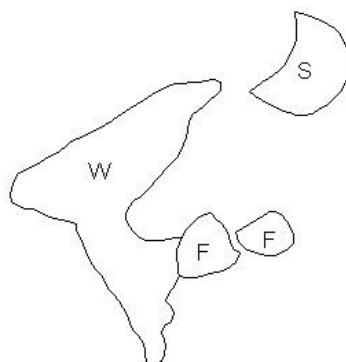
Representative site for vegetation types (a), (b), (c), (d), (e) and (g). Type (d) is unrecorded elsewhere in the Ecological District and it is one of only two sites of type (c).



Haumanga Rd Wetland O05/049

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



ROKOKAKAHI RIVER SCENIC RESERVE & SURROUNDS

Survey no.	O05/052
Survey date	16 January 1995
Grid reference	O05 399 543
Area	250 ha (120 ha forest, 127 ha shrubland, 3 ha wetland)
Altitude	20-190 m asl

Ecological unit

- (a) Kanuka shrubland on steep hillslope
- (b) Kanuka forest on moderate to steep hillslope
- (c) Taraire forest on moderate to steep hillslope
- (d) Mixed broadleaf-podocarp forest on ridge
- (e) Kanuka-totara-towai forest on moderate to steep hillslope
- (f) Manuka shrubland on hillslope
- (g) Towai secondary forest on hillslope
- (h) Taraire-towai secondary forest on hillslope
- (i) Raupo reedland in stream valley

Landform/geology

Stream catchments and hillslopes in dissected hill country bordering the Rotokakahi River on Mangakahia Complex sandstone and adjoining a wetland in the Awaiti Stream valley.

Vegetation

- (a) On the east bank of the river is kanuka shrubland to 6 m tall with frequent towai and mamaku.
- (b) On the edge of the main bush is secondary kanuka forest with occasional towai, rewarewa, rimu and kauri.
- (c) The main forest contains abundant taraire with frequent towai and kanuka. Rimu and northern rata are occasionally emergent and tawa, puriri, kahikatea, karaka, rewarewa and totara are also present.
- (d) There are two small pockets of mixed broadleaf-podocarp vegetation types (< 2% of the site):
 - (i) Frequent rimu, northern rata, tanekaha, kanuka and taraire.
 - (ii) Frequent rimu, northern rata, kauri and occasional towai and totara.

Kawaka occurs rarely.

- (e) Above the river, kanuka is abundant with common towai and totara. Mamaku is frequent with occasional kahikatea, rimu and rewarewa.

In the understorey nikau, kohekohe and mahoe occur over *Asplenium* fern species and filmy ferns.

- (f) North of Kohe Rd is an extensive area of regeneration, from low manuka, to 3-4 m tall containing occasional mamaku, ti kouka, totara, towai and pine.
- (g) Secondary towai with frequent manuka and scattered mamaku and kahikatea also occurs here.
- (h) On the northwestern edge is a small remnant of taraire and towai with occasional rimu, tawa, rewarewa, totara, lancewood and emergent kauri.

(i) Along the Awaiti Stream, adjoining the shrubland, raupo is abundant, with occasional honeysuckle.

On the roadside 2–3 m tall manuka occurs, with mahoe and *Coprosma* spp.

Land upstream has been cleared for forestry (1994/95).

Fauna

Birds: NI brown kiwi (Serious Decline) (in low numbers), kukupa (Gradual Decline) and kauri snail (Gradual Decline).

Fish: short-finned eel and inanga recorded in 2001 from Rotokakahi River.

Significance

A large contiguous area encompassing the Rotokakahi Scenic Reserve exhibiting several different vegetation types, including some unusual associations.

Representative site for type (a), (b), (c) and (d).

The site rises steeply above the Rotokakahi River and Awaiti Stream fulfilling a catchment protection function.

The Rotokakahi Scenic Reserve, 47 ha, is administered by the Department of Conservation.

PAREOKAWA BUSH

Survey no.	O05/054
Survey date	10 January 1995
Grid reference	O05 388 578, O05 392 576, O05 394 567, O05 378 567
Area	132 ha (90 ha forest, 42 ha shrubland)
Altitude	40–235 m asl

Ecological unit

(a) Taraire forest on moderate to steep hillslope

(b) Taraire-towai forest on moderate to steep hillslope

(c) Manuka-towai shrubland on moderate to steep hillslope

Landform/geology

Dissected hill country, on Mangakahia Complex sandstone, including headwaters of some stream catchments.

Vegetation

A large area of forest and shrubland and three small forest areas. Pine plantations occur on the margins.

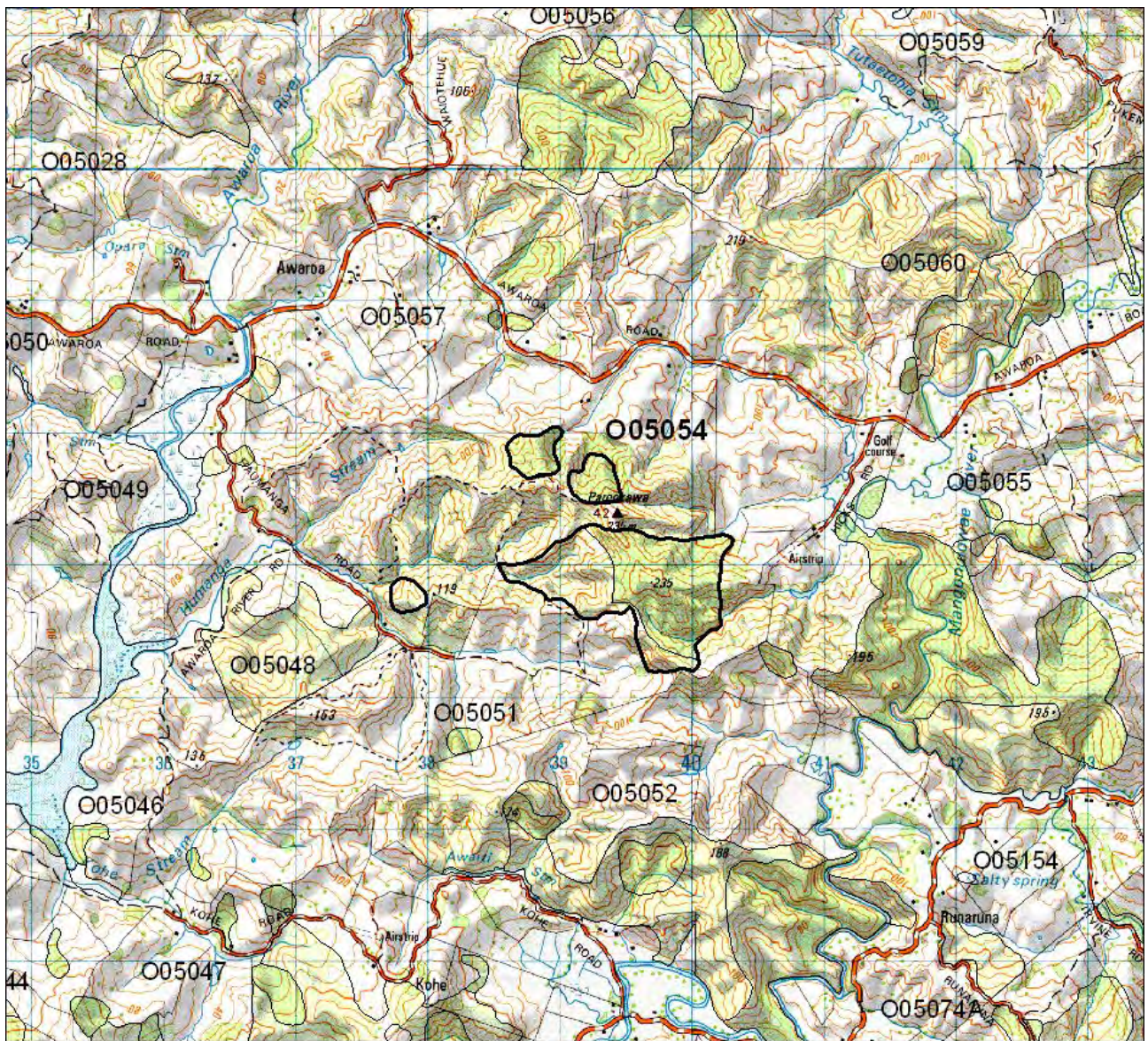
(a) About 5% of the area is tall taraire with frequent kahikatea and occasional emergent rimu.

(b) Taraire and towai are generally common. Rimu and totara are often frequent. Other species occurring are puriri, kahikatea, northern rata, pukatea, rewarewa, and kauri. Rimu and totara are sometimes emergent.

(c) On the southern side is an area of manuka with towai 2–6 m tall. Puriri, rewarewa and mamaku occasionally occur and there are some open patches.

Fauna

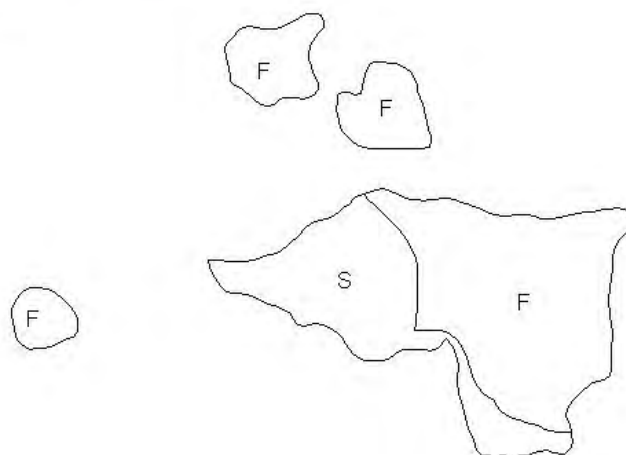
Not surveyed by the Department of Conservation. NI brown kiwi (Serious Decline) has been reported from this site.



Pareokawa Bush O05/054

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



Significance

A large area of tall forest with emergents. Forests with an emergent tier are now rare in the Ecological District. Emergents (generally old mature trees) have been shown to be significant to bird and bat abundance.

Representative site for type (a) taraire forest and type (b) taraire-towai forest in the Ecological District.

Department of Conservation administered Scenic Reserve protects 69 ha (52%) of this site.

MANGONUWAE BUSH

Survey no.	O05/055
Survey date	10 January 1995
Grid reference	O05 420 563, O05 406 562, O05 413 575 O05 422 574, O05 431 569, O05 437 566
Area	322 ha (254 ha forest, 68 ha shrubland)
Altitude	50-195 m asl

Ecological unit

- (a) Kahikatea-taraire-totara forest on alluvium
- (b) Taraire forest on hillslope
- (c) Taraire-towai forest on hillslope
- (d) Manuka shrubland on hillslope
- (e) Kahikatea-manuka-totara treeland in gully
- (f) Totara-kahikatea secondary forest on hillslope
- (g) Secondary totara-towai forest on hillslope

Landform/geology

Hill country on Mangakahia Complex sandstone, including stream catchments and riparian zone alluvial flats near Hicks Rd.

Vegetation

One large forest and shrubland with five small outlying remnants.

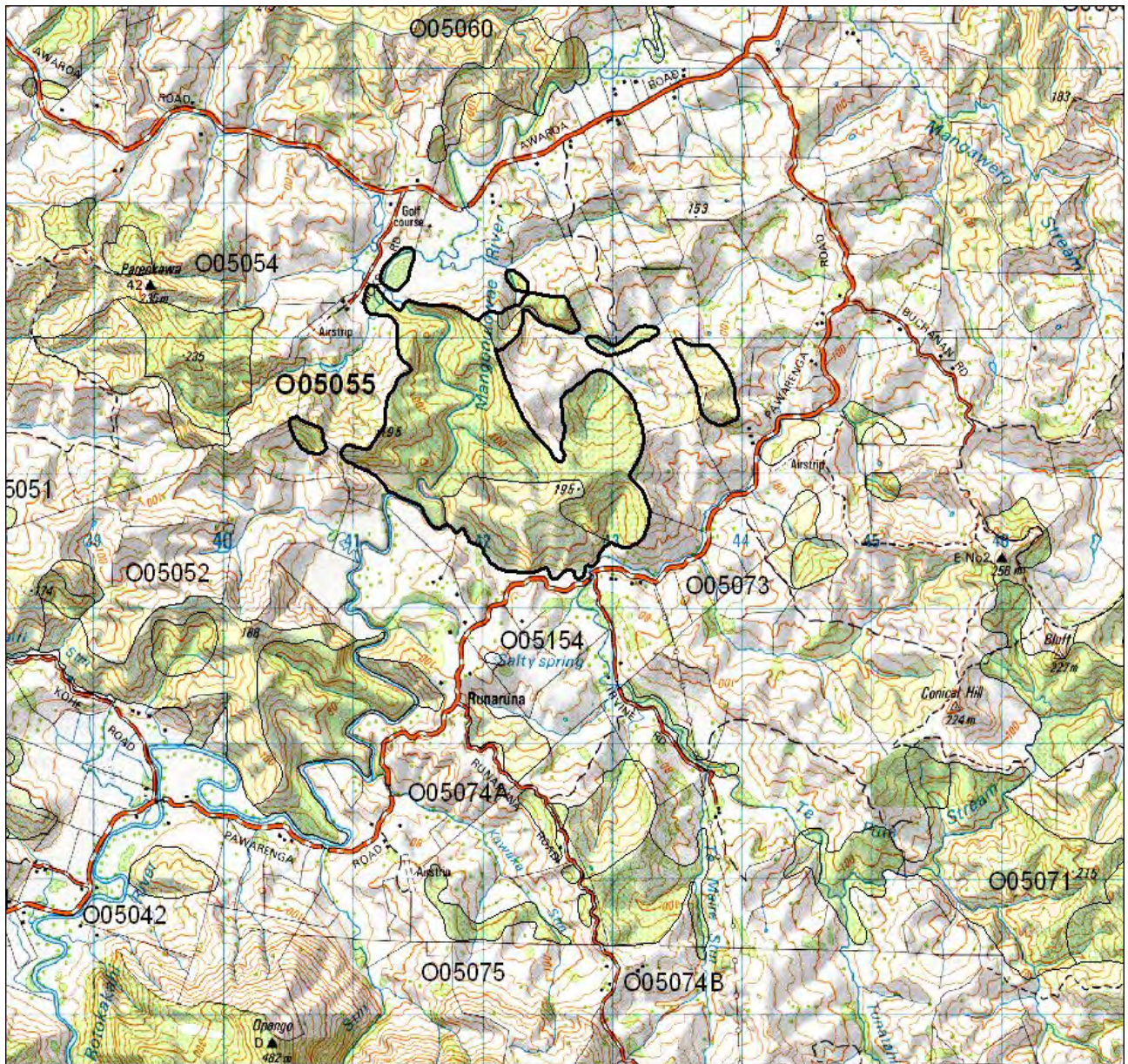
(a) On the edge of the Broadwood Golf Course, kahikatea, taraire and totara are common. Kowhai, rewarewa, titoki and pukatea occur occasionally.

(b) Further up the ridge, taraire is abundant with frequent totara and kanuka. Kahikatea, rimu, nikau, towai, rewarewa and ti kouka also occur. The Mangonuiwae River runs through this area, with many weeds along the river bank.

In the understorey ponga, *Adiantum* sp., *Blechnum fraseri*, and *Coprosma spathulata* are abundant with mingimingi and mapou occurring frequently with kiekie, mamangi, *Alseuosmia* sp., nikau, *Gabnia* sp., heketara and occasional putaputaweta, hangehange, small-leaved milk tree and pigeonwood.

To the east is an outlier of abundant taraire (type b) with frequent kahikatea, and occasional rimu, rewarewa, puriri, totara, nikau and northern rata.

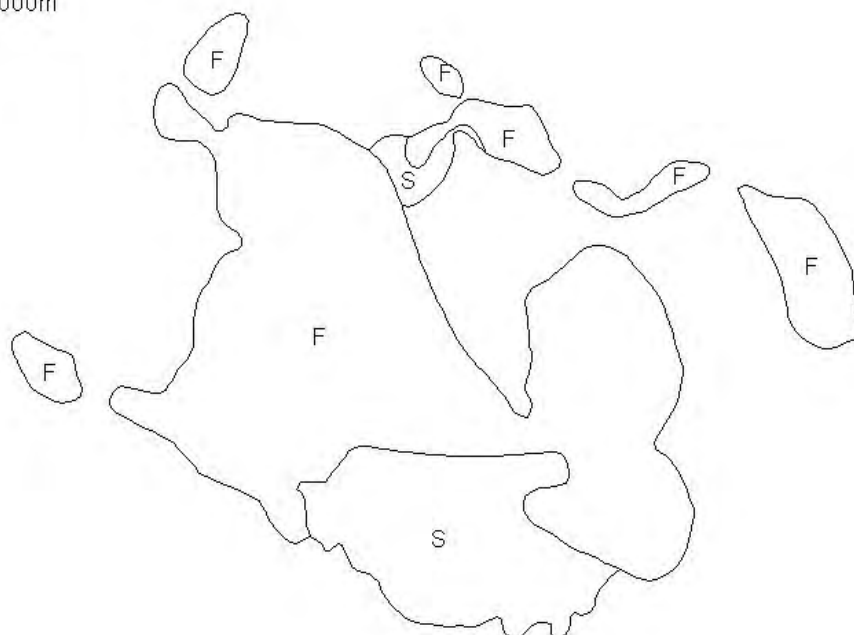
(c) Taraire and towai are common and kahikatea frequent on the eastern side. Rewarewa, nikau, totara and emergent rimu and northern rata occur occasionally.



Mangonuiowae Bush O05/055

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



(d) To the south is an extensive area of tall manuka shrubland with frequent totara and towai. Rewarewa, kahikatea and mamaku occur occasionally.

(e) A gully of abundant kahikatea with common manuka and totara runs west to join another outlying area to the north of type (b) taraire forest with towai and kahikatea and type (f) kahikatea-totara with frequent taraire. This latter area contains kawaka.

(g) To the southwest (over the ridge) is an area of secondary totara and towai with kahikatea and manuka.

Significant flora

Olearia albida (Regionally significant species).

Fauna

NI brown kiwi (Serious Decline), kukupa (Gradual Decline) and kauri snail (Gradual Decline).

Significance

Large and diverse site including forested riparian areas. Presence of three threatened species and the regionally significant *Olearia albida* occurs away from a coastal influence.

Representative site for type (a) kahikatea-taraire-totara forest which is one of only two sites recorded in the District and the only example on alluvium, type (b) taraire forest, type (c) taraire-towai forest and type (d) manuka shrubland. Government Purpose Reserve of 123 ha and 1 ha of Stewardship Land, both administered by the Department of Conservation, protects 38.5% of this site.

WAIOTEHUE RD BUSH

Survey no.	O05/056
Survey date	18 November 1994
Grid reference	O05 395 604, O05 401 609
Area	157 ha (129 ha forest, 28 ha shrubland)
Altitude	30–140 m asl

Ecological unit

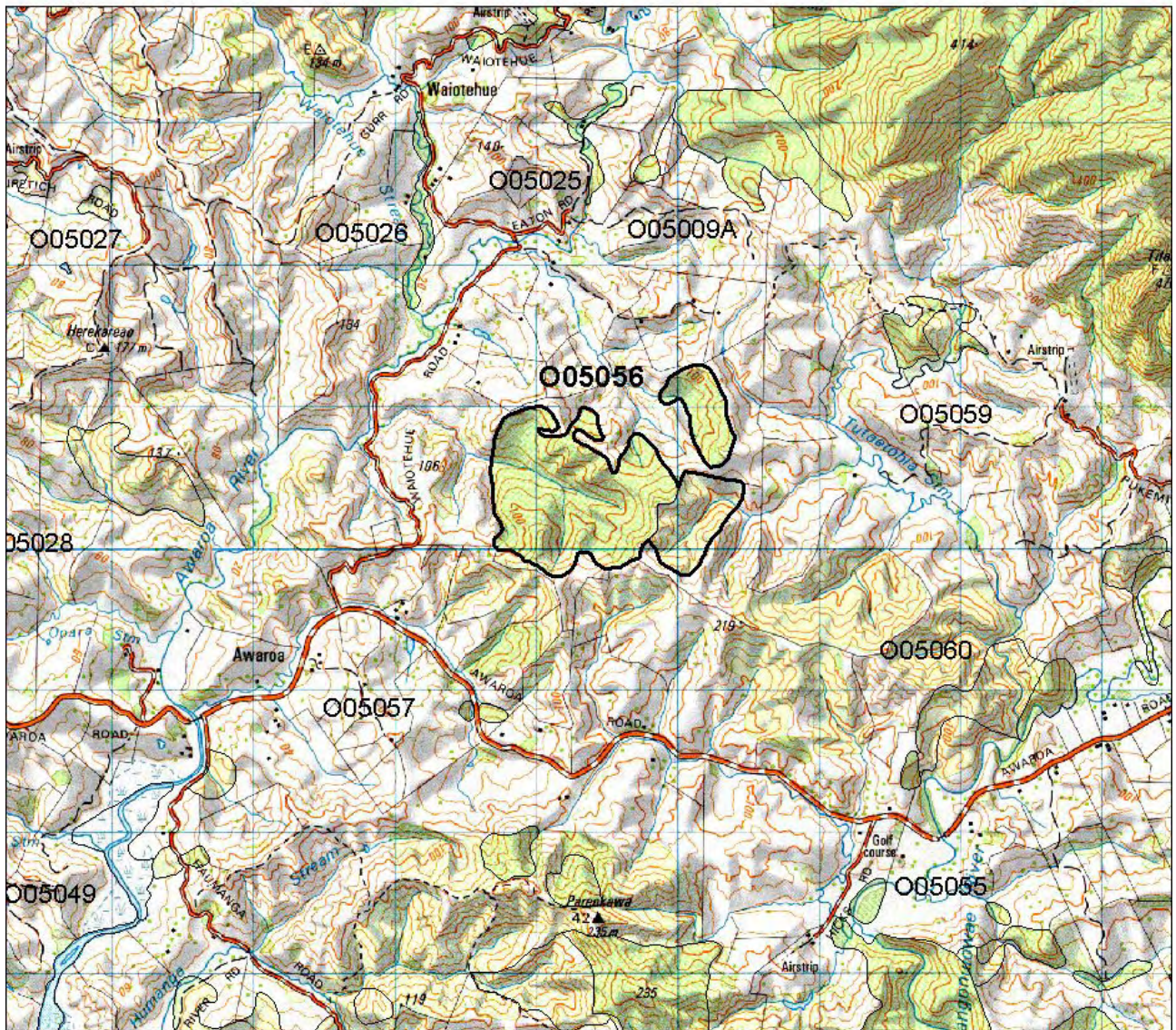
- (a) Taraire forest on hillslope
- (b) Kanuka-totara forest on hillslope
- (c) Kanuka/manuka shrubland on hillslope
- (d) Manuka shrubland on hillslope
- (e) Taraire-towai forest on hillslope

Landform/geology

Headwater catchments on dissected hill country on Mangakahia Complex sandstone.

Vegetation

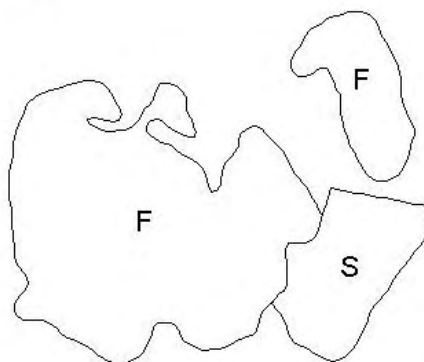
- (a) Half of the main area is taraire-dominant with scattered totara, puriri, kahikatea, towai and rimu.
- (b) The other half is divided between secondary kanuka and totara with frequent towai and occasional rimu, kahikatea and puriri, and type (c) 3–4 m tall kanuka/manuka shrubland.



Waiohewa Rd Bush O05/056

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



- (d) Over the ridge is a large area of low manuka shrubland with isolated puriri.
- (e) The northern remnant which is almost contiguous contains taraire and towai forest with frequent kahikatea. Puriri, rewarewa, and emergent rimu and northern rata are occasional.

Fauna

Kukupa (Gradual Decline). NI brown kiwi (Serious Decline) has been reported at this site.

Significance

Large semi-contiguous area which provides habitat for threatened species and is a potential linkage between Raetea Forest via pine plantations to Pareokawa and Mangonuiowae.

TUTAETOHIA STREAM REMNANT

Survey no.	O05/059
Survey date	16 January 1995
Grid reference	O05 418 614
Area	25 ha (10.5 ha forest, 14.5 ha shrubland)
Altitude	80–160 m asl

Ecological unit

- (a) Manuka–towai shrubland on hillslope
- (b) Puriri–taraire forest on hillslope

Landform/geology

Dissected hill country on Mangakahia Complex siliceous mudstone (Ngatituri) on the lower hillslopes and Mangakahia Complex sandstone on the upper hillslopes with alluvium in the valley floor.

Vegetation

- (a) About half of the area is manuka and towai shrubland varying between 3–8 m in height, in which rewarewa, kahikatea, rimu and totara occur occasionally.
- (b) On the southern side puriri and taraire occur with frequent kahikatea and rare emergent rimu and northern rata.

Fauna

Kauri snail (Gradual Decline) and likely presence of NI brown kiwi (Serious Decline).

Significance

Partial linkage between Warawara and Raetea Forests. An important refuge as the surrounding land becomes developed by plantation forestry.

Presence of a threatened species and likely to support kiwi.

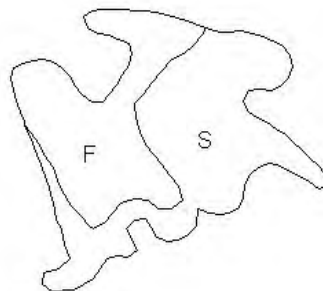
Representative site for type (a), manuka–towai shrubland, which is one of the best examples of its type in the Ecological District.



Tutaetohia Stream Remnant O05/059

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



PUKEMIRO REMNANTS

Survey no.	O05/060
Survey date	16 January 1995
Grid reference	O05 421 588, O05 432 595, O05 434 595
Area	71 ha (26 ha forest, 45 ha shrubland)
Altitude	60–160 m asl

Ecological unit

- (a) Manuka shrubland on hillslope
- (b) Taraire forest on alluvium
- (c) Kanuka-rimu forest on gentle hillslope

Landform/geology

Valley alluvial flats and hill slope on Mangakahia Complex sandstone.

Vegetation

- (a) A hillside of 3–4 m tall manuka shrubland with frequent mamaku and occasional totara, towai and pine adjoins broadleaf-podocarp forest on the river flats.
- (b) Taraire is common and totara and kahikatea frequent. Puriri, kowhai, rewarewa, pukatea, willow, poplar and emergent northern rata are present. Downstream, another lowland remnant occurs, in which taraire is abundant, type (b), and rimu, towai, puriri, kahikatea and mamaku occur occasionally.
- (c) There is also a small outlying remnant of secondary kanuka and rimu with occasional totara and kahikatea.

Fauna

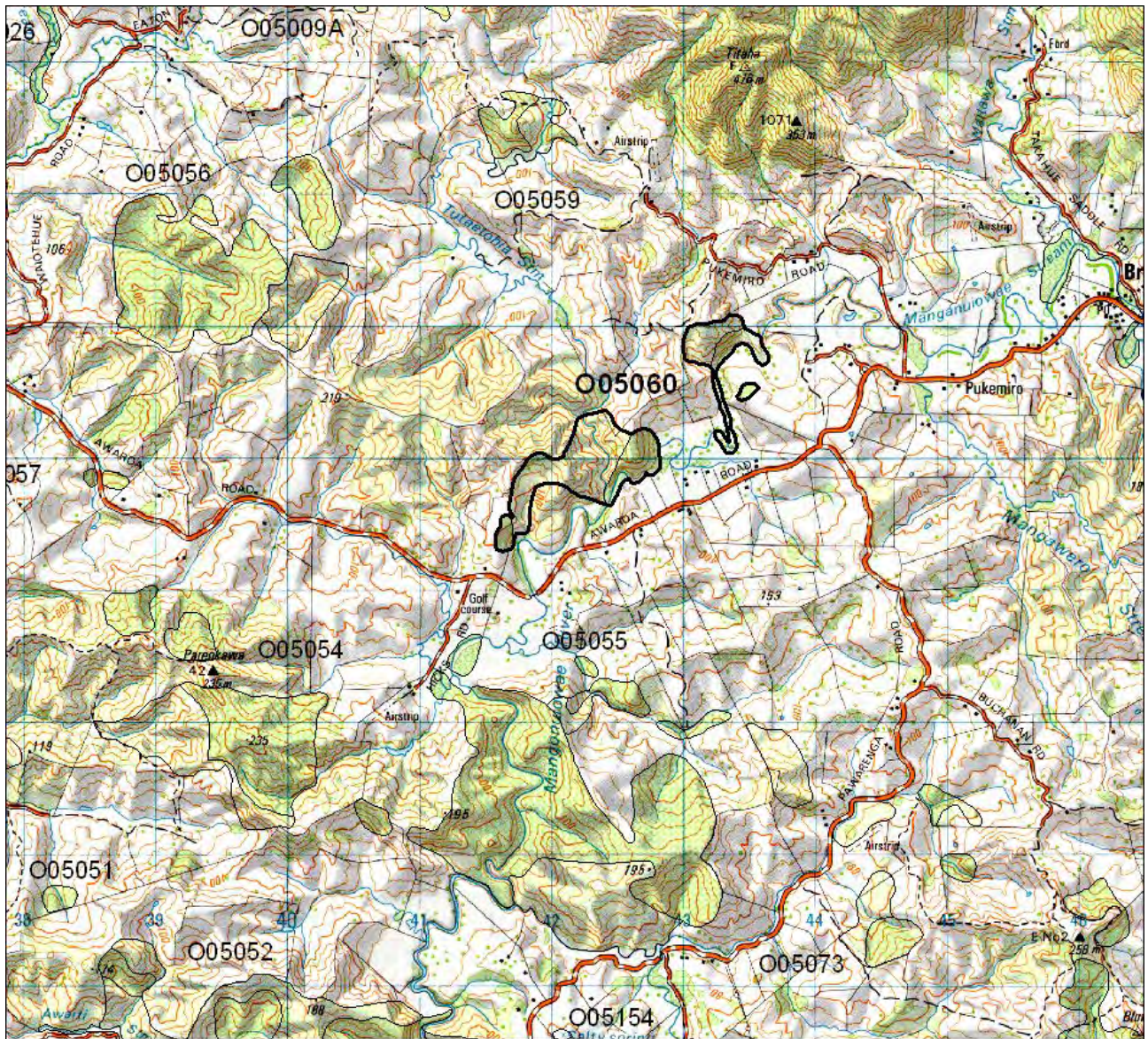
Not surveyed by the Department of Conservation. NI brown kiwi (Serious Decline) has been reported from this site.

Significance

Representative site for taraire forest on alluvium, a nationally uncommon vegetation type.

Presence of NI brown kiwi.

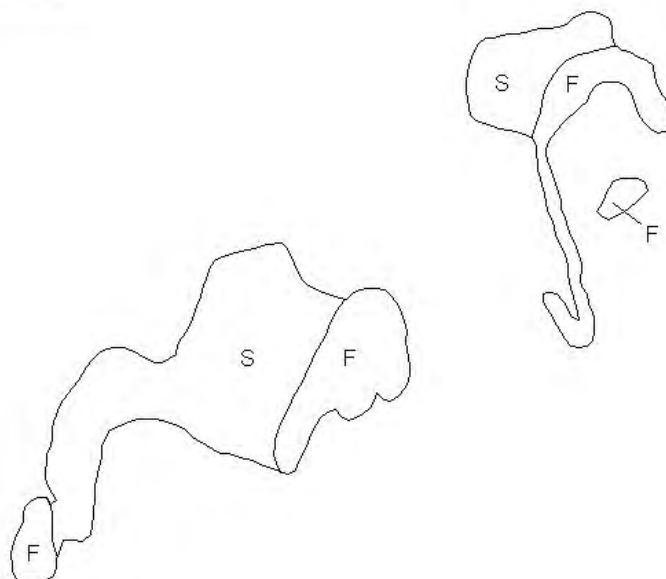
The only site in the Ecological District where type (c), kanuka-rimu forest is recorded.



Pukemiro Remnants O05/060

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



BROADWOOD RIPARIAN REMNANTS

Survey no.	O05/061
Survey date	23 January 1995
Grid reference	O05 482 597, O05 463 598, O05 473 598, O05 466 597 O05 463 602, O05 478 599, O05 458 604
Area	25 ha
Altitude	80 m asl

Ecological unit

- (a) Taraire forest on alluvium
- (b) Kahikatea-towai secondary forest on alluvium
- (c) Kahikatea-taraire forest on alluvium

Landform/geology

Valley alluvium with adjoining Mangakahia Complex sandstone hillside at Broadwood.

Vegetation

A series of broadleaf and broadleaf/podocarp habitats along Manganuiowae Stream.

(a) The Broadwood Scenic Reserve is a small taraire-dominant remnant with frequent kahikatea and occasional titoki, puriri, northern rata, totara and kowhai.

The sub-canopy contains nikau in abundance with frequent wheki and ponga. Large-leaved mahoe, ti kouka, rangiora, pate, mapou, tarata and kohuhu also occur.

The invasive weed wandering willy, is frequent on the ground, along with kiekie, kahikatea, nikau and hen and chicken fern.

(b) The Broadwood Church Bush consists of abundant secondary kahikatea and towai with frequent taraire. Nikau, puriri, pukatea, matai, ti kouka, karaka, kowhai and kohuhu also occur.

Nikau dominates the sub-canopy. The shrub layer consists of mahoe, mapou and tree ferns. The ground cover is sparse and largely made up of terrestrial weeds including wandering willy, African club moss and wild ginger.

Further upstream are riparian remnants where type (c) kahikatea and taraire are common and towai and manuka occur frequently. Titoki, and pukatea are present.

Fauna

Kukupa (Gradual Decline) and kauri snail (Gradual Decline).

Significance

Representative site. Riparian broadleaf-podocarp forest on river flats is a nationally uncommon habitat type.

Presence of threatened species.

Management of invasive weeds at the site will greatly enhance the ecological health and integrity of the site.

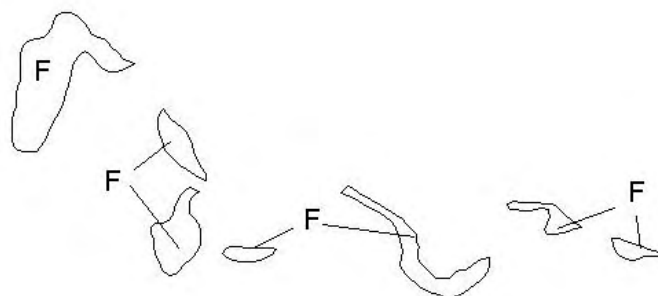
Scenic Reserve of 7 ha and Marginal Strip of 2 ha is contained within this site and is administered by the Department of Conservation.



Broadwood Riparian Remnants O05/061

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

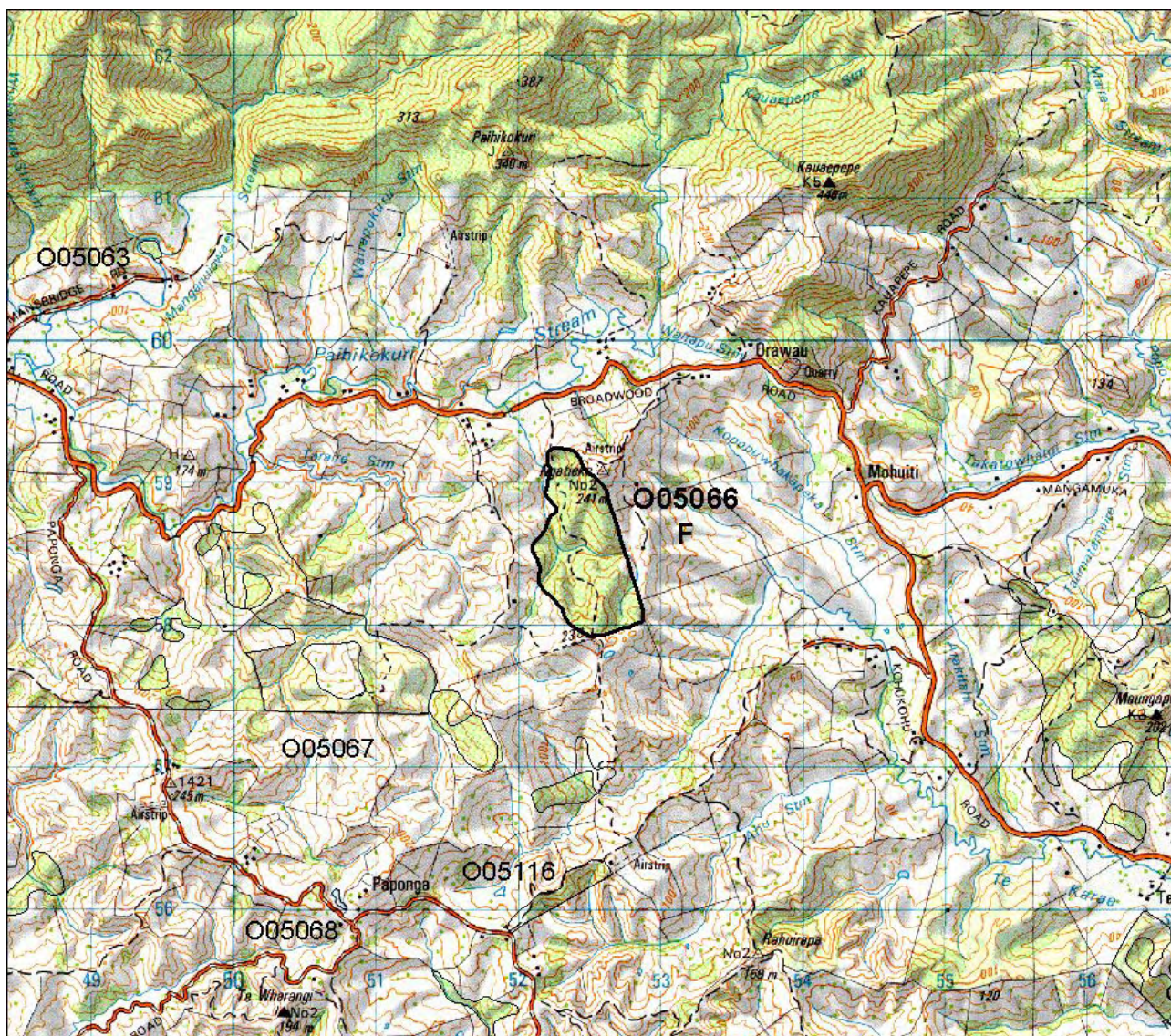


NGATIEKE AIRSTRIP BUSH

Survey no. O05/066
 Survey date 20 February 1995
 Grid reference O05 524 585
 Area 63 ha
 Altitude c. 150-240 m asl

Ecological unit

(a) Taraire-towai forest on hillslope



Ngatieke Airstrip Bush O05/066

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

S = shrubland
 F = forest
 W = wetland
 E = estuarine
 D = duneland

Landform/geology

Dissected hill country on Mangakahia Complex sandstone.

Vegetation

Taraire and towai form an even canopy with occasional totara, rewarewa, hinau, kahikatea, rimu, puriri and emergent northern rata. Tanekaha, miro and tawa are also present.

In the sub-canopy *Coprosma* spp. are common with kohekohe, totara, lancewood, large-leaved mahoe, rangiora, hangehange, mapou, pigeonwood, ponga and supplejack.

Fauna

1978 record of NI brown kiwi (Serious Decline) and kukupa (Gradual Decline).

Significance

A large representative area of diverse vegetation forming a partial linkage between Raetea Forest, Tapuwae Scenic Reserve and the Hokianga Harbour. Presence of threatened species.

LANDCORP PAPONGA REMNANTS

Survey no.	O05/067
Survey date	27 February 1995
Grid reference	O05 496 574, O05 494 576, O05 495 580, O05 507 579
Area	119 ha (29 ha forest, 90 ha shrubland)
Altitude	100–200 m asl

Ecological unit

- (a) Taraire secondary forest on hillslope
- (b) Manuka shrubland on hillslope
- (c) Manuka–towai shrubland on hillslope
- (d) Totara secondary forest on hillslope
- (e) Taraire–towai secondary forest on hillslope

Landform/geology

Dissected hill country on Mangakahia Complex sandstone.

Vegetation

(a) The southeastern remnant is taraire–dominant with frequent towai, totara and kahikatea. Puriri, pukatea and rewarewa are occasional.

(b) In the larger shrubland area manuka to 3 m tall occurs with scattered towai, totara and mamaku.

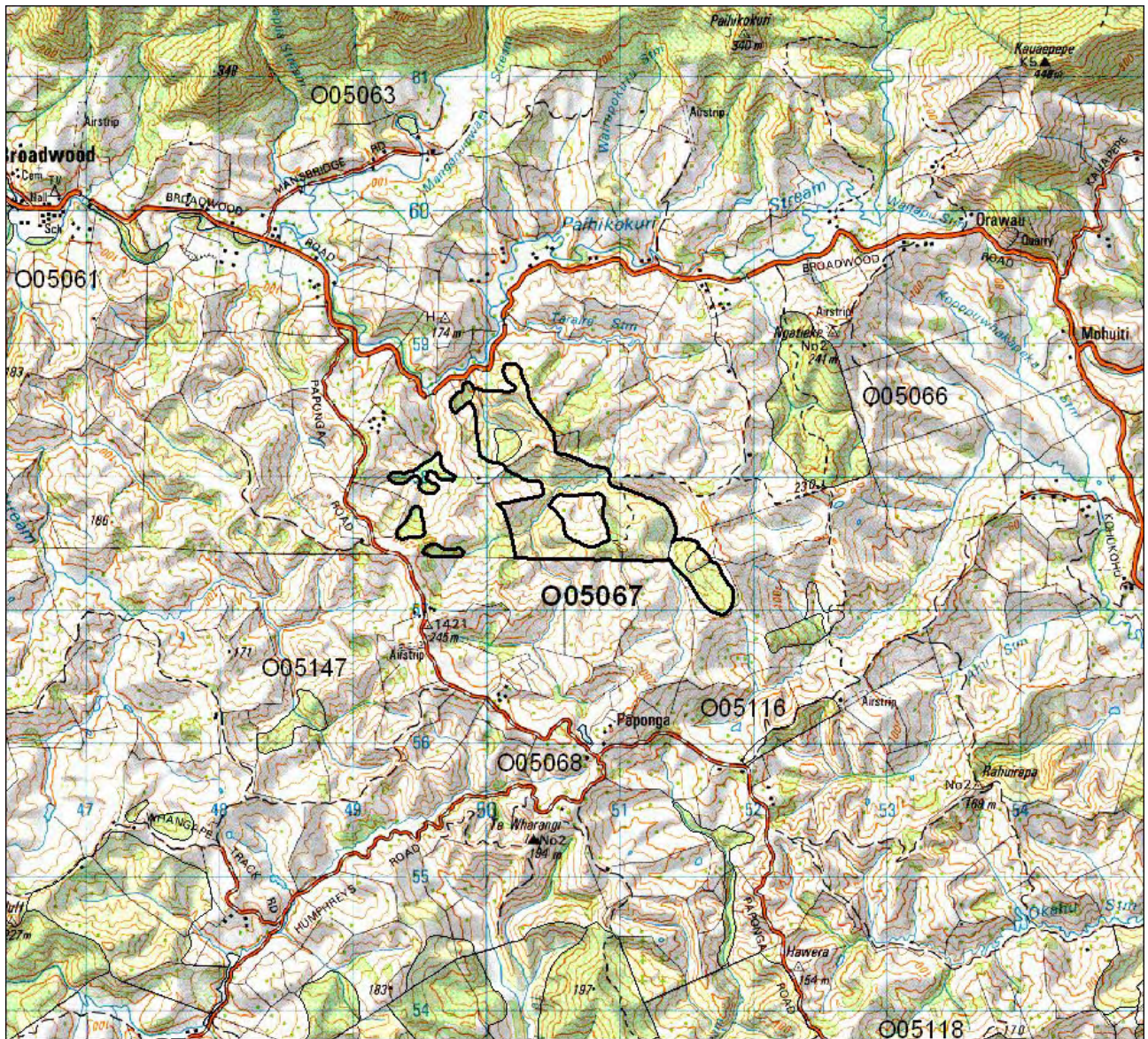
(c) Tall manuka and towai shrubland also occurs here with frequent totara, and occasional mamaku and kahikatea.

In the western remnants taraire, type (a), occurs with frequent towai and kahikatea. Rimu, puriri, pukatea, and rewarewa are occasional.

The site also contains abundant totara, type (d) and type (e) common taraire and towai with frequent kahikatea and occasional puriri, rewarewa and totara.

Fauna

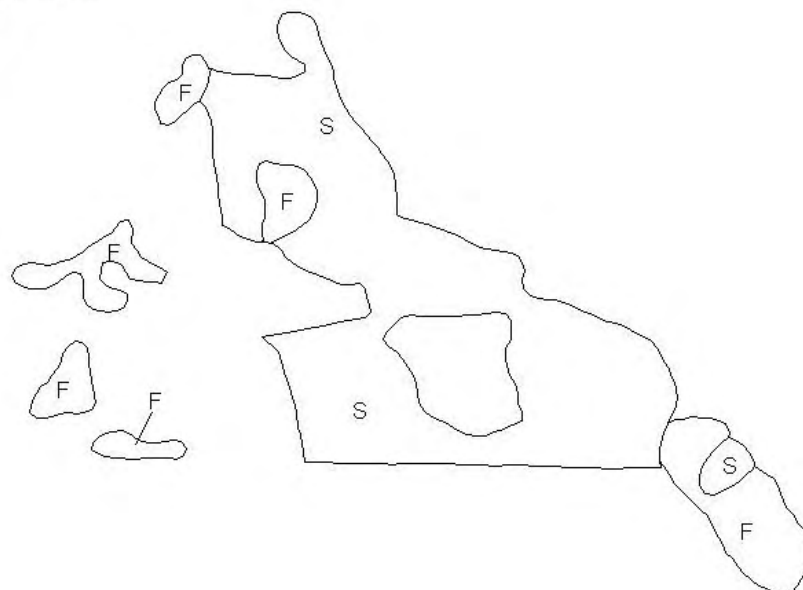
Not surveyed by the Department of Conservation. NI brown kiwi (Serious Decline) has been reported from this site.



Landcorp Paponga Remnants O05/067

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



Significance

Gully and riparian protection. A partial linkage between Tapuwae and Raetia Forests.

Presence of NI brown kiwi.

Stewardship Land administered by the Department of Conservation protects 9 ha of this site.

HUMPHREYS BUSH

Survey no.	O05/071
Survey date	16 and 23 January, 27 February 1995
Grid reference	O05 461 555, O05 469 545, O05 473 554 O05 476 553, O05 458 531
Area	438 ha (187 ha forest, 250 ha shrubland, 2 ha wetland)
Altitude	c.100-256 m asl

Ecological unit

- (a) Raupo reedland on alluvium in stream valley
- (b) Kanuka/manuka shrubland on hillslope
- (c) Kanuka-manuka-towai forest on hillslope
- (d) Taraire forest on hillslope
- (e) Taraire-towai forest on hillslope
- (f) Manuka-totara-towai forest on hillslope
- (g) Kahikatea-totara secondary forest on hillslope
- (h) Manuka shrubland on hillslope

Landform/geology

Dissected hill country of Mangakahia Complex sandstone, including some headwater catchments, and running down to valley floor wetland with sandstone bluffs on the high points.

Vegetation

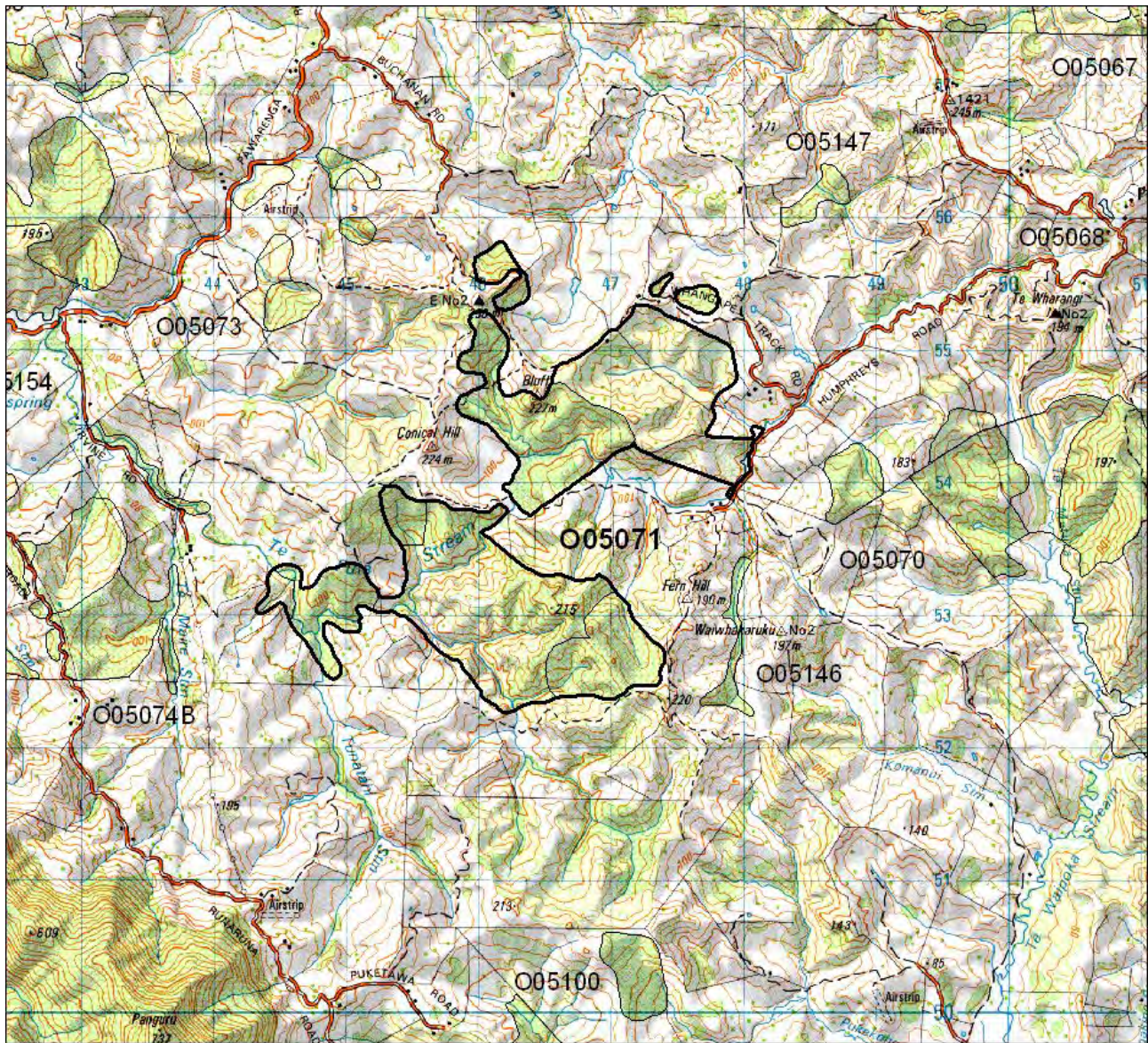
A mosaic of shrubland and forest from Humphreys Rd in the east to Irvine Rd in the west.

(a) At the end of Humphreys Rd, raupo is abundant in the Te Puia Stream. Some honeysuckle is present. There is some manuka and totara on the margin. NI fernbird may be present.

(b) Adjoining the Te Puia Stream is a large area of kanuka and manuka shrubland 4-6 m in height with occasional totara, and type (c) taller kanuka/manuka and towai forest. Totara and kahikatea also occur occasionally. Moving west, totara becomes frequent, and rewarewa and pine also occur here.

The understorey consists mainly of ponga and wheki with pate, hangehange, five-finger, mingimingi, *Lycopodium* sp., ring fern and blackberry. Some clearings with abundant bracken occur here.

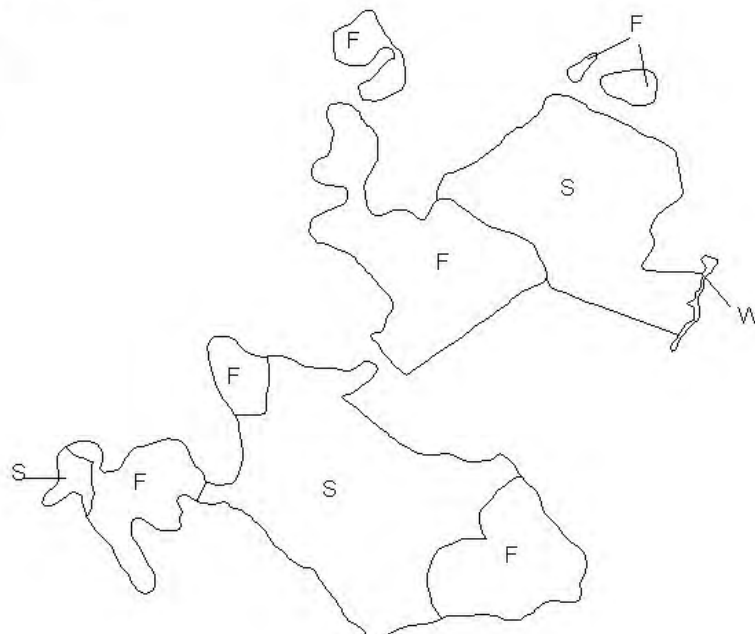
(d) The main bush in Humphreys Rd contains abundant tall taraire with frequent towai. Puriri, kahikatea, rimu, kohekohe, hinau, miro and totara also occur here. Northern rata and rewarewa are occasionally emergent.



Humphrey's Bush 005/071

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



The understorey contains vigorous kahikatea regeneration, with patches of good totara regeneration also. There is extensive supplejack and a wide range of ferns, including several filmy ferns. However the shrub layer is sparse, due to previous grazing but kohekohe, *Coprosma rhamnoides*, and putaputaweta occur.

This type also occurs in the south and west, with towai and totara being frequent. A wide variety of canopy species occur occasionally including hinau, miro, tawa, pukatea and emergent northern rata and kauri (rarely). Along the Te Puia Stream, taraire is abundant, and totara, rewarewa, pukatea, matai and emergent rimu, northern rata, and kahikatea occur occasionally. Type (g) secondary kahikatea and totara also occurs here.

(e) To the north, around Trig E No 2, taraire and towai are common with frequent totara and kahikatea. Pukatea, northern rata, rimu, rewarewa, nikau, puriri and tawa also occur here.

(f) There is also an area of manuka, totara and towai shrubland and type (h) some low manuka in this vicinity.

An extensive area of type (b), tall kanuka/manuka shrubland adjoins the forest in the south west with scattered towai, mamaku, kahikatea, totara and rewarewa. Areas of type (h), lower manuka shrubland occur on both the western and eastern sides (much of the latter since crushed).

Fauna

NI brown kiwi (Serious Decline) have been reported at this site and kukupa (Gradual Decline) and kauri snail (Gradual Decline) have been recorded.

Significance

A large, diverse habitat containing threatened fauna species. Forms a partial linkage between Hokianga Harbour and Raetia Forest and is largely adjoined by recently established pine plantations.

Presence of threatened species.

Representative site for type (d). Only one of two examples of type (f) recorded in the Ecological District.

KAWAKA STREAM REMNANT

Survey no.	O05/075
Survey date	16 January 1995
Grid reference	O05 417 528
Area	18 ha
Altitude	80-120 m asl

Ecological unit

(a) Kahikatea-totara secondary forest on moderate hillslope

Landform/geology

Hill country on Mangakahia Complex sandstone.

Vegetation

A secondary podocarp area in which kahikatea is abundant and totara common. Rimu, puriri, taraire, pukatea, rewarewa, nikau and emergent northern rata are occasional. One ricker kauri was apparent in the canopy.



Kawaka Stream Remnant O05/075

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

Fauna

Not surveyed.

Significance

A representative site exhibiting one of the best examples of secondary podocarp regeneration in the District.

WHAREKAUERE BUSH REMNANTS

Survey no.	O05/087
Survey date	4 May 1995
Grid reference	O05 515 425, O05 526 420, O05 532 431
Area	265 ha (76 ha forest, 189 ha shrubland)
Altitude	0-152 m asl

Ecological unit

- (a) Manuka-tanekaha-taraire forest on coastal hillslope
- (b) Manuka shrubland on coastal hillslope
- (c) Taraire-nikau forest on coastal hillslope
- (d) Manuka-nikau-taraire forest on coastal hillslope

Landform/geology

An area of dissected hill country underlain by Mangakahia Complex sandstone and a small area of Mangakahia Complex siliceous mudstone in the southeast.

Vegetation

This site is notable for its sequential gradients from hill forest into estuarine associations. Some areas within this site are in an early stage of regeneration due to repeated burning, but other areas exhibit diverse advanced secondary coastal forest with an abundance of associated species.

- (a) Manuka, tanekaha and taraire forest occurs in the eastern remnant. Rewarewa, puriri, kahikatea and towai are frequent. Occasional species include pukatea, kowhai, titoki, and nikau.
 - (b) Manuka dominates shrubland in the eastern remnant with occasional ti kouka, mamangi and tanekaha.
 - (c) The forest in the southern remnant is dominated by taraire with common nikau. Puriri, manuka and kahikatea are frequent. Rimu, totara, towai, titoki and ti kouka are rare.
 - (d) The forest area in the western remnant is defined by manuka, nikau and taraire. Kahikatea, puriri, tanekaha, and rewarewa are frequent and ti kouka, pukatea and rimu are occasional.
- Type (b) manuka shrubland also dominates the large shrubland area in the western remnant with the occasional ti kouka and mamangi.

Fauna

NI brown kiwi (Serious Decline) has been reported from this site.

Significance

Contains coastal shrubland and forest remnants grading into the estuarine/mangrove associations of Hokianga Harbour. Presence of NI brown kiwi.

Representative site for all ecological units and the only recorded example in the Ecological District of type (a), (c) and (d).

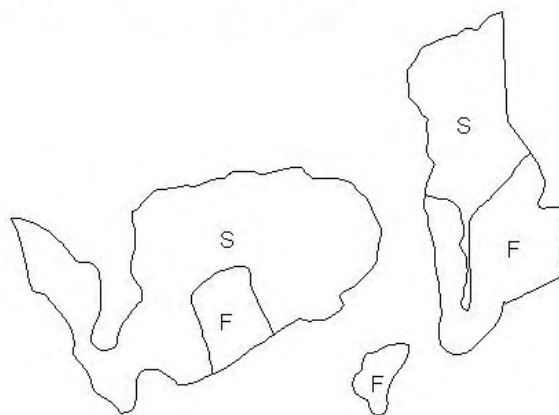
Marginal Strip of one hectare, administered by the Department of Conservation occurs within this site.



Wharekareare Bush Remnants O05/087

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



TE KARAKA POINT COASTAL FOREST

Survey no.	O05/089
Survey date	28 June 1994
Grid reference	O05 472 415
Area	60 ha
Altitude	0-52 m asl

Ecological unit

- (a) Rewarewa-taraire-towai forest on coastal hillslope (30%)
- (b) Kanuka/manuka-tanekaha-totara forest on coastal hillslope (30%)
- (c) Kanuka/manuka forest on coastal hillslope (30%)
- (d) Kanuka/manuka-kowhai-mamangi forest on coastal hillslope (10%)

Landform/geology

This site is a coastal headland underlain by Mangakahia Complex sandstone and adjoins estuarine sediments supporting mangrove forest and saltmarsh.

Vegetation

One of the best examples of coastal forest associations remaining within the Hokianga Ecological District. It is largely secondary forest that has not been burnt for many years and is again approaching a climax plant community association. Unfortunately kahili ginger has become established and requires urgent action if the site is to avoid future viability problems. Cattle also have unrestricted access and will be spreading weeds throughout the site as well as damaging the habitat.

- (a) Rewarewa, taraire and towai are common with frequent puriri, kahikatea and occasional tanekaha, kowhai, pukatea, tawa, matai, miro and emergent northern rata.
- (b) An association of kanuka/manuka, tanekaha and totara occurs with occasional rewarewa, rimu, puriri, and pohutukawa.
- (c) Tall kanuka/manuka forest occurs with frequent totara, kahikatea, and kowhai. Occasional species include puriri, kohuhu, kauri and pohutukawa.
- (d) A smaller area of forest is defined by kanuka/manuka, kowhai and mamangi. Karaka, pohutukawa, and ti kouka are frequent. Puriri, harakeke and hangehange are also present.

Fauna

NI tomtit (Regionally significant species). NI brown kiwi (Serious Decline) has been reported at this site.

Significance

One of the largest and best-quality examples of coastal forest associations remaining within this Ecological District, representative site for all ecological units with type (a) and (d) unrecorded elsewhere in the Ecological District.

Presence of a threatened and regionally significant species.



Te Karaka Point Coastal Forest O05/089

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

LOWER WAIHOU SWAMP & SHRUBLAND

Survey no.	O05/090
Survey date	28 June 1994
Grid reference	O05 443 432, O05 455 426
Area	95 ha (11 ha forest, 64 ha shrubland, 20 ha wetland)
Altitude	< 20-107 m asl

Ecological unit

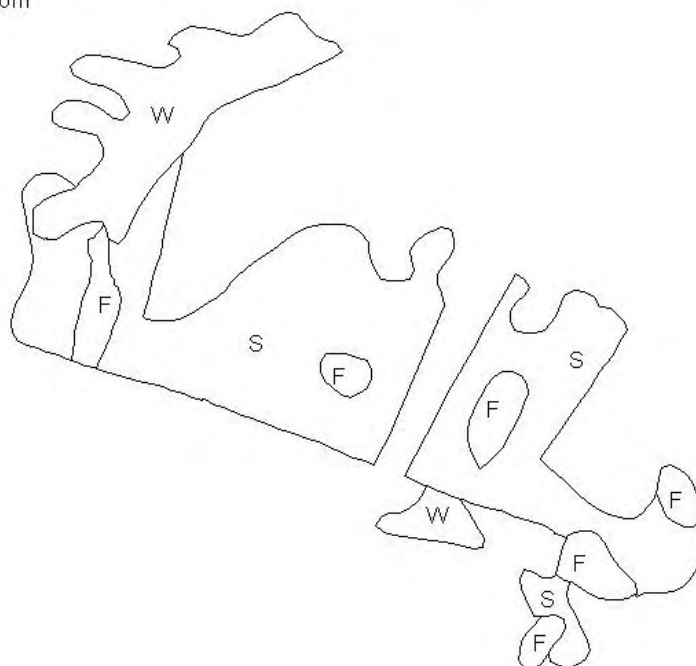
- (a) Raupo reedland in swamp (40%)
- (b) Kanuka/manuka shrubland on hillslope (40%)



Lower Waihou Swamp & Shrubland O05/090

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



- (c) Kahikatea-ti kouka swamp forest on alluvium (5%)
- (d) Puriri-taraire-towai forest on hillslope (15%)

Landform/geology

Alluvial/estuarine deposits on the floor of a wide valley. The hill country is underlain by Mangakahia Complex sandstone and siliceous mudstone.

Vegetation

- (a) Raupo-dominant wetland.

The remainder is a diverse mix of secondary forest and advanced shrubland separated into two blocks but now re-linked by a strip of pine.

- (b) Kanuka/manuka shrubland with occasional totara, tanekaha, mamangi and ti kouka.

- (c) Kahikatea and ti kouka are commonly associated with frequent nikau, and kanuka/manuka. Mamangi, pukatea and houhere are occasional.

- (d) Puriri, taraire and towai are commonly associated with frequent rimu. Miro and kahikatea are also present.

Fauna

Birds: NI fernbird and high numbers of spotless crane (both Sparse).

Fish: 2001 record of inanga and the pest fish *Gambusia* were also recorded.

Significance

One of the largest remnants of a mineralised freshwater wetland within the Hokianga Ecological District. It contains a rare swamp forest association and has riparian values. At least two threatened wetland birds have been recorded here. Representative site for all ecological units.

MOTUTI COASTAL REMNANTS

Survey no.	O05/091
Survey date	27 June 1994
Grid reference	O05 470 445, O05 487 453
Area	203 ha (36 ha forest, 167 ha shrubland)
Altitude	0-142 m asl

Ecological unit

- (a) Kanuka/manuka-kahikatea forest on terrace and coastal hillslope
- (b) Nikau-taraire forest on coastal hillslope
- (c) Kanuka/manuka shrubland on terrace and coastal hillslope
- (d) Kahikatea forest on alluvial terrace
- (e) Rimu forest on alluvial terrace
- (f) Kanuka/manuka-kahikatea forest on alluvial terrace
- (g) Raupo reedland in small depression
- (h) *Baumea rubiginosa* sedgeland in swamp
- (i) *Coprosma propinqua* swamp shrubland in brackish zone
- (j) *Baumea articulata*-kikuyu association on alluvium

Landform/geology

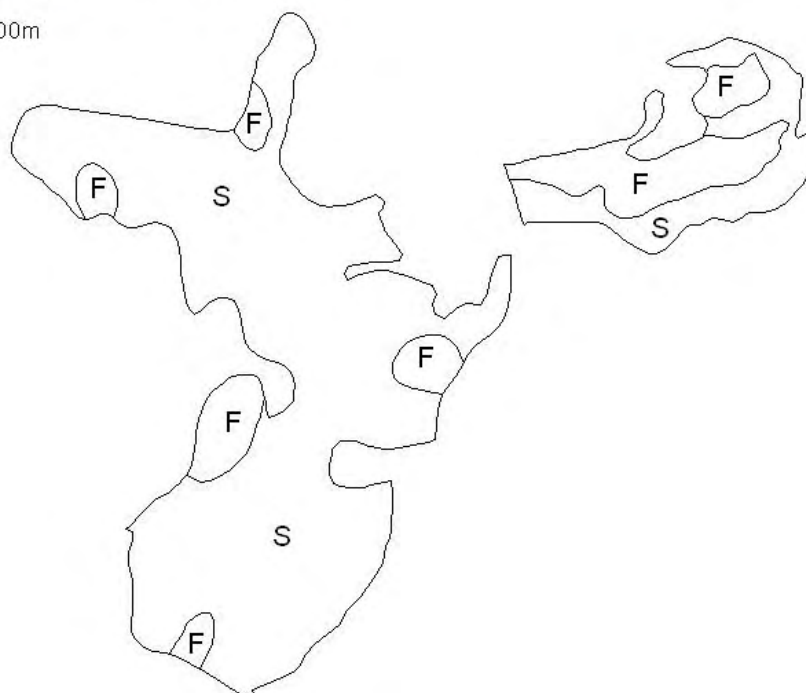
The larger dissected coastal headland is underlain by Mangakahia Complex sandstone and is more typical of secondary coastal forest/shrubland remnants



Motuti Coastal Remnants O05/091

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



within the Hokianga Harbour than the smaller remnant. The eastern arm is situated on a quarternary terrace and Holocene estuarine deposits exhibit attributes which are largely absent from the remainder of this Ecological District.

Vegetation

Composed of two slightly separate forest/shrubland remnants, the Motuti Coastal Remnants exhibit a great range of forest and coastal ecotones and species diversity.

The larger western area contains:

Type (a) Kanuka/manuka and kahikatea are common while puriri and titoki are frequent and pukatea, ti kouka, kowhai and emergent northern rata are occasional.

(b) Abundant nikau with common taraire occurs with frequent puriri and kahikatea. Occasional species include ti kouka, titoki and emergent kauri and rimu.

(c) Most of this western area is dominated by kanuka/manuka shrubland with occasional ti kouka, totara, puriri and kahikatea.

The eastern arm contains:

(d) Abundant kahikatea with occasional rimu, puriri and ti kouka.

(e) A small area of dominant rimu occurs with frequent kahikatea and occasional totara.

(f) Kanuka/manuka is dominant with common kahikatea and frequent towai and puriri. Occasional species include titoki, tanekaha, rimu and wattle.

Type (c) kanuka/manuka dominates the shrubland area here with isolated kahikatea.

(g) A very small area of raupo occurs with the occasional ti kouka.

(h) In a swampy area *Baumea rubiginosa* occurs with frequent swamp millet.

(i) An area of *Coprosma propinqua* also occurs.

(j) Heavily grazed *Baumea articulata* occurs on the foreshore and is being invaded by kikuyu and paspalum.

Significant flora

Korthalsella salicornoides (Sparse), *Olearia solandri* and black maire (both Regionally significant species).

Fauna

NI fernbird (Sparse) and common forest birds. NI brown kiwi (Serious Decline) has been reported from this site.

Significance

The site contains examples of rare forest types, podocarp forest, of high quality, and a relatively unmodified sequence from estuarine associations to alluvial forest, being a very gradual sequential transition from dry land to estuary.

Representative site for type (a), (b), (c), (d), (e), (h) and (i) with the site containing the only examples recorded in the Ecological District of type (a), (b), (f), (h), and (e). It is the only site in the Ecological District where *Baumea* dominant vegetation occurs.

Presence of threatened and regionally significant species.

PANGURU/PUKEPOTO SHRUBLANDS

Survey no.	O05/094
Survey date	28 June 1994
Grid reference	O05 446 451, O05 450 462
Area	125 ha (4 ha forest, 121 ha shrubland)
Altitude	0-c. 100 m asl

Ecological unit

- (a) Kowhai-puriri-taraire forest on coastal hillslope (2%)
- (b) Kanuka/manuka shrubland on coastal hillslope (98%)

Landform/geology

A shrubby peripheral extension of the Warawara Forest tract, the Panguru/Pukepoto Shrublands are within a different Ecological District than the 'parent' block of Warawara. This is evidenced by the different geological base on which it occurs - Mangakahia Complex sandstone as opposed to the Tangihua Complex volcanics of the Warawara Forest.

Vegetation

- (a) A small area of kowhai, puriri and taraire occurs with frequent tawa, kahikatea, kohekohe, totara, kanuka and occasional titoki, northern rata, nikau, karaka, rewarewa and pukatea.
- (b) Most of the site is kanuka/manuka shrubland with occasional kahikatea and puriri.

Fauna

Several threatened and regionally significant animals are found within Warawara Forest and as this site is contiguous some of these species would be present such as: NI brown kiwi (Serious Decline), kukupa (Gradual Decline) and NI tomtit (both Regionally significant species).

Significance

Panguru/Pukepoto Shrublands is contiguous with Warawara Forest and therefore by association shares the values of the greater forest with the likely presence of threatened species.

A representative site for both ecological units displaying one of the very few sites within the Warawara Forest tract where the full altitudinal sequence is retained to sea level.

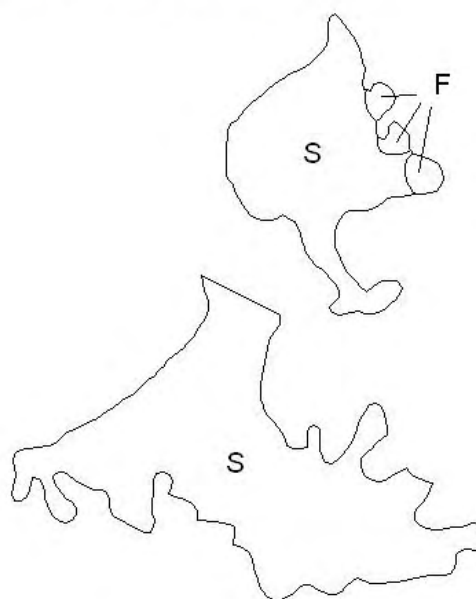
Type (a) kowhai-puriri-taraire is the only one of its type recorded in the Ecological District.



Panguru / Pukepoto Shrublands O05/094

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



MATAWERA RD BUSH

Survey no.	O05/096
Survey date	24 June 1994
Grid reference	O05 490 470, O05 501 472, O05 486 476, O05 500 472
Area	160 ha (55 ha forest, 105 ha shrubland)
Altitude	0-120 m asl

Ecological unit

- (a) Kanuka/manuka shrubland on hillslope
- (b) Tanekaha-taraire-towai forest on hillslope

Landform/geology

It is dissected hill country underlain with Akarua Supergroup conglomerate and Mangakahia Complex sandstone which contains altitudinal sequences running from sea level up to 120 m asl.

Vegetation

This site is comprised of several secondary and logged forest remnants linked by kanuka/manuka shrubland and plantation forest. They are an important part of the chain of forest remnants which loosely link the Warawara Forest tract to that of Tapuwae Forest.

- (a) Kanuka and manuka shrubland occurs with frequent towai and occasional mamaku, ti kouka and pate.
- (b) The rest of the site is comprised of a tanekaha, taraire, towai association with several frequently occurring species including puriri, kahikatea, rewarewa, mamangi, nikau, and emergent kauri. Occasional species include northern rata, rimu, matai, totara, puka and whau. Tanekaha is locally dominant on one ridge.

Fauna

NI brown kiwi (Serious Decline), kukupa (Gradual Decline) and common forest birds are present.

Significance

Some coastal riparian margin, and almost contiguous with Tapuwae Scenic Reserve.

A representative site for both ecological units and the only occurrence of type (b) recorded in the Ecological District.

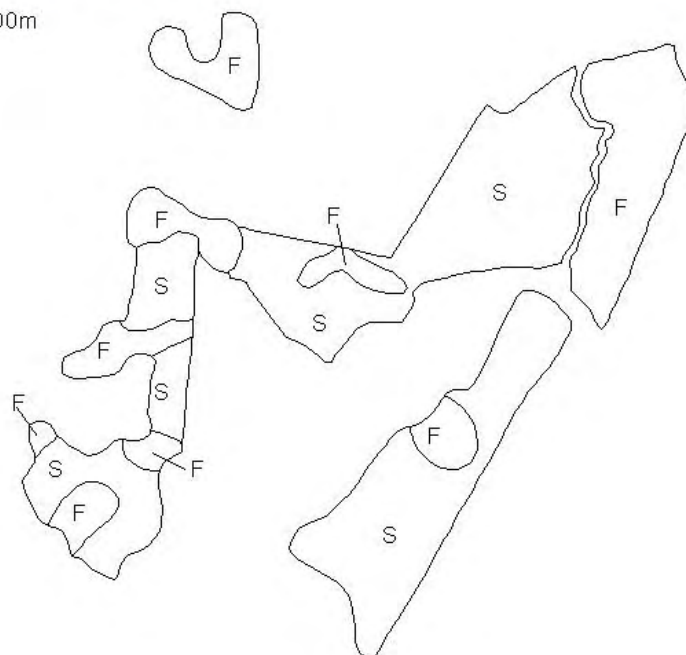
Habitat for threatened species.



Matawera Rd Bush O05/096

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



TAPUWAE SCENIC RESERVE

Survey no. O05/097
 Grid reference O05 522 467
 Area 406 ha
 Survey date 24 June 1994
 Altitude 0-140 m asl

Ecological unit

- (a) Kanuka/manuka forest on coastal hillslope (40%)
- (b) Kanuka/manuka-tanekaha-towai forest on coastal hillslope (58%)



Tapuwae Scenic Reserve O05/097

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

S = shrubland
 F = forest
 W = wetland
 E = estuarine
 D = duneland

(c) Kahikatea-kowhai-puriri forest on coastal hillslope (2%)

Landform/geology

Dissected hill country underlain with Mangakahia Complex sandstone.

Vegetation

Centred around the Tapuwae Scenic Reserve, this large site is in a successional stage being dominated by kanuka/manuka associations. The site exhibits a zonation from hill country through to mangrove forest on estuarine deposits in the Tapuwae River channel and is linked via this estuarine forest and remnant riparian forest to Tapuwae Forest and the Motukaraka Scenic Reserve to the north.

(a) Dominant kanuka/manuka with frequent tanekaha and kahikatea. Rewarewa, puriri and totara are occasional.

(b) Kahikatea, kowhai and puriri are co-dominant while taraire, totara, nikau, kahikatea, rewarewa and emergent kauri are frequent. Matai, miro, kohekohe, karaka and emergent northern rata and rimu are occasional.

(c) A very small area comprises kahikatea, kowhai and puriri, kanuka/ manuka is frequent and rewarewa occasional.

Significant flora

Kawaka and wharangi are uncommon in this Ecological District.

Fauna

NI brown kiwi (Serious Decline), kukupa (Gradual Decline), banded rail and NI fernbird (both Sparse).

Significance

A relatively large site with altitudinal sequences and riparian values.

Representative site for all ecological units with the only record of type (c) and only one of two records of type (b) in the Ecological District.

Presence of threatened species.

Scenic Reserve of 208 ha, administered by the Department of Conservation, protects 51% of this site.

TAPUWAE RIVER BUSH

Survey no.	O05/098
Survey date	24 June 1994
Grid reference	O05 522 481
Area	78 ha
Altitude	0-c. 120 m asl

Ecological unit

(a) Kanuka/manuka-totara forest on coastal hillslope

Landform/geology

This site is composed of dissected hill country adjoining the Tapuwae River estuary and which is underlain by Mangakahia Complex sandstone.

Vegetation

Abundant kanuka/manuka occurs with common totara. Canopy species include frequent kowhai, tanekaha, kahikatea, towai, and rewarewa and occasional matai, houhere, emergent northern rata and kauri.



Tapuwae River Bush O05/098

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

It is apparent from aerial photographs that an older growth forest type is present, but was not described due to the difficulty in gaining a good view.

Fauna

NI brown kiwi (Serious Decline) has been reported at this site.

Significance

Representative site with its significance due to its coastal riparian nature.

Presence of a threatened species.

A forested link between the larger forests to the north and south.

TAPUWAE WETLAND

Survey no. O05/099
 Survey date 24 June 1994
 Grid reference O05 501 485
 Area 0.4 ha
 Altitude < 2 m asl

Ecological unit

(a) Raupo reedland in swamp



Tapuwae Wetland O05/099

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

S = shrubland
 F = forest
 W = wetland
 E = estuarine
 D = duneland

Landform/geology

Alluvium and marine deposits.

Vegetation

The area adjoins saltmarsh/mangrove associations which are suffering the effects of wetland drainage and unrestricted stock access. These estuarine associations are included under the Hokianga Harbour site.

Abundant raupo occurs with frequent ti kouka, and occasional manuka and saltmarsh ribbonwood.

Fauna

Not surveyed but this site provides ideal habitat for the nationally threatened banded rail and spotless crane (both Sparse).

Significance

A representative small freshwater wetland at the head of a tidal arm of the Tapuwae River, this raupo dominant freshwater wetland is an example of a habitat type which has become extremely rare due to pastoral development and unrestricted grazing within the Hokianga Ecological District. Examples of this fresh/brackish/saline interface are practically absent from the North Hokianga but are still present (in partly drained form) in the vicinity of the Waima River in the South Hokianga.

WAIRUPE FOREST REMNANT

Survey no.	O05/111
Survey date	20 June 1994
Grid reference	O05 559 490
Area	6 ha
Altitude	c. 10–40 m asl

Ecological unit

(a) Kowhai–puriri–totara forest on toeslope

Landform/geology

It is underlain by Mangakahia Complex sandstone.

Vegetation

Lowland forest of kowhai, puriri and totara with frequent kahikatea, titoki and manuka. White maire, kohekohe, rewarewa, ti kouka, kohuhu, and harakeke are occasional.

Fauna

Not surveyed.

Significance

Representative of a now rare transitional swamp–forest/hill–forest vegetation type, of which this is the only such example in this Ecological District. The swamp forest which would once have adjoined this remnant has long been replaced by pasture, but the lowland/swamp forest influence remains as evidenced by the presence of species such as kahikatea, titoki, manuka, white maire, kohuhu, kowhai, ti kouka and harakeke.

Representative site and only example in the Ecological District.



Wairupe Forest Remnant O05/111

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

MOTUKARAKA REMNANT

Survey no.	O05/112
Survey date	20 June 1994
Grid reference	O05 573 474
Area	7 ha
Altitude	0-70 m asl

Ecological unit

(a) Kanuka/manuka-tanekaha-totara forest on coastal hillslope

Fauna

Common forest birds.

Significance

Representative site exhibiting a coastal forest type in relatively good condition. Some riparian functions are implied by the close proximity of the sea.

BLUE MOUNTAIN RD BUSH

Survey no.	O05/114
Survey date	20 June 1994
Grid reference	O05 572 497, O05 591 493
Area	187 ha (65 ha forest, 122 ha shrubland)
Altitude	40–220 m asl

Ecological unit

- (a) Kanuka/manuka–totara forest on hillslope
- (b) Tanekaha–totara forest on hillslope
- (c) Puriri–taraire forest on hillslope
- (d) Taraire forest on steep hillslope
- (e) Taraire–towai forest on hillslope
- (f) Kanuka forest on hillslope
- (g) Kahikatea–totara secondary forest on hillslope
- (h) Kanuka/manuka shrubland on hillslope

Landform/geology

Medium-sized cutover and secondary forest remnant on dissected hill country underlain by Mangakahia Complex sandstone.

Vegetation

- (a) Kanuka/manuka is abundant with common totara and frequent kahikatea and tanekaha and occasional puriri, rimu and mamaku.
- (b) Tanekaha and totara forest with frequent kahikatea, and rewarewa. Puriri and rimu are occasional.
- (c) Puriri and taraire are associated with frequent towai, rewarewa, kahikatea and puka and occasional kohekohe, nikau, matai, miro and emergent pukatea, rimu and northern rata.
- (d) Taraire forest occurs in the remnant to the east of Rakautapu Rd. Towai, emergent northern rata, totara, rewarewa, puriri and kohekohe are frequent while rimu, pukatea, nikau, kahikatea, matai and miro are occasional. Smaller remnants occur in the gullies to the east of Rakautapu Rd, with frequent secondary kahikatea and occasional rewarewa.
- (e) Taraire and towai forest occurs in the north east of the site with occasional kahikatea, rewarewa, and mamaku. A stand of eucalypt, pine and macrocarpa occurs in this area.
- (f) Kanuka forest occurs on the northern side with frequent totara and occasional rimu and kahikatea.
- (g) Secondary kahikatea and totara forest occurs below the road on the northern side of the block.

(h) Kanuka/manuka shrubland between 4–6 m tall covers about 50% of the area, with occasional mamaku, totara, kahikatea, puriri, tobacco weed and pampas.

Fauna

NI brown kiwi (Serious Decline) has been reported from this site.

Significance

A large site with a variety of age stages from recent regeneration, vigorous secondary forest to cutover old-growth forest, which performs an upper catchment and riparian protection function.

Presence of NI brown kiwi.

Representative site for type (b), only record in the Ecological District and type (c).

TAPUWAE FOREST & OUTLIERS

Survey no.	O05/115
Survey date	26 June 1994
Grid reference	O05 522 522
Area	1174 ha (655 ha forest, 519 ha shrubland)
Altitude	5–235 m asl

Ecological unit

- (a) Kahikatea–totara forest on hillslope
- (b) Nikau–puriri–towai forest on hillslope
- (c) Kanuka/manuka–totara forest on hillslope
- (d) Kahikatea–kanuka/manuka–totara forest on hillslope
- (e) Kanuka/manuka forest on hillslope
- (f) Taraire–towai forest on hillslope

Landform/geology

Occurs on dissected hill country underlain by Mangakahia Complex sandstone and siliceous mudstone.

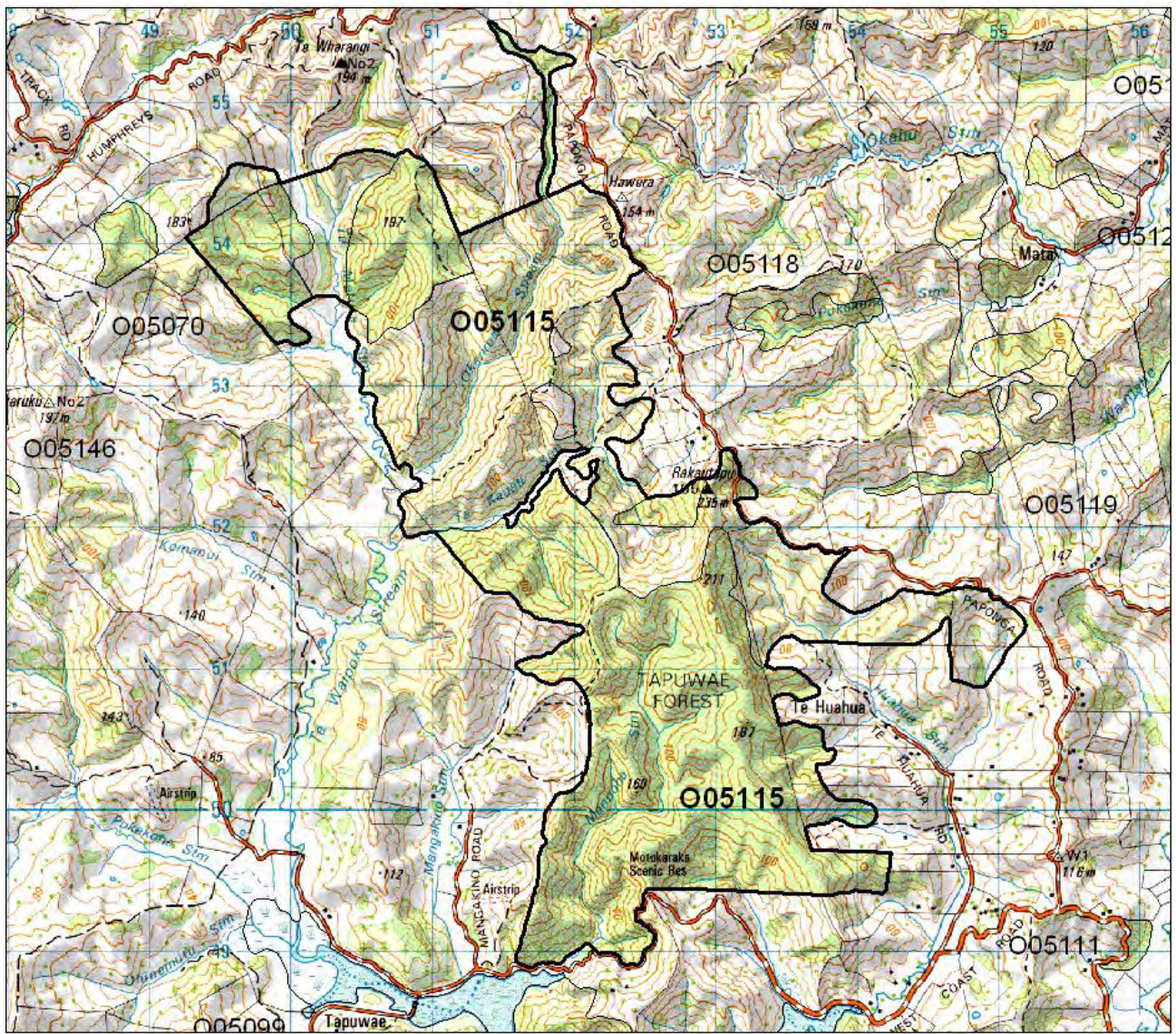
Vegetation

Young secondary forest dominates the central portion which provides a continuous forested link between the old-growth forest of the Motukaraka Scenic Reserve in the south to the remnant cutover forest at the north end of the site. This area has been adversely affected by logging which has removed the emergent element and broken up the canopy structure. Possum browse in this portion appeared to be particularly severe in 1994.

(a) Co-dominant kahikatea and totara occur beside the stream in the northern end of the site alongside Paponga Rd. Taraire is frequent and pukatea, puriri, ti kouka, rewarewa and puka are occasional.

(b) In the northern end of the main body of forest and shrubland nikau, puriri and towai are common with a range of frequent species including taraire, kahikatea, towai, totara and tanekaha. Pukatea, kohekohe, matai, rimu, rewarewa and northern rata are also present.

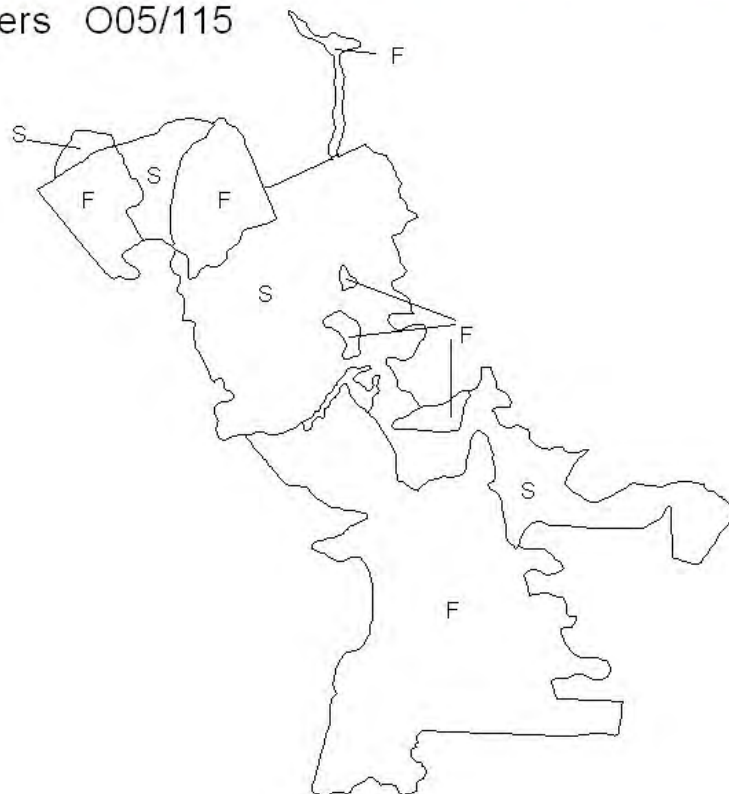
Type (a), kahikatea and totara occurs in this area with frequent tanekaha, towai and puriri. Rimu and matai are occasional.



Tapuwae Forest & Outliers O05/115

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



- (c) Larger areas of dominant kanuka/manuka and common totara occur with frequent towai and puriri. Kahikatea is sparse.
- (d) In the northwestern point of the main block kahikatea, kanuka/manuka and totara are associated with frequent puriri.
- (e) Around Okariro Stream and the northern side of Te Kauati Stream kanuka/manuka is abundant with frequent totara and occasional kahikatea and puriri.
- (f) At Motukaraka Scenic Reserve unlogged forest comprising taraire and towai occurs. Frequent species include emergent rimu and northern rata with kohekohe, puriri, and rewarewa. Occasional species include emergent kauri, kahikatea, matai and totara with miro, pukatea, tawa, hinau, kawaka, and swamp maire (gully).

Fauna

NI brown kiwi (Serious Decline) and kukupa (Gradual Decline).

Significance

The second largest remnant forest block in the Hokianga Ecological District and the largest on the north side of the harbour, Tapuwae Forest and its associated outliers is also one of the most diverse.

Representative site for type (a) kahikatea-totara forest, type (c) kanuka/manuka-totara forest, type (e), kanuka /manuka forest, type (f), taraire-towai unmodified forest occurring at Motukaraka Scenic Reserve and type (b) nikau-puriri-towai forest which is the only example of this type recorded in the Ecological District. Type (d) is also unrecorded elsewhere in the Ecological District.

Presence of threatened species.

A total of 812 ha (69%) of this site is protected by Stewardship Land and Scenic Reserve both administered by the Department of Conservation.

Motukaraka Scenic Reserve is a New Zealand soil site of regional importance for good examples of White Cone soils which are uncommon (Arand et al. 1993).

TE KARAE STATION REMNANTS

Survey no.	O05/116
Survey date	23 June 1994
Grid reference	O05 522 560, O05 525 569
Area	22 ha (18 ha forest, 4 ha shrubland)
Altitude	60-150 m asl

Ecological unit

- (a) Taraire forest on hillslope
- (b) Kahikatea-taraire-totara forest on hillslope
- (c) Kanuka/manuka shrubland on hillslope
- (d) Puriri-taraire-towai forest on hillslope
- (e) Kanuka/manuka-tanekaha-towai forest on hillslope

Landform/geology

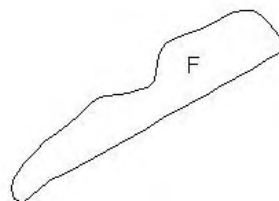
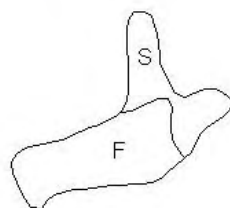
Two small remnants c. 350 m apart on dissected hill country underlain by Mangakahia Complex sandstone and siliceous mudstone.



Te Karae Station Remnants O05/116

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



Vegetation

The southernmost site is fenced and exhibiting good regeneration of canopy and understorey species.

(a) Abundant taraire occurs in the northern block and contains frequent puriri and rewarewa with occasional towai, titoki, pukatea, tawa and kohekohe.

(b) Kahikatea, taraire and totara are commonly associated in both blocks. Frequent species include puriri, nikau and tanekaha while titoki, towai, kohekohe, rimu, rewarewa and houhere are occasional.

(c) Kanuka/manuka shrubland occurs in the northern block.

(d) Puriri, taraire and towai are common in the southern block with frequent rewarewa and totara and occasional miro, tawari and tawa.

(e) Kanuka/manuka, tanekaha and towai are also represented in the southern block with frequent totara and occasional mamaku and puriri.

Significant flora

Tawari (Regionally significant species).

Fauna

Kukupa and kauri snail (both Gradual Decline).

Significance

Both forest remnants may have a role in linking the Tapuwae Forest site with the large forest tract of Raetea/Mangamuka.

Representative site for type (a), (b), (d) and (e). It is one of only two sites in the Ecological District where type (b) and (e) have been recorded.

Presence of two threatened and one regionally significant species.

MAUNGAPOHATU BUSH

Survey no.	O05/117
Survey date	14 June 1994
Grid reference	O05 570 570, O05 562 565
Area	321 ha (168 ha forest, 153 ha shrubland)
Altitude	0-202 m asl

Ecological unit

(a) Kanuka/manuka shrubland on hillslope (65%)

(b) Kanuka/manuka-towai forest on hillslope (5%)

(c) Kanuka/manuka-tanekaha-totara forest on hillslope (10%)

(d) Kanuka/manuka-totara forest on hillslope (15%)

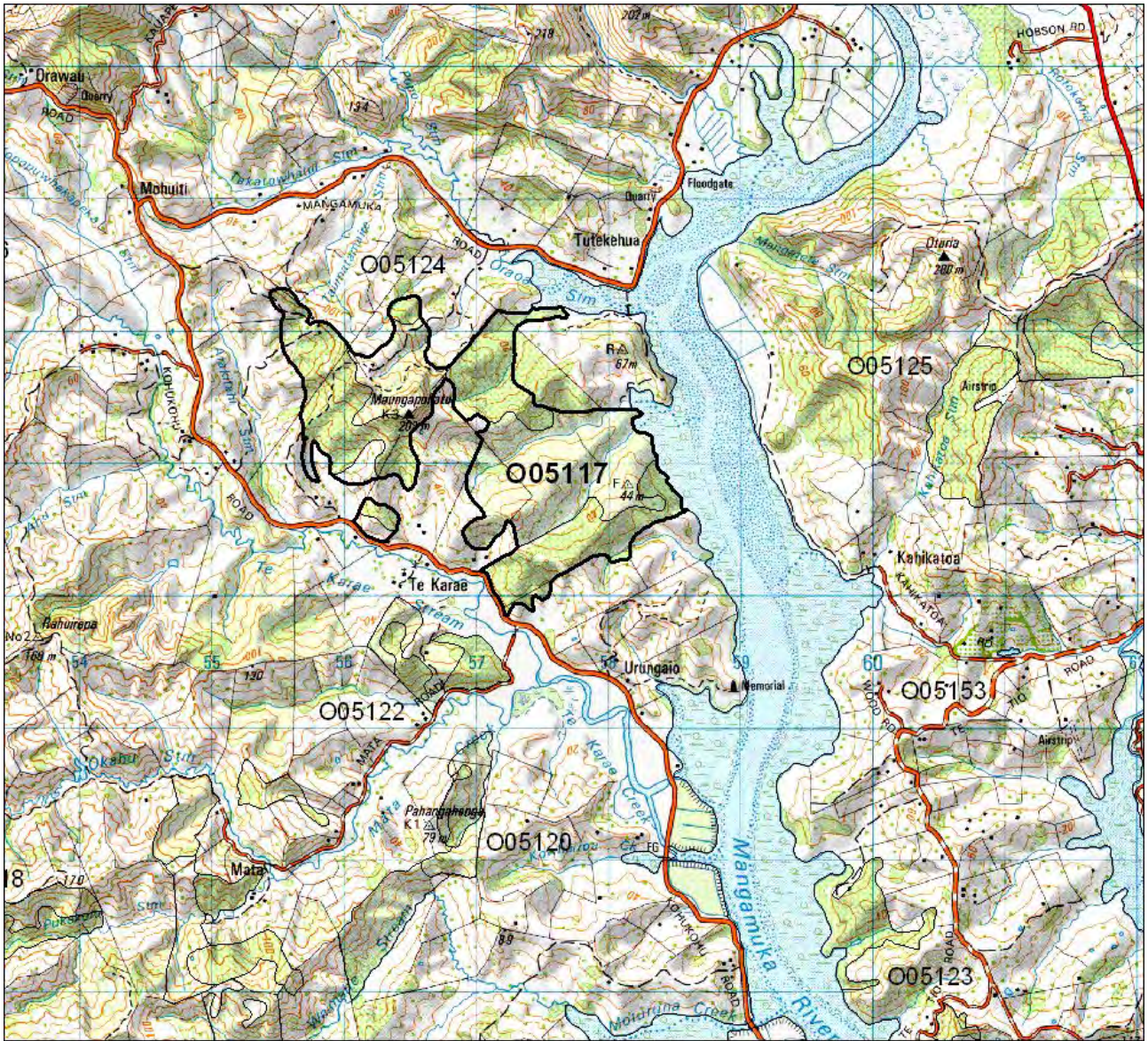
(e) Taraire forest on hillslope (5%)

Landform/geology

This large secondary forest and shrubland remnant is sited on dissected hill country running down to an estuarine portion of the lower Mangamuka River. It is underlain by Mangakahia Complex sandstone.

Vegetation

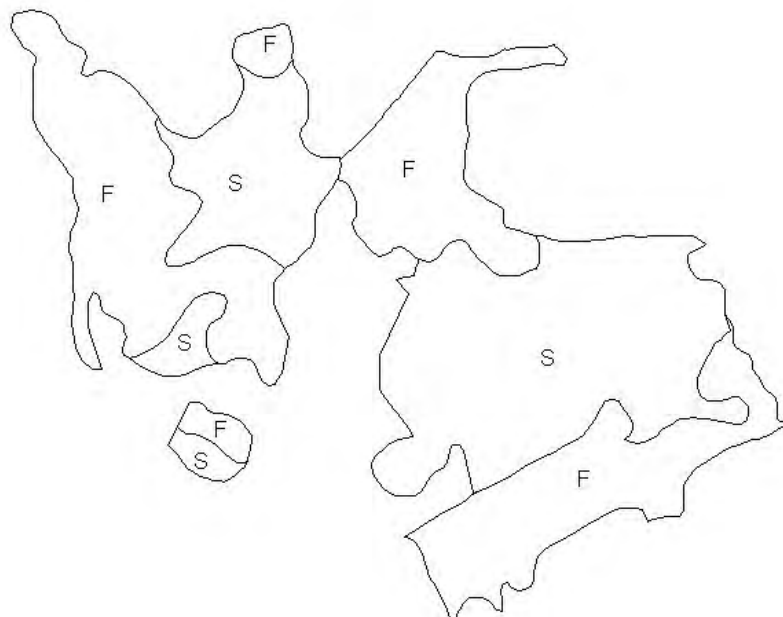
Generally young seral forest and shrubland with cutover old-growth forest in gully sites.



Maungapohatu Bush O05/117

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



- (a) Kanuka/manuka shrubland dominates the site with frequent puriri, totara, and ti kouka. Kahikatea and towai are occasional.
- (b) Over half of this site is abundant kanuka/manuka with common towai. Occasional species include puriri, mahoe, kahikatea and totara.
- (c) Kanuka/manuka, tanekaha and totara are commonly associated with the occasional mamaku, rewarewa and towai.
- (d) Kanuka/manuka and totara are common with frequent kahikatea and occasional puriri.
- (e) A small area of taraire forest occurs with towai, kahikatea, totara and rewarewa with occasional puka, nikau, rimu and emergent northern rata.

Significant flora

The green mistletoe *Ileostylus micranthus* (Regionally significant species) is present on scattered totara adjoining this site.

Fauna

NI brown kiwi (Serious Decline), kukupa (Gradual Decline), and kauri snail (Gradual Decline).

Significance

This site plays a major connecting role in the linkage which exists between Tapuwae Forest and the large forests of Raetea and Omahuta. Additionally, it provides riparian protection and ecological gradation from mangrove forest to more than 200 m asl.

Representative site for type (a) kanuka/manuka shrubland and type (b) kanuka/manuka-towai forest.

Presence of threatened and regionally significant species.

PUKEKOHE STREAM BUSH

Survey no.	O05/118
Survey date	23 June 1994
Grid reference	O05 536 535
Area	38 ha (18 ha forest, 20 ha shrubland)
Altitude	50-170 m asl

Ecological unit

- (a) Kanuka/manuka-totara forest on hillslope (20%)
- (b) Towai forest on hillslope (20%)
- (c) Taraire-towai forest on hillslope (20%)
- (d) Kanuka/manuka shrubland on hillslope (40%)

Landform/geology

This moderately sized site is lying amongst dissected hill country which is underlain by Mangakahia Complex sandstone.

Vegetation

A combination of cutover, secondary forest and shrubland. It is entirely fenced but stock are given access periodically.

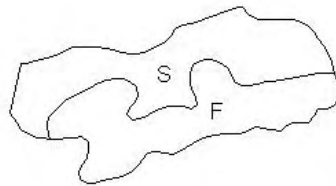
- (a) Kanuka/manuka and totara occur with frequent kahikatea and occasional towai, hinau, rewarewa and rimu.



Pukekohe Stream Bush O05/118

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



- (b) Towai is dominant and kahikatea, tanekaha, puriri and totara are occasional.
- (c) Taraire and towai are co-dominant while rewarewa is frequent and pukatea, puriri, tawa, puka and emergent rimu, kahikatea and northern rata are occasional.
- (d) The shrubland area is defined by kanuka/manuka with frequent totara and occasional kahikatea.

Fauna

NI brown kiwi (Serious Decline) and kukupa (Gradual Decline).

Significance

This site is one of several forest remnants forming a stepping stone linkage from the Tapuwae Forest through to the larger forests to the north. It contains a considerable element of emergents.

Representative site for type (c) taraire-towai forest.

Presence of threatened species.

The site also contributes to water and soil protection in the catchment, and is particularly important for its riparian values.

PAPONGA–MATA RD ASSOCIATION

Survey no.	O05/119
Survey date	24 June 1994
Grid reference	O05 548 534, O05 555 545
Area	126 ha (76 ha forest, 50 ha shrubland)
Altitude	c. 20–160 m asl

Ecological unit

- (a) Totara secondary forest on hillslope
- (b) Kanuka/manuka-totara forest on hillslope
- (c) Puriri-taraire forest on hillslope
- (d) Kanuka/manuka shrubland on hillslope

Landform/geology

One large remnant and one small remnant on dissected hill country underlain by Mangakahia Complex sandstone.

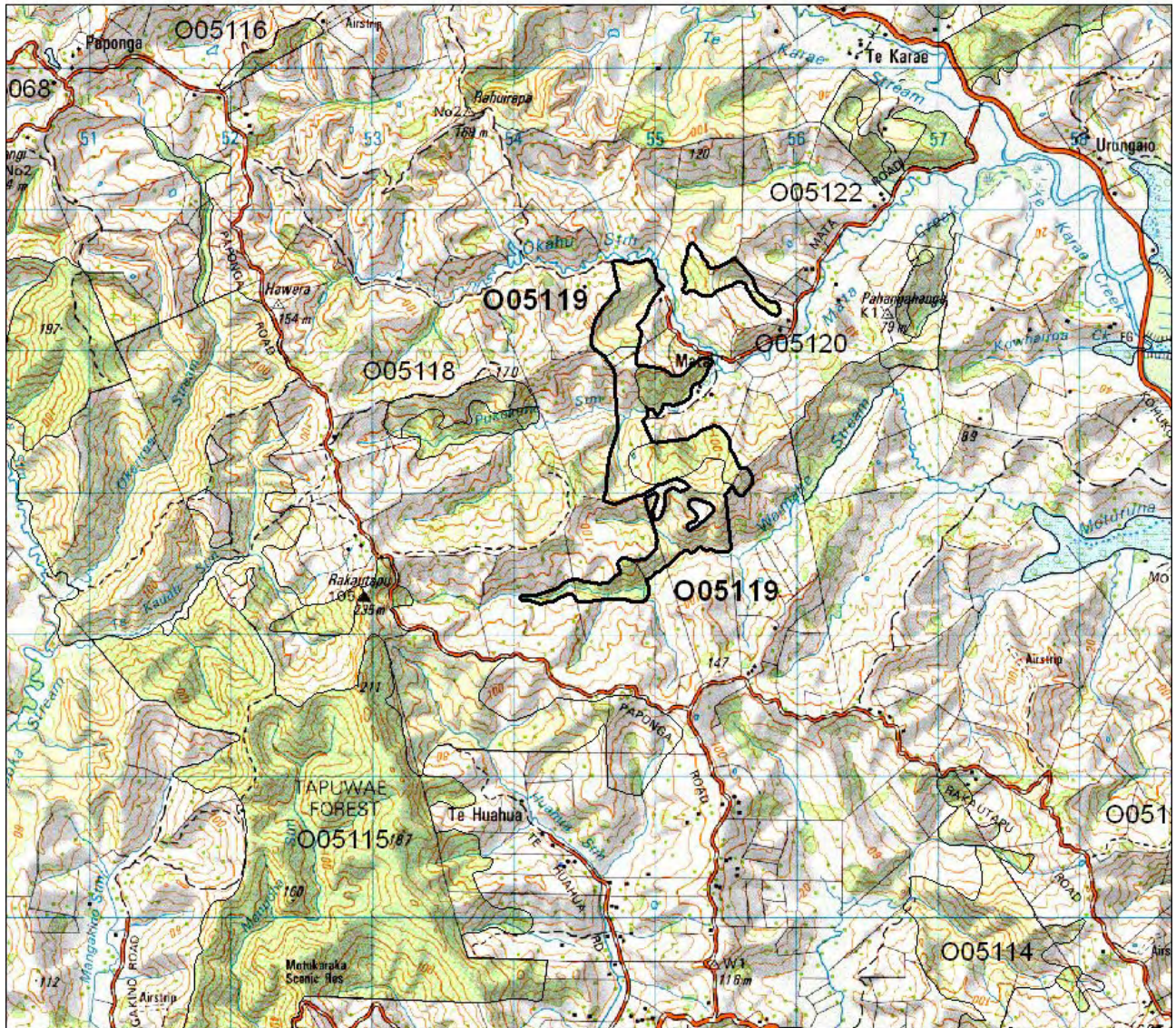
Vegetation

This site comprises a secondary forest/shrubland and cutover forest mosaic.

- (a) Abundant totara with occasional rimu, tanekaha and miro.
- (b) Kanuka/manuka and totara are associated with frequent nikau, towai, taraire and rewarewa and occasional kahikatea, miro, puriri and rimu.
- (c) Cutover puriri and taraire are common while kohekohe, totara and nikau are frequent. Occasional species include tawa, towai, hinau, karaka and emergent kahikatea and miro.
- (d) Kanuka/manuka occurs in the shrubland area with the occasional totara.

Fauna

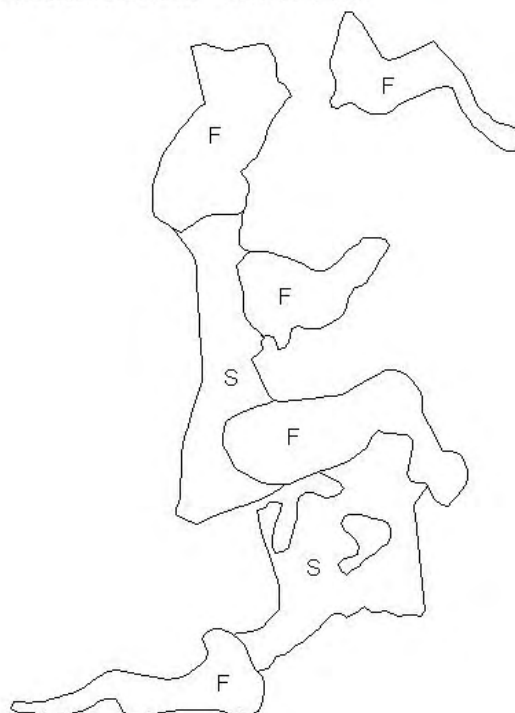
NI brown kiwi (Serious Decline) reported by southern block owner, kukupa (Gradual Decline). Northland tusked weta (Sparse), and forest gecko (*Hoplodactylus granulatus*) reported by the southern block owner.



Paponga-Mata Rd Association O05/119

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



Significance

The Paponga-Mata Rd association is also a crucial element in the chain of natural areas which together link the forests of Tapuwae with Raetea and Puketi – Omahuta Forests.

Representative site for type (a), totara forest and type (c), puriri-taraire forest.

Presence of three threatened species.

The site provides some upper catchment water and soil protection functions.

PAHANGAHANGA REMNANT

Survey no.	O05/120
Survey date	20 June 1994
Grid reference	O05 565 539
Area	64 ha (38 ha forest, 26 ha shrubland)
Altitude	c. 20-160 m asl

Ecological unit

- (a) Kanuka/manuka shrubland on hillslope (60%)
- (b) Kahikatea forest on alluvium (10%)
- (c) Kanuka/manuka-ti kouka swamp shrubland on alluvium (2%)
- (d) Kahikatea-totara forest on hillslope (28%)

Landform/geology

Alluvial flats in the Waimahe and Te Karae Creek valleys and on adjoining dissected hill country. It is underlain by Mangakahia Complex sandstone.

Vegetation

This site consists of alluvial forest and shrubland, secondary forest and advanced shrubland. The forest area is unfenced.

- (a) Kanuka/manuka shrubland comprises around half of the site with occasional kahikatea.
- (b) Abundant kahikatea occurs with occasional rewarewa, totara and titoki.
- (c) A small wetland area in which kanuka/manuka and ti kouka are dominant. Raupo and *Juncus* sp. are frequent.
- (d) Kahikatea and totara with frequent puriri and occasional ti kouka, pukatea and titoki.

Fauna

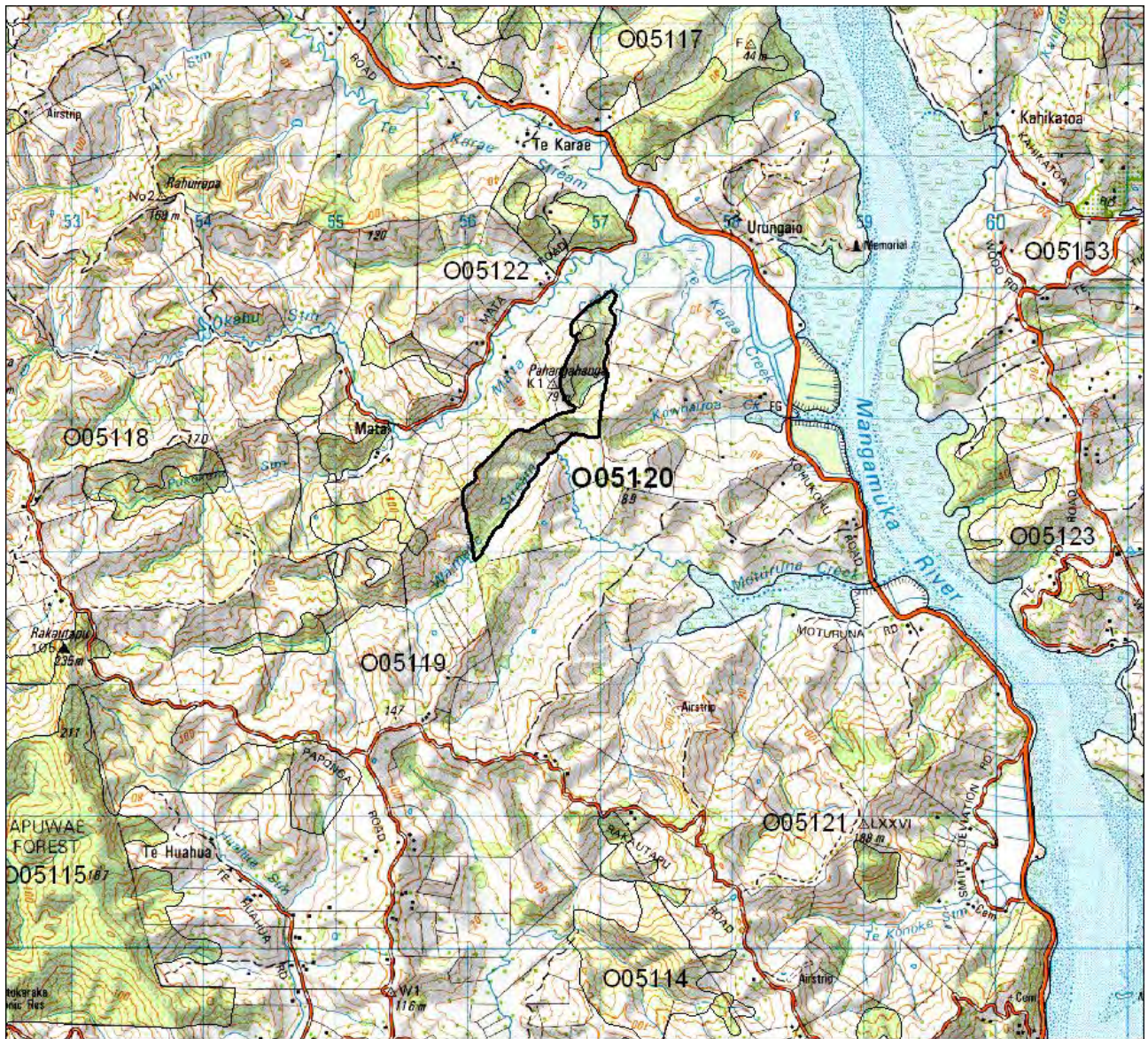
NI brown kiwi (Serious Decline) and Northland tusked weta (Sparse).

Significance

The location and diversity of forest/wetland types make it an important component of the remnant forest link joining Tapuwae Forest to Raetea/Puketi-Omahuta Forests.

It also provides suitable habitat for two threatened species. The site contributes to riparian water and soil protection.

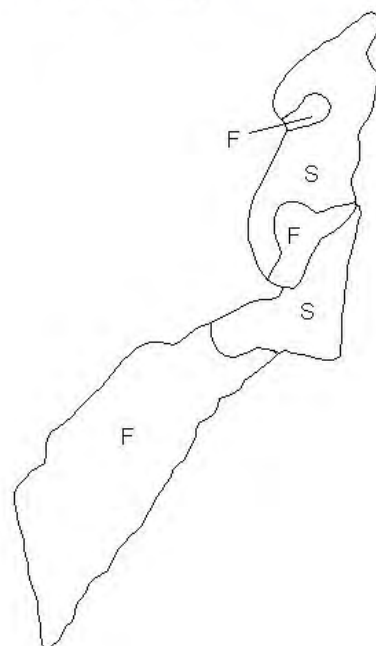
Representative site for type (c), kanuka/manuka-ti kouka swamp shrubland, which is also the only example of its type recorded in the Ecological District.



Pahangahanga Remnant O05/120

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



MATA RD INTERSECTION REMNANT

Survey no.	O05/122
Survey date	20 June 1994
Grid reference	O05 570 555
Area	34 ha (25 ha forest, 9 ha shrubland)
Altitude	< 20–80 m asl

Ecological unit

- (a) Kanuka/manuka-tanekaha-totara forest on hillslope (20%)
- (b) Tanekaha-taraire-totara forest on hillslope (40%)
- (c) Kanuka/manuka shrubland on hillslope (40%)
- (d) Raupo reedland in swamp (<1%)

Landform/geology

On dissected hill country underlain by Mangakahia Complex sandstone.

Vegetation

This site is composed of a range of secondary forest and wetland types.

- (a) Kanuka/manuka, tanekaha and totara occurs with frequent kahikatea and rewarewa. Rimu, matai, tawa, kowhai and emergent kauri and northern rata are occasional.
- (b) Tanekaha, taraire and totara are common while towai, puriri and rewarewa are frequent. Occasional species include miro, hinau, karaka, kowhai, rimu and kohuhu.
- (c) Kanuka/manuka shrubland occurs over c. 40% of the site.
- (d) There is a small raupo-dominant wetland.

Fauna

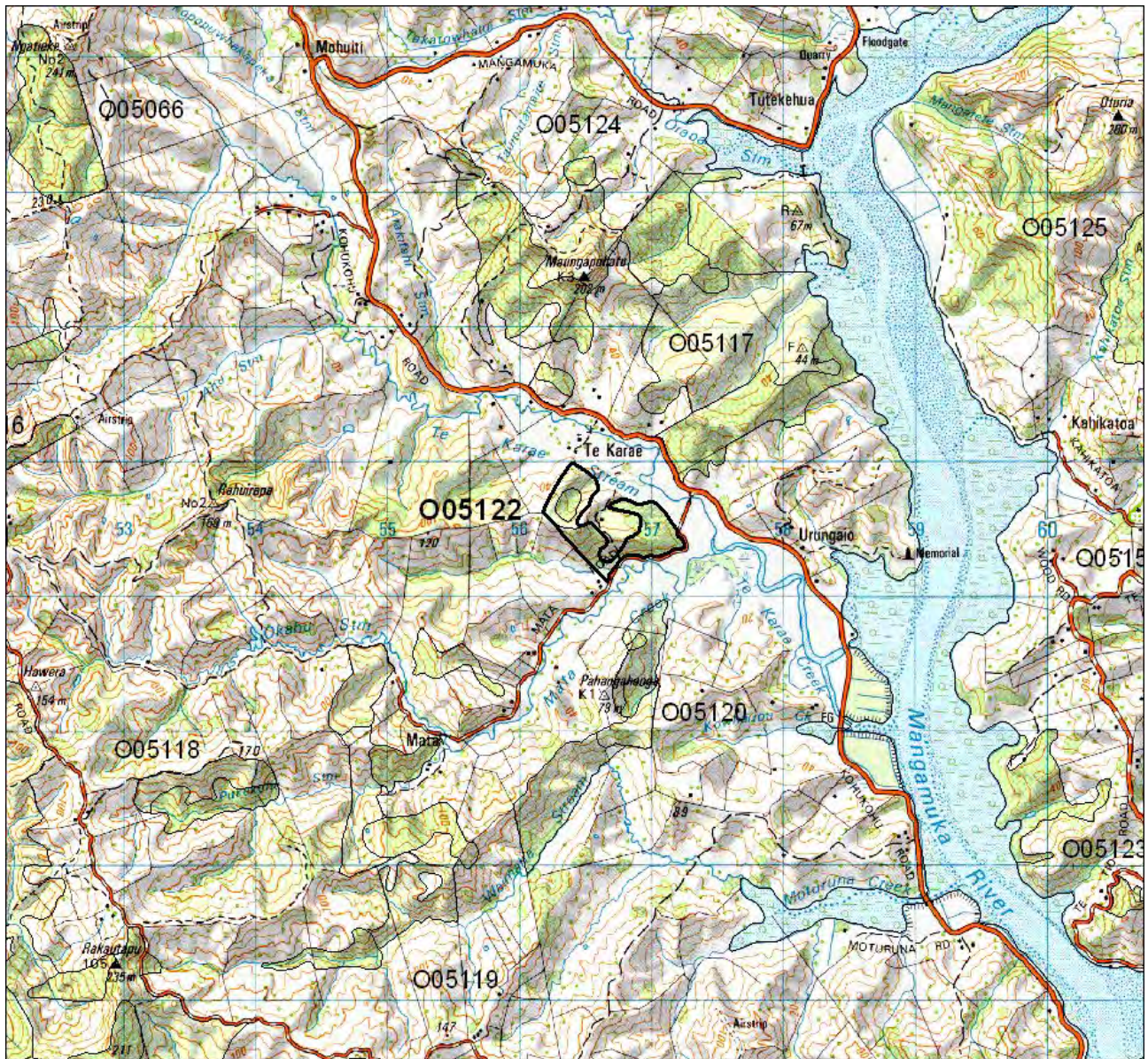
Kukupa (Gradual Decline) and common forest birds.

Significance

Forms another component of the remnant link running SW–NE from secondary hill-forest to freshwater wetland.

A representative site for type (a) kanuka/manuka-tanekaha-totara forest and type (b), tanekaha-taraire-totara forest, which is also unrecorded elsewhere in this Ecological District.

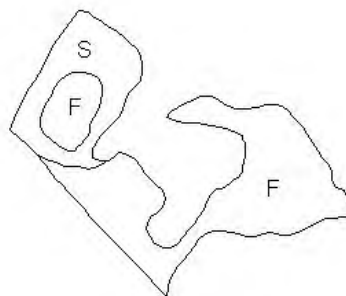
Habitat for the threatened kukupa.



Mata Rd Intersection Remnant O05/122

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



TE TIO RD BUSH

Survey no.	O05/123
Survey date	20 June 1994, 1997
Grid reference	O05 600 535 O05 606 527
Area	40.5 ha
Altitude	0-80 m asl

Ecological unit

- (a) Kanuka forest on coastal hillslope (70%)
- (b) Kanuka-tanekaha-totara forest on coastal hillslope (20%)
- (c) Puriri-tanekaha-taraire-totara forest on coastal hillslope (10%)

Landform/geology

Dissected hill country adjoining estuarine mangrove forest, this site is underlain by Mangakahia Complex sandstone.

Vegetation

- (a) The northern remnant is mostly kanuka forest with occasional totara and tanekaha.
- (b) The remaining area is kanuka, tanekaha and totara dominant with towai, kahikatea, rewarewa and puriri which are frequent. Kowhai, lancewood and taraire are occasional.
- (c) The southern remnant has a puriri, tanekaha, taraire, and totara canopy with occasional kahikatea. Nikau, kohekohe, kowhai, lancewood, houhere, karaka, pigeonwood, mapou and *Coprosma* spp. occur in the sub-canopy.

Fauna

Kukupu (Gradual Decline) and common forest birds have been recorded from the southern remnant. NI brown kiwi (Serious Decline) has been reported from the northern remnant.

Significance

The significance of this site is largely due to its riparian nature. Riparian sites such as this are very rare alongside the Hokianga Harbour, especially where the upper tidal margin adjoins flat alluvial land.

Representative site for all ecological units and the only record of type (b) and type (c) recorded in the Ecological District.

Approximately one hectare of this site is protected Stewardship Land administered by the Department of Conservation. The Queen Elizabeth II National Trust protects 3.8 ha of the southern remnant.

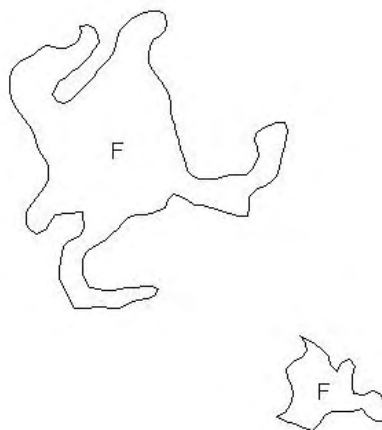
Presence of two threatened species.



Te Tio Rd Bush O05/123

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



ORAOA STREAM SALTMARSH

Survey no. O05/124
Survey date 23 June 1994
Grid reference O05 570 587
Area 1 ha
Altitude < 2 m asl

Ecological unit

(a) *Coprosma propinqua* swamp shrubland on estuary/alluvium (90%)



Oaroa Stream Saltmarsh O05/124

Each grid is 1000m x 1000m

and = 100 ha.

S = shrubland

F = forest

W = wetland

E = estuarine

D = duneland

(b) Raupo-harakeke association on estuary/alluvium (10%)

Landform/geology

Alluvium and estuarine deposits.

Vegetation

A very small upper saltmarsh/freshwater wetland ecotone which should be considered as part of the greater Hokianga estuarine habitat. It has been identified here mainly in order to signal the scarcity of this plant association and wildlife habitat type.

(a) *Coprosma propinqua* is common to abundant with frequent manuka and occasional ti kouka, kohuhu, kahikatea, mapou, harakeke, koromiko, totara, kowhai and raupo.

(b) Raupo is abundant in a small area with harakeke common. *Gabnia* sp. is occasional.

Pest plants include honeysuckle and pampas.

Fauna

NI fernbird (Sparse).

Significance

Of the c. 2400 ha (1978 figure) of reclamation which has occurred within the harbour, a large percentage would have been of this upper saltmarsh brackish wetland type where alluvium and a thick layer of organic soil has formed on top of estuarine deposits. These are the very areas which are critical as spawning sites for native galaxids (inanga, whitebait) and as nesting and feeding sites for wetland birds such as grey duck, Australasian bittern, crakes, rails and NI fernbird.

Representative site for both ecological units with type (b) unrecorded elsewhere in the Ecological District.

UMAWERA BUSH

Survey no.	O05/125
Survey date	14 June 1994
Grid reference	O05 607 575
Area	117 ha (94 ha forest, 23 ha shrubland)
Altitude	30-140 m asl

Ecological unit

(a) Kanuka-totara forest on hillslope (95%)

(b) Bracken-mahoe shrubland on hillslope (5%)

Landform/geology

This site is on dissected hill country underlain by Mangakahia Complex sandstone and mudstone.

Vegetation

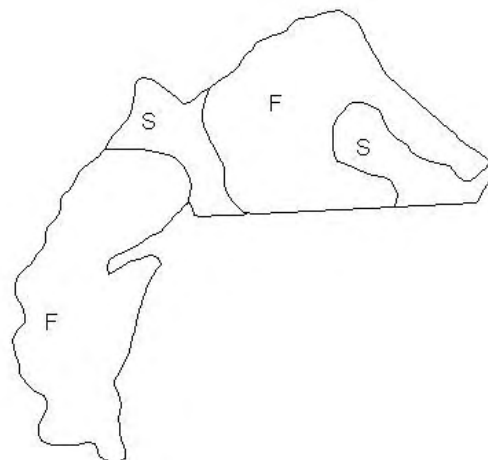
This site is closely associated with other natural areas to the north and west which occur in the adjoining Maungataniwha Ecological District. These areas have been located in this Ecological District due to the geological origin of the limestone country to the north. The southern forested area of the site is fenced.



Umawera Bush 005/125

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



(a) Kanuka and totara forest is common over most of the site with frequent kahikatea, puriri and taraire and occasional northern rata, rimu, tanekaha, pukatea, rewarewa, towai, matai, kauri, nikau, karaka, mamaku and titoki.

(b) Bracken and mahoe shrubland occurs with frequent mingimingi, wheki, mamaku, totara and occasional hangehange.

This shrubland forms an important linkage between the forested areas of the site.

Fauna

NI brown kiwi, reported by owner (Serious Decline), kukupa (Gradual Decline) and common forest birds.

Significance

The area is likely to have a role in linking the forests to the southwest with the adjacent Omahuta Forest.

It is a representative site for both ecological units and the only site in the Ecological District where type (b) bracken-mahoe shrubland is recorded, and is more suggestive of the Maungataniwha Ecological District which it borders.

Presence of two threatened species.

At least part of this site is fenced (in the southern area of the site).

The site contributes to upper catchment water and soil protection.

RANGIAHUA WETLAND

Survey no.	O05/128
Survey date	14 June 1994
Grid reference	O05 690 552
Area	12 ha
Altitude	<2 m asl

Ecological unit

(a) Harakeke-*Coprosma propinqua*-manuka-ti kouka swamp association on alluvium

Landform/geology

Alluvial and estuarine deposits.

Vegetation

This site is another small remnant of a once extensive transitional ecotone between alluvial swamp forest and true saltmarsh associations. It is influenced primarily by a high water table, high fertility and periodic inundation by brackish water during spring tides.

Harakeke is dominant with *Coprosma propinqua*, manuka and ti kouka in association. Raupo and crack willow are frequent and kowhai, kahikatea, *Coprosma robusta*, *C. tenuicaulis* and *Carex virgata* are occasional.

Fauna

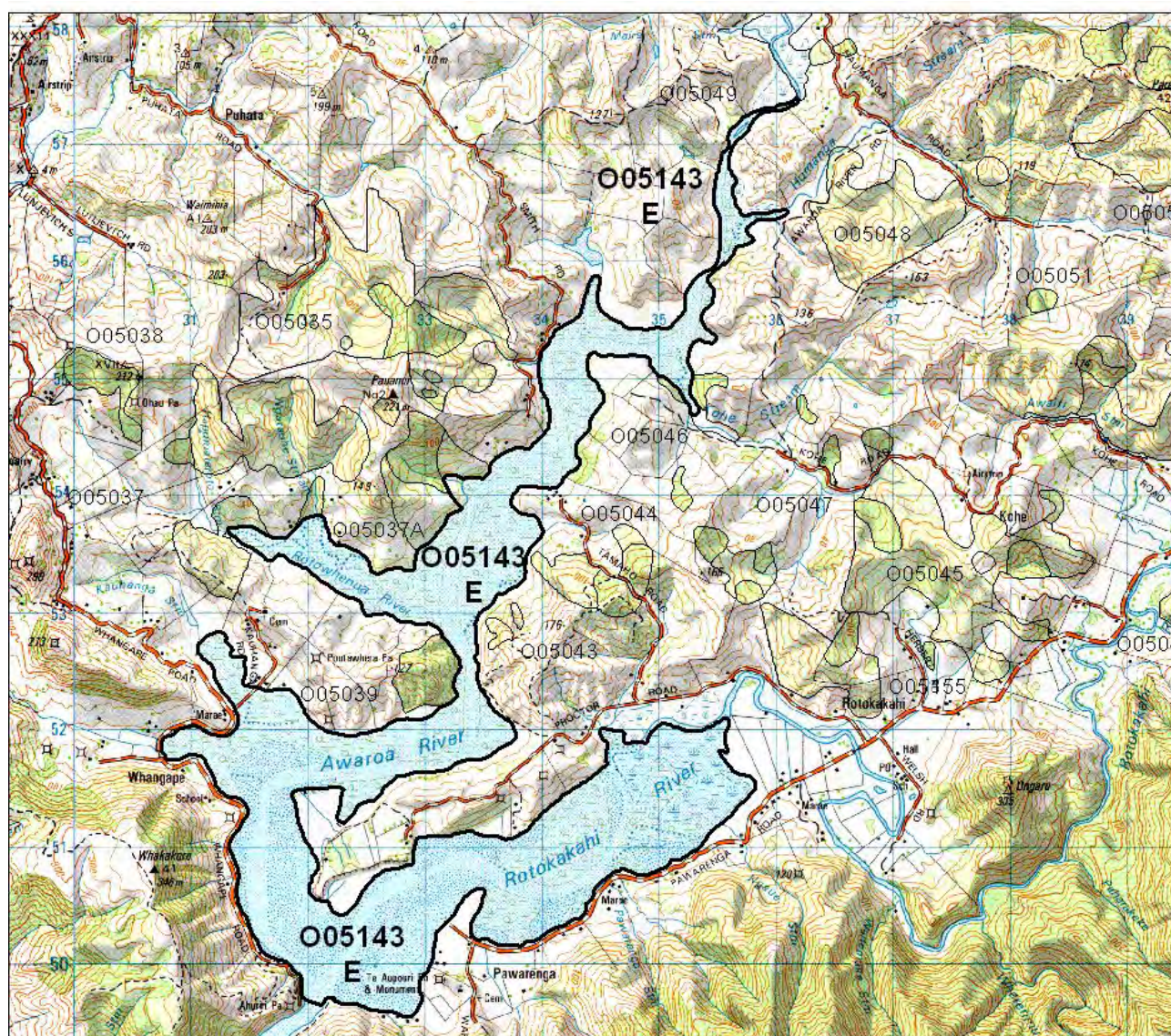
Not surveyed but sites of this nature are used extensively by spawning galaxids and wetland birds such as NI fernbird and banded rail which are known from sites further downstream.

WHANGAPE HARBOUR

Survey no. O05/143
 Survey date 16 January 1995
 Grid reference O05 334 534
 Area 916 ha
 Altitude sea level

Ecological unit

(a) Mangrove forest on estuary



Whangape Harbour O05/143

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

S = shrubland
 F = forest
 W = wetland
 E = estuarine
 D = duneland

- (b) Sea rush saltmarsh on estuary
- (c) Sea rush–mangrove association on estuary
- (d) Oioi–sea rush saltmarsh on estuary
- (e) *Juncus* sp.–oioi saltmarsh on estuary

Landform/geology

Deeply penetrating drowned river valley.

Vegetation

Tidal flats, saltmarsh and mangroves.

(a) On the Whangape side are tall mangroves with sea rush, bachelor's button and sea primrose on the landward edges.

At Pawarenga the mangroves are generally low. Livestock access to sand flats and type (b) sea rush saltmarsh and reclamation have degraded some of the habitat.

On the Awaroa River, the salt/freshwater interface is relatively undisturbed, generally with taller mangroves, type (a), fringing the channel and sea rush saltmarsh, type (b) on the landward edge.

At the Kohe Stream mouth type (c) occurs. Sea rush is abundant, mangroves common and oioi frequent.

Further towards Kohe Stream type (d) occurs. Oioi and sea rush are co-dominant with occasional mangrove, raupo and saltmarsh ribbonwood.

At the head of the Awaroa River about 40% of the wetland is type (b) sea rush with a small amount of raupo. There is a small percentage of type (d) sea rush and oioi with occasional mangrove. Type (e) raupo with frequent *Juncus* sp. comprises about 30% of the wetland, with the remainder grading into low manuka shrubland (see O05/049).

Fauna

Australasian bittern (Nationally Endangered), Northern NZ dotterel, banded rail and NI fernbird (all Sparse) and banded dotterel (Gradual Decline).

Significance

Although only c. 6% of the area retains significant riparian vegetation, the high proportion of intertidal area in this harbour contributes to its value as an ecosystem. The Awaroa arm retains a considerable degree of naturalness, particularly in the Rotowhenua River, Kohe and Humanga Streams and upper reaches.

The Rotokakahi River mouth is more modified, but the area of mangrove and saltmarsh remaining is sufficient to maintain productivity and be of significant habitat potential.

Representative site for all ecological units and only one of two sites in the Ecological District where type (b) and (c) are recorded.

Presence of at least five threatened species.

WAIWHAKARUKU BUSH

Survey no. O05/146
 Survey date 17 July 1995
 Grid reference O05 479 528
 Area 11 ha
 Altitude 120-160 m asl

Ecological unit

(a) Pukatea-taraire-towai forest on alluvium



Waiwhakaruku Bush O05/146

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

S = shrubland
 F = forest
 W = wetland
 E = estuarine
 D = duneland

Landform/geology

Hill country of Mangakahia Complex sandstone.

Vegetation

A mature podocarp-broadleaf remnant of towai, pukatea and taraire, with scattered tawa, puriri, rimu, kahikatea, rewarewa, nikau and northern rata.

The area has never been milled and contains several very large, mature rimu.

The understorey is sparse due to grazing and consists of common shrubs such as mahoe, putaputaweta, hangehange, kotukutuku and ferns such as wheki, thread fern, and *Deparia petersenii*. Parataniwha occurs in damper sites.

The pest plant *Elaeagnus* is present and is smothering some trees.

Fauna

Kukupa (Gradual Decline) and common forest birds.

Significance

Old-growth riparian podocarp-broadleaf forest is a rare habitat type and this area contains some of the largest rimu remaining in the Ecological District. Presence of a threatened species.

A representative site and only one of two sites in the District where pukatea, taraire and towai forest type is recorded.

ORIRA RIVER REMNANTS

Survey no.	O05/148
Survey date	3 May 1995
Grid reference	O05 626 546, O05 621 547, O05 637 528 O05 624 525, O05 615 517
Area	88 ha (22 ha forest, 66 ha shrubland)
Altitude	0-80 m asl

Ecological unit

(a) Manuka-totara shrubland on coastal hillslope

(b) Puriri-totara forest on coastal hillslope

Landform/geology

Occurring largely on dissected hill country underlain by Mangakahia Complex sandstone and mudstone.

Vegetation

A loosely associated group of five secondary forest and shrubland remnants within the Orira River catchment.

(a) Most of the area comprises two manuka and totara shrublands in which puriri is occasional and featuring c. 1.5 km of riparian edge.

(b) The other remnants are generally of an older secondary forest nature, puriri and totara forest with a riparian coastal/riparian influence. Kahikatea and titoki are frequent and northern rata, kohekohe, kowhai and taraire are occasional.

Fauna

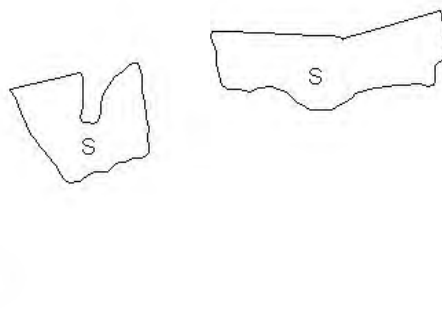
Not surveyed.



Orira River Remnants Q05/148

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



Significance

Representative site for and only record of type (b) puriri-totara forest in the Ecological District and a good example of coastal forest, although the understorey is mostly grazed out.

The site adjoins and provides a riparian buffer to the Orira River providing habitat for estuarine/wetland birds (see Hokianga Harbour (O05/152) for details).

RAWHIA REMNANTS

Survey no.	O05/149
Survey date	3 May 1995
Grid reference	O05 659 537, O05 642 521
Area	18 ha
Altitude	0-60 m asl

Ecological unit

- (a) Kanuka/manuka forest on coastal hillslope
- (b) Kanuka/manuka-totara forest on coastal hillslope
- (c) Kanuka/manuka-puriri forest on coastal hillslope

Landform/geology

Remnants on coastal hills underlain by Mangakahia Complex siliceous mudstone and adjoining tidal estuarine flats.

Vegetation

Two small remnants, adjoining the Waihou River.

- (a) Kanuka/manuka forest with occasional wattle.
- (b) Kanuka/manuka and totara are common with occasional kowhai and pine.
- (c) Kanuka/manuka and puriri are associated with frequent totara and occasional rewarewa.

Fauna

Not surveyed.

Significance

This site has coastal riparian value in a relatively early stage of succession and is a buffer to the upper reaches of the Hokianga Harbour.

Representative site for and only record of type (c) in the Ecological District, although the extent of this association is limited.

Marginal Strip of 2 ha administered by the Department of Conservation occurs within this site.



Rawhia Remnants O05/149

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

HAUTAU STREAM REMNANT

Survey no.	O05/151
Survey date	25 July 1995
Grid reference	O05 682 544
Area	55 ha (5 ha forest, 45 ha shrubland, 5 ha wetland)
Altitude	0-c. 100 m asl

Ecological unit

(a) Kanuka/manuka shrubland on coastal hillslope

- (b) Kanuka/manuka-tanekaha-totara forest on coastal hillslope
- (c) Towai forest on coastal hillslope
- (d) *Coprosma propinqua*-manuka-ti kouka swamp shrubland on alluvium
- (e) Oioi-saltmarsh ribbonwood association in estuary
- (f) *Coprosma propinqua* swamp shrubland on alluvium

Landform/geology

Mangakahia Complex siliceous mudstone and alluvium adjoining estuarine deposits.

Vegetation

A small area of freshwater marsh blending into true saltmarsh ribbonwood and seral riparian shrubland. Past drainage schemes and dykes have greatly reduced the area of this habitat type and, where it does remain, it is usually physically divorced from other transitional vegetation types, except saltmarsh.

- (a) Around 40% of the shrubland area is kanuka/manuka with frequent totara and ti kouka.
- (b) The rest of the shrubland area is kanuka/manuka, tanekaha and totara. Pine trees are frequent and rewarewa and kauri are occasional.
- (c) The forest in the western end is dominated by towai with frequent manuka and occasional rewarewa, ti kouka, totara, taraire and kahikatea.
- (d) *Coprosma propinqua*, manuka and ti kouka occur in the wetland area.
- (e) Oioi and saltmarsh ribbonwood occur in the saltmarsh with occasional raupo and marsh clubrush.
- (f) *Coprosma propinqua* is dominant in an area with occasional ti kouka and manuka.

Significant flora

Ileostylus micranthus (Regionally significant species).

Fauna

Birds: Australasian bittern (Nationally Endangered). High numbers of NI fernbird (Sparse), recorded in year 2000 SSBI survey, are known to frequent this site and it is probable that at least one of the New Zealand swamp rails (other than pukeko) will also utilise the area.

Fish: red-finned bully, inanga, and common smelt.

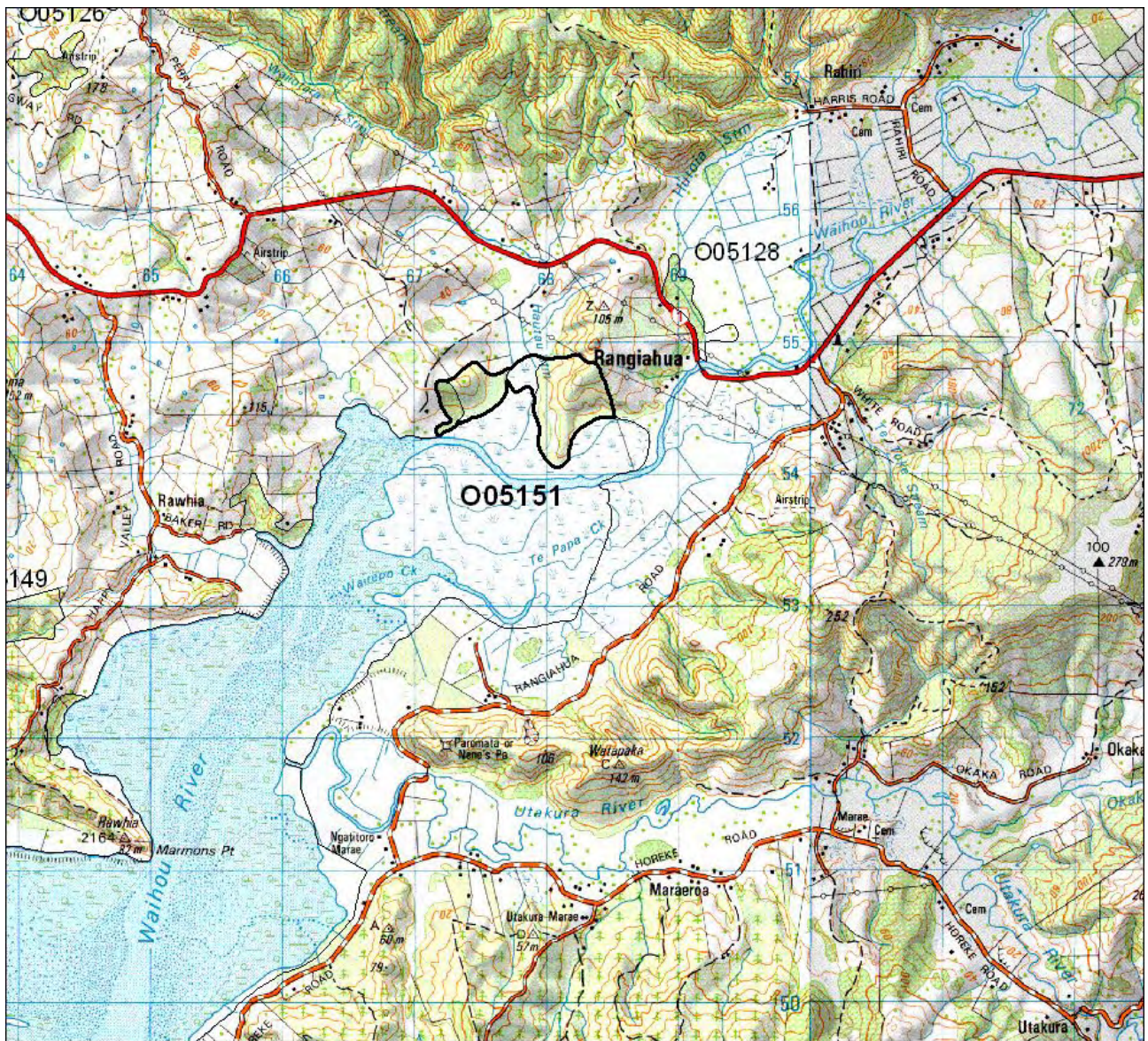
Significance

Representative site for all ecological units and a good example of a rare and diminishing habitat type as well as providing habitat for threatened species. Contains sequential gradients from hill country to brackish and saline wetland types.

It is the only site recorded in the Ecological District of type (e) and (f).

Presence of threatened species.

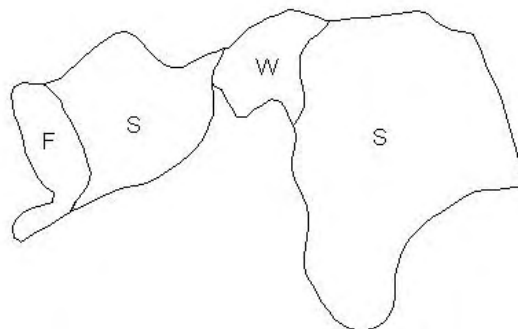
Approximately two hectares of the freshwater wetland is protected Stewardship Land administered by the Department of Conservation.



Hautau Stream Remnant O05/151

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



HOKIANGA HARBOUR

Survey no.	O05/152
Survey date	Various
Grid reference	O05 454 399, O05 559 450
Area	11, 065 ha
Altitude	sea level

Ecological unit

- (a) Mangrove shrubland and forest in estuary
- (b) Sea rush saltmarsh in estuary
- (c) Mangrove-sea rush association on estuary
- (d) Oioi saltmarsh in estuary
- (e) Oioi-sea rush saltmarsh in estuary
- (f) Bachelor's button-*Isolepis cernua*-sea primrose-*Selliera radicans* herbfield in estuary
- (g) Oioi-raupo-saltmarsh ribbonwood-sea rush association in estuary
- (h) *Coprosma propinqua* swamp shrubland in estuary
- (i) *Paspalum vaginatum* grassland in estuary
- (j) *Spartina alterniflora* grassland in estuary
- (k) Marsh clubrush sedgeland in estuary
- (l) Mud and sandflats on estuary
- (m) Rock platforms

Landform/geology

The fourth largest estuarine harbour in New Zealand, the Hokianga Harbour is an old drowned river valley which has become a 'bar-built' estuary with the deposit of sands at the harbour entrance.

This Harbour covers approximately 11, 065 ha of which about 6500 ha is exposed at low tide. Of this intertidal area, approximately 2900 ha is vegetated, leaving approximately 3600 ha of bare tidal flats. However, the area of intertidal vegetation had been reduced by approximately 2400 ha or 45% (V. J. Chapman 1978) by 1977 due to reclamation for pastoral farming - some of it without legal authority. This is a reduction of total intertidal area of approximately 27%. Many vegetated areas continue to be degraded by frequent livestock grazing.

Vegetation

(a) Mangrove shrubland and forest is the most common vegetation type, fringing the main channels and shores. Davis & Bellingham (1984) estimate that this harbour contains 14% of the mangroves in New Zealand.

Tall mangroves up to 12 m occur in the Mangamuka River and at Tapuwae. Taller mangroves usually occur along the tidal channels, with smaller plants up to 2 m tall occurring on the inland side, with open spaces of bare ground.

A dense understorey of mangrove seedlings usually occurs under the taller trees. Type (e), sea rush-oioi saltmarsh, may be found beneath low mangroves and type (h), *Paspalum* grassland under taller mangroves. Type (a), mangrove shrubland/forest frequently grades into type (b), sea rush saltmarsh.

(b) Sea rush is mostly found in the middle and lower harbour, where it dominates saltmarshes. Clumps of oioi and occasional mangroves may occur with patches of sea primrose, *Selliera radicans*, *Triglochin striatum*, *Isolepis cernua* and pohuehue on better drained areas.

(c) Sea rush is common amongst mangroves under 1 m tall. Sparse vegetation of tall mangrove, sea rush and occasional low mangroves is found on the east of the Whirinaki River and from Onoke to Koutu.

(d) Oioi sedgeland is common in the brackish upper reaches of the harbour e.g. Waihou River and Tapuwae, where dense swards up to 1.5 m tall occur, with occasional scattered mangrove trees. Saltmarsh ribbonwood fringes the channels and occasional patches of raupo and sea rush are present.

(e) Oioi and sea rush occur in the Whirinaki River and upstream from Horeke. Isolated mangrove may occur.

(f) Saline tolerant herb species such as bachelor's button, *Isolepis cernua*, sea primrose, and *Selliera radicans* are generally found near the land edge, sea primrose is the most common and bachelor's button is common where reclamation has occurred. *Triglochin striata* and *Paspalum vaginatum* may also be present.

(g) Sea rush, oioi, raupo, and saltmarsh ribbonwood association occurs mainly in brackish areas of the Mangamuka, Waihou, Waima and Orira Rivers. *Coprosma propinqua*, manuka and harakeke may be scattered throughout.

(h) *Coprosma propinqua* is dominant at Rangiahua where the regionally significant plant *Ileostylus micranthus* is found.

(i) *Paspalum vaginatum* forms dense swards on higher ground and beneath taller mangroves. This type is found at Matawhera.

(j) Dense swards up to 1 m of the tall environmental weed *Spartina alterniflora* cover tidal flats beneath mangroves on the Waima and Wairere Rivers, and along the shoreline at Mangungu, and at Tapuwae. *S. x townsendii* is found locally on tidal flats in the middle and lower harbour with sea rush.

(k) A small amount of marsh clubrush sedgeland occurs along riverbanks in the upper reaches of the rivers, e.g. Whirinaki and Waihou. Small, dense stands of marsh clubrush to 2 m tall occur with scattered *Coprosma propinqua*, raupo, harakeke and giant umbrella sedge.

Significant flora

Pimelea arenaria and pingao (both Gradual Decline), *Korthalsella salicornioides* (Sparse), *Olearia solandri*, *Ileostylus micranthus* and black maire (all Regionally significant species).

Fauna

Birds: White heron (Nationally Critical), Australasian bittern and reef heron (both Nationally Endangered), Caspian tern (Nationally Vulnerable), grey duck (Serious Decline).

Banded dotterel, white-fronted tern and northern little blue penguin (breeding harbour entrance) (all Gradual Decline).

Pied shag, black shag, little black shag, banded rail, spotless crane, marsh crane, NI fernbird (large numbers at Rangihua Reserve in 2000) and northern NZ dotterel (all Sparse).

Other regulars include royal spoonbill (Coloniser), variable oystercatcher (Regionally significant species), grey-faced petrel (breeding harbour entrance), bar-tailed godwit, lesser knot, South Island pied oystercatcher, pied stilt, paradise shelduck, cattle egret and many other common species.

Fish: giant bully (Regionally significant species), red-finned bully, common bully, Cran's bully, inanga, common smelt, short-finned eel, long-finned eel (Gradual Decline). Short-jawed kokopu (Gradual Decline) have been recorded in catchment waters.

Lizards: Pacific gecko (Gradual Decline) from Waihou River and shore skink.

Significance

The Hokianga Harbour and its many arms and tidal streams (c. 156,000 ha) which feed into the harbour support populations of over 30 species of waterbird.

The Hokianga Harbour has a perimeter length in the order of 280 km of which approximately 40 km (c. 14%) includes sites which perform riparian functions and have other ecological values in their own right. This figure compares well with other west coast harbours such as Whangape which only retains c. 6.3% of its significant native riparian cover.

All ecological units are representative except type (i) and (j) and many do not occur elsewhere in the Ecological District – type (b), (c), (f), (g), (k), (m), (n), and (o) with type (d) recorded at only one other site in the Ecological District.

The Hokianga Harbour is known to support populations of three threatened and three regionally significant plants, and at least 16 threatened bird species are present around the Harbour. Historically, it has also supported populations of the threatened brown teal (Nationally Endangered) (Ogle 1982)) and the Critically Endangered herb *Sebaea ovata*, but these species have not been confirmed for some time.

It has been suggested that the Hokianga Harbour supports 8% of the national population of the threatened Australasian bittern (Nationally Endangered) and 20% of the national population of banded rail (Sparse) (Davis and Bellingham 1984).

At 11, 065 ha, the Hokianga Harbour has the largest intertidal area of any Northland harbour except the Kaipara, despite having lost c. 27% of this zone to reclamation.

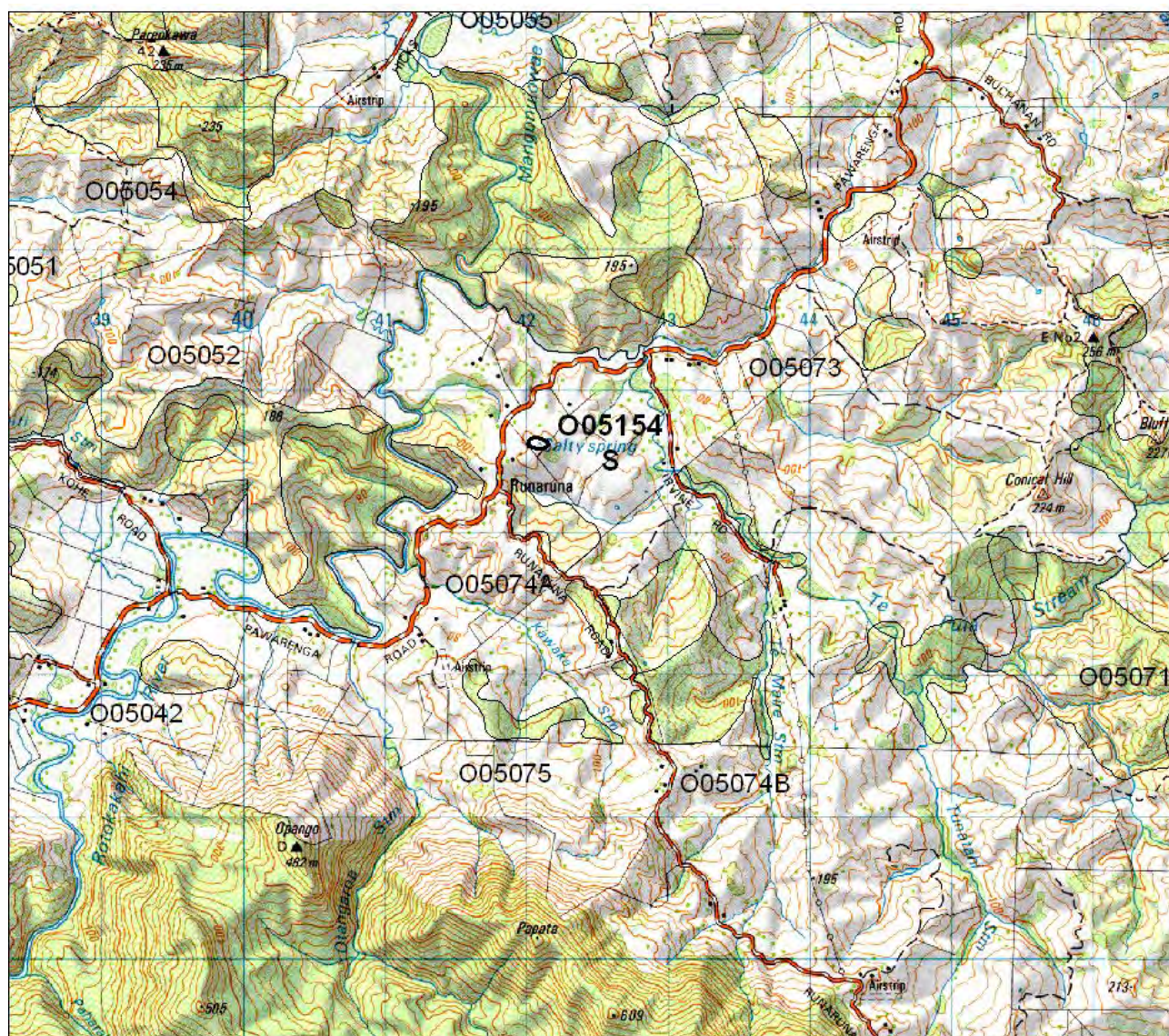
The Hokianga Harbour displays a sequential zonation from old-growth hill country forest through to secondary forest, shrubland, riparian forest and marshy zones into true saltmarsh and mangrove forest, which eventually grade into mud and sand flats before culminating in the mobile dune sands of North Hokianga Head.

In the national context, the Hokianga is undoubtedly one of the best remaining examples of a large northern harbour with a largely forested upper catchment (c. 30%) which has retained good examples of riparian forest, shrubland and marsh.

Threats to the Harbour include the pest plant *Spartina*, livestock grazing and trampling of saltmarsh, sediment deposition and turbidity derived from erosion in the catchments, and reduced water quality from effluent and pastoral run-off.

Survey no.	O05/154
Survey date	28 June 1993
Grid reference	O05 421 546
Area	1 ha
Altitude	c. 80 m asl

Volcano



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

154

Landform/geology

Mud-spring volcano surrounded by extensive area of silts, muds and grits deposited by spring activity.

The volcano is 3 m high with multiple vents that release a mixture of carbon dioxide, methane and some water (Kenny & Hayward 1996).

There is no vegetation on the volcano, with the mud having high levels of salt and boron.

Fauna

Not surveyed.

Significance

The Runaruna mud volcano is ranked as a nationally important geological site and landform as it is the only active mud volcano in Northland (Kenny & Hayward 1996).

HERBERT RD SWAMP FOREST

Survey no.	O05/155
Survey date	17 February 1995
Grid reference	O05 373 526
Area	2 ha
Altitude	< 20 m asl

Ecological unit

Kahikatea-pukatea-ti kouka forest on alluvium

Landform/geology

Swamp on alluvium.

Vegetation

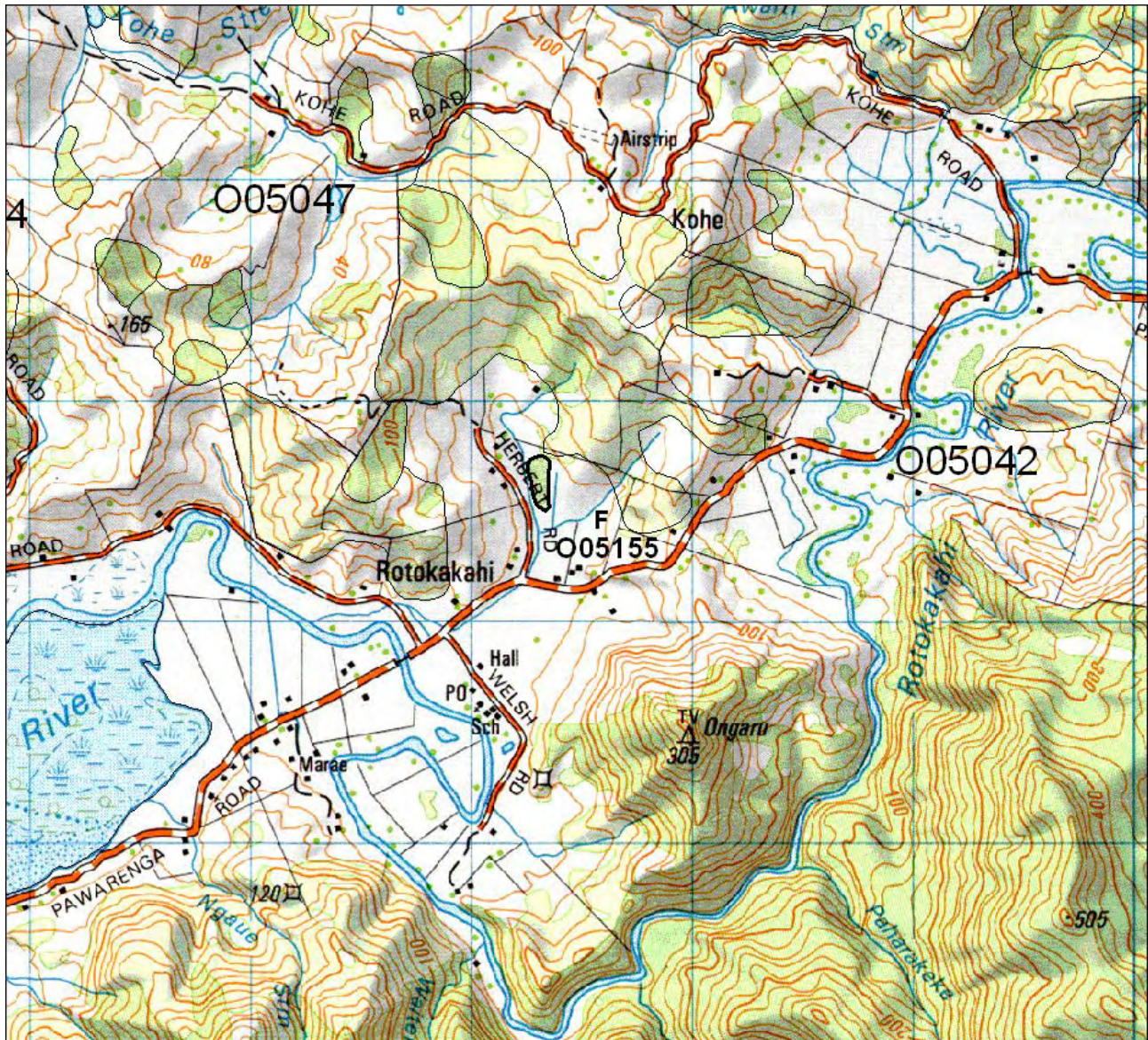
A small remnant of lowland flood forest consisting of kahikatea, pukatea, and ti kouka and occurs on the flats at Herbert Rd.

Fauna

Not surveyed.

Significance

Representative site although severely degraded, the swamp forest remnant is a very rare forest type and only one of two examples recorded in the Ecological District.



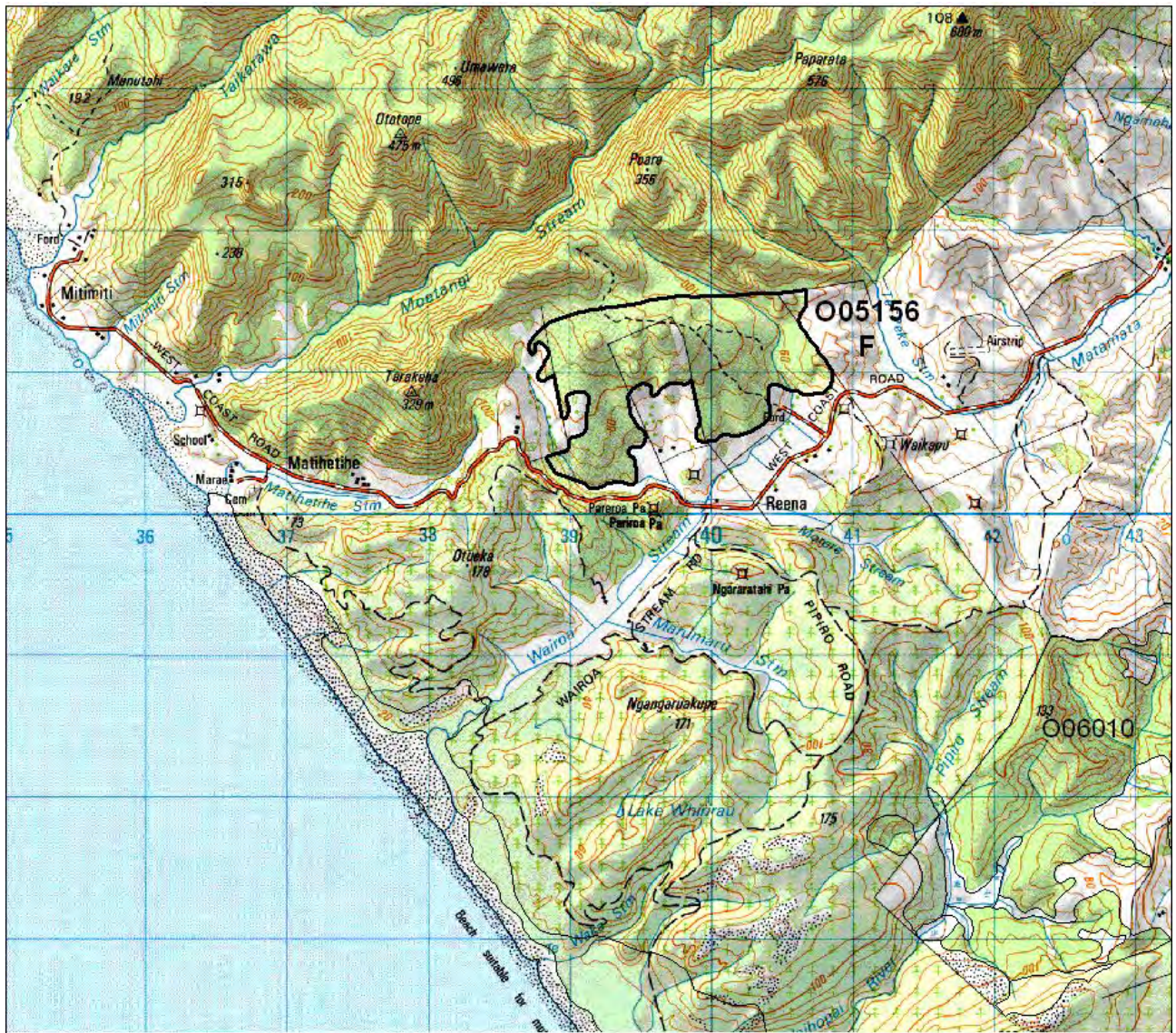
Herbert Rd Swamp Forest O05/155

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

REENA BUSH

Survey no.	O05/156
Survey date	c. 1996/97
Grid reference	O05 391 408
Area	165 ha
Altitude	20-160 m asl



Reena Bush O05/156

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

Ecological unit

Kanuka/manuka forest on moderate to gentle hillslope

Landform/geology

Giant landslide of predominantly Tangihua Complex material over Mangakahia Complex sandstone.

Vegetation

Secondary kanuka-manuka forest in an advanced stage of succession with frequent emergent kahikatea, ti kouka, puriri, towai and rewarewa. Mamangi is locally frequent. Other species present include kowhai, putaputaweta, mahoe, kauri, toru and rimu.

Significant flora

Australina pusila (Regionally significant species).

Fauna

NI brown kiwi (Serious Decline) has been reported at this site.

Significance

Contiguous with Warawara Forest (Ahipara Ecological District) this is one of the largest and best representative examples of kanuka/manuka succession in the Ecological District.

Presence of a threatened and regionally significant species.

The Department of Conservation administers 3 ha of this site as Conservation Covenant.

OPARA RD QEII REMNANT

Survey no.	O05/157
Survey date	25 May 1995
Grid reference	O05 524 402
Area	20.7 ha
Altitude	0-80 m asl

Ecological unit

Manuka-tanekaha forest on coastal hillslope

Landform/geology

Steep hillslope on Mangakahia Complex sandstone and mudstone.

Vegetation

Manuka and tanekaha are co-dominant with taraire, puriri and kohekohe mostly occurring in the gullies. Rimu and rewarewa are conspicuous on the ridges while kahikatea, lancewood, nikau and ti kouka occur near the coastal edge.

Fauna

NI brown kiwi (Serious Decline) and kukupa (Gradual Decline).

Significance

A representative secondary coastal forest remnant grading from hill forest to harbours edge. Riparian remnants adjacent to the Hokianga Harbour are priority areas for protection.

Presence of two threatened species.

The manuka-tanekaha forest type is unrecorded elsewhere in the Ecological District.

A Queen Elizabeth II National Trust Open Space Covenant protects 10 ha of this site.



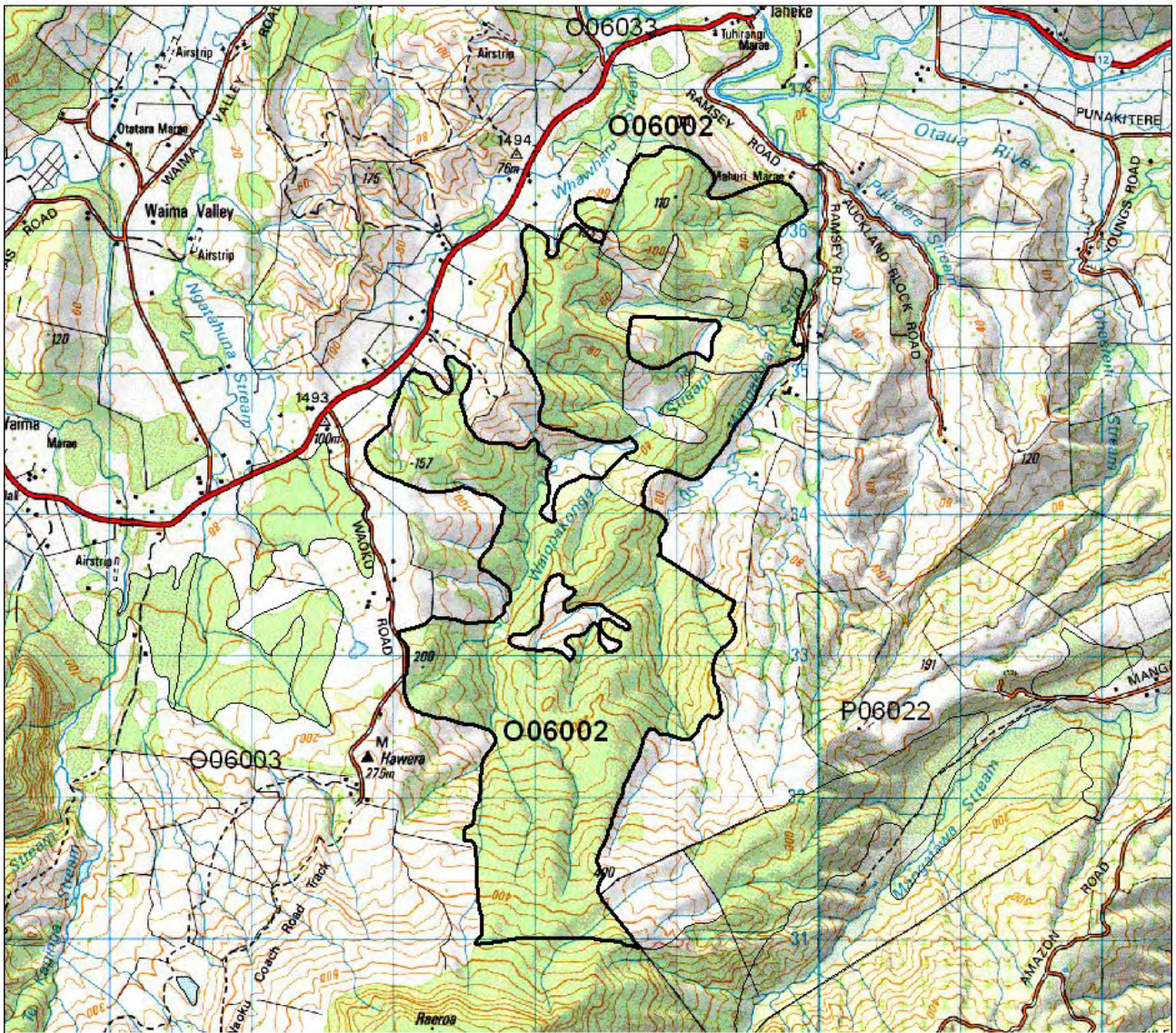
Opara Rd QEII Remnant O05/157

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

NORTHERN MATARAUA FOREST

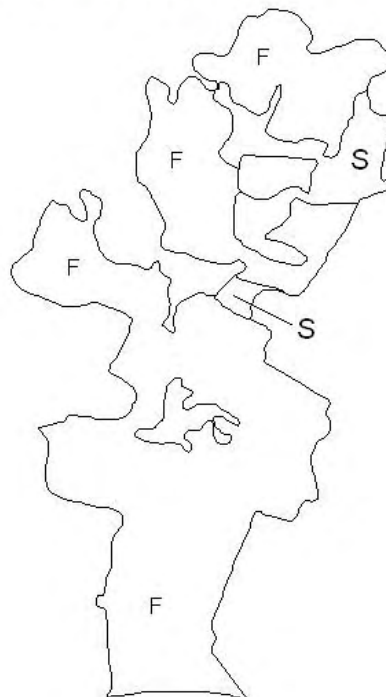
Survey no.	O06/002
Survey date	3 May 1994
Grid reference	O06 683 337
Area	796 ha (706 ha forest, 90 ha shrubland)
Altitude	10-c. 400 m asl



Northern Mataraua Forest O06/002

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



Ecological unit

- (a) Pukatea-taraire-towai forest on hillslope
- (b) Kahikatea-towai forest on hillslope
- (c) Manuka shrubland on hillslope

Landform/geology

The site is geologically distinct from the parent tract (Waipoua basalt plateau), being on dissected Mangakahia Complex sandstone hill country.

Vegetation

Another large extension of the Waipoua-Waima-Mataraua Forest tract, but lying within the Hokianga Ecological District. Forest types reflect the mid to low altitudes, adding considerably to the altitudinal range encompassed by this generally upper altitude forest tract. The northern portion has undergone repeated historical modification, but is still linked by secondary forest and shrubland to the main tract. It is important that this tenuous link is maintained or enhanced in order to retain the altitudinal sequences represented.

- (a) Pukatea, taraire and towai are common with frequent rewarewa, puriri and emergent northern rata. Rimu, tawa and nikau are occasional.
- (b) Kahikatea and towai are co-dominant with frequent pukatea, puriri and occasional northern rata, rimu and taraire.
- (c) An area of manuka shrubland occurs.

Fauna

NI brown kiwi (Serious Decline) has been reported at this site.

Significance

An important site for maintaining the full altitudinal range associated with the Mataraua Plateau. Representative site for type (a) pukatea-taraire-towai forest which has only been recorded in one other site in this Ecological District and type (b) kahikatea-towai forest.

The site also contributes to water and soil protection in the catchment, and is particularly important for its riparian values.

WAOKU RD BUSH

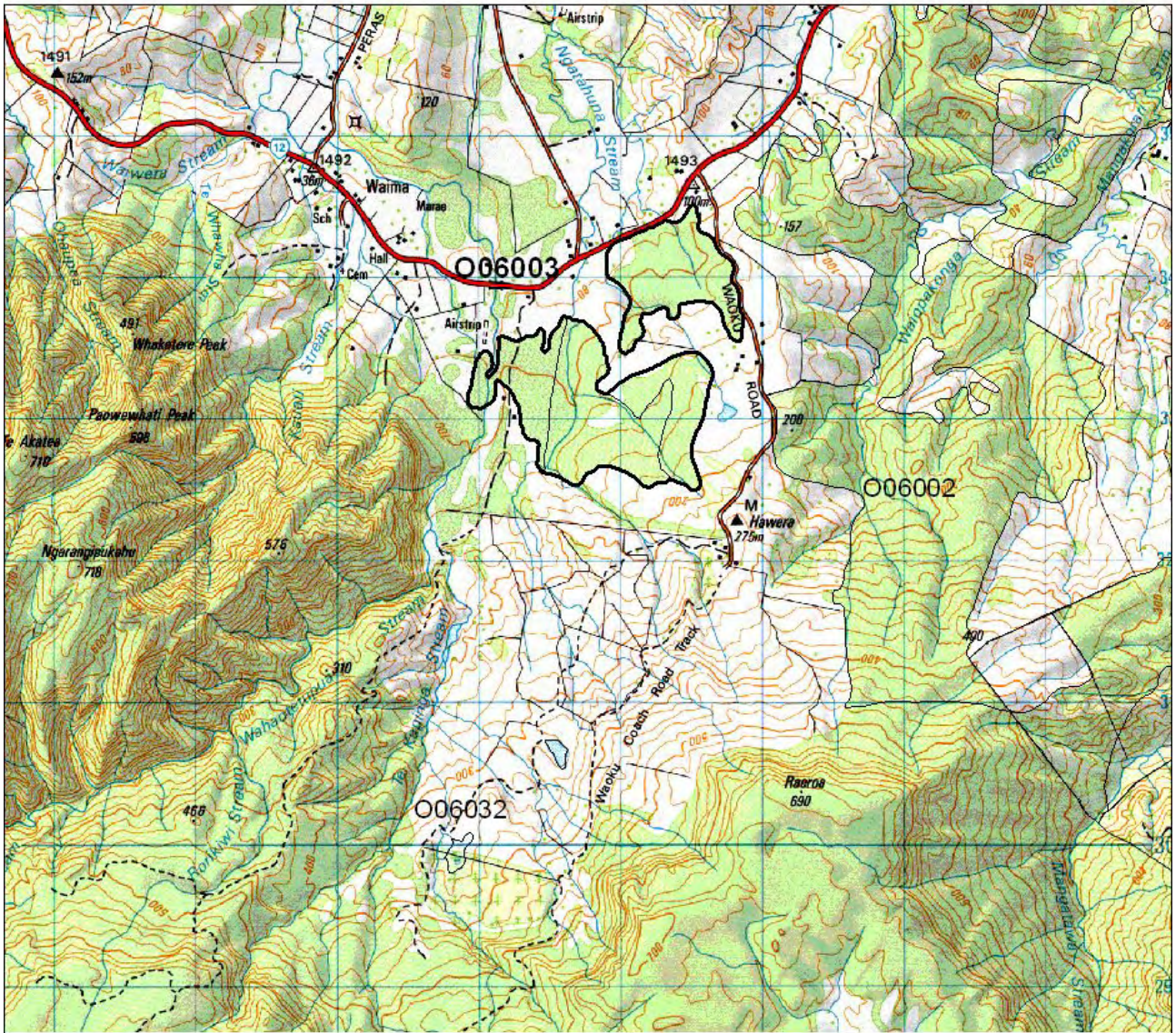
Survey no.	O06/003
Survey date	3 May 1994
Grid reference	O06 663 339, O06 657 331
Area	175 ha (114 ha forest, 61 ha shrubland)
Altitude	c. 70-200 m asl

Ecological unit

- (a) Kahikatea-pukatea-taraire forest on gentle hillslope (70%)
- (b) Kahikatea secondary forest on alluvial terrace (10%)
- (c) Manuka shrubland on hillslope (20%)

Landform/geology

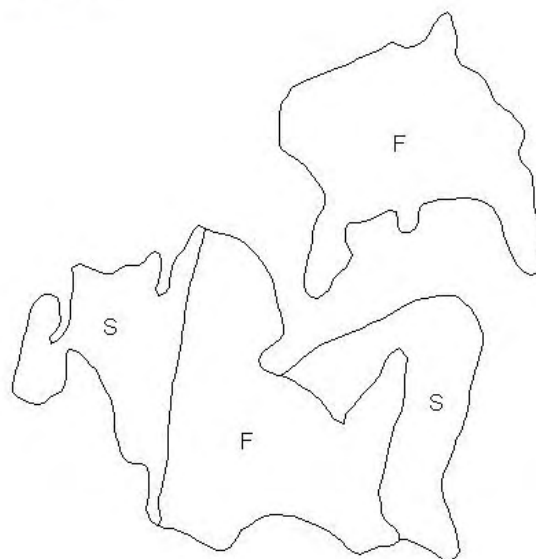
Situated on low relief hill country and quarternary alluvial terraces, it is underlain by Mangakahia Complex sandstone and mudstone with alluvial terraces in the west.



Waku Rd Bush 006/003

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



Vegetation

(a) Most of the site is an association of kahikatea, pukatea and taraire. Northern rata and rewarewa are frequent while kauri, rimu, puriri, puka and nikau are occasional.

(b) Kahikatea is dominant with the occasional rewarewa and rimu.

(c) Areas of manuka dominant shrubland are giving way to emergent kahikatea and ti kouka and will, if left to regenerate, provide additional podocarp dominant lowland forest.

Fauna

NI brown kiwi (Serious Decline) has been reported at this site and common forest birds.

Significance

This large secondary outlier to Waima Forest is one of the best examples of lowland alluvial podocarp dominant forest remaining within this Ecological District and is representative site with type (a) unrecorded elsewhere in the Ecological District.

It is linked and/or closely associated with the Waima Forest tract.

It also provides a riparian function.

Marginal Strip, administered by the Department of Conservation occupies 2 ha of this site.

CLASSENS/DUDDYS BUSH

Survey no.	O06/004
Survey date	2 May 1994
Grid reference	O06 603 399, O06 627 408, O06 625 414 O06 634 381, O06 619 408
Area	2130 ha (1640 ha forest, 467 ha shrubland, 23 ha wetland)
Altitude	0-c.150 m asl

Ecological unit

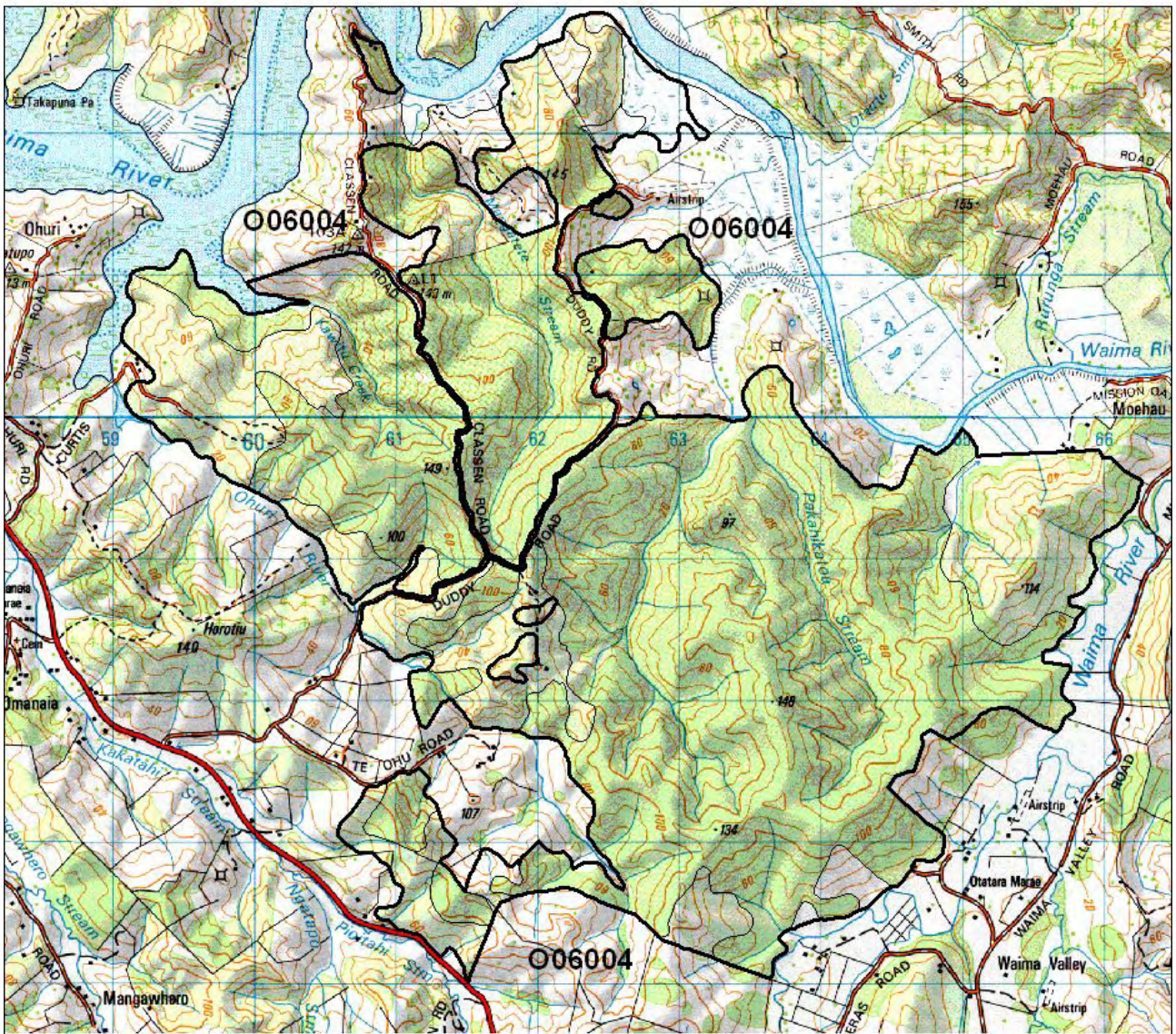
- (a) Taraire forest on hillslope
- (b) Kahikatea-rewarewa-taraire forest on hillslope
- (c) Towai forest on hillslope
- (d) Kanuka-towai forest on hillslope
- (e) Manuka shrubland on hillslope
- (f) Raupo reedland in swamp
- (g) Oioi saltmarsh in estuary

Landform/geology

This large site occupies dissected hill country underlain by Mangakahia Complex sandstone, running into marine sediments adjoining the Waima River.

Vegetation

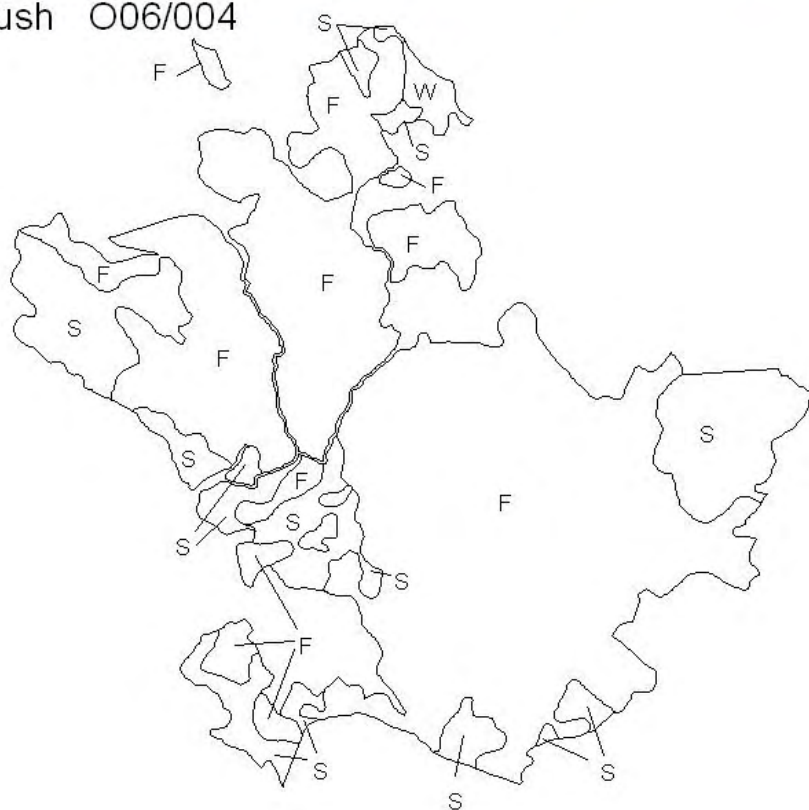
This forest is heavily modified having been cut over for kauri and podocarps at least twice, but has regenerated well.



Classens/Duddys Bush O06/004

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



- (a) Cutover taraire forest with frequent towai, rewarewa, pukatea, puriri, kahikatea and totara and occasional rimu, northern rata and tawa.
- (b) Kahikatea, rewarewa and taraire are co-dominant with frequent pukatea and nikau and occasional northern rata, kanuka, puka and rimu.
- (c) Towai occurs with frequent taraire, puriri, pukatea, kahikatea, and rewarewa. Rimu, miro and northern rata are occasional.
- (d) Kanuka and towai are common with frequent rewarewa, kahikatea, puriri and occasional pukatea, rimu and tanekaha.
- (e) Manuka shrubland occurs with emergent tanekaha and occasional emergent rimu and kahikatea.
- (f) On the Waima River an area of raupo occurs with occasional ti kouka.
- (g) Abundant oioi occurs with frequent raupo and occasional pampas.

Towai and manuka generally dominates the more disturbed periphery, while taraire is dominant in the more intact catchments. Totara die-off is evident, presumably due to possum browse. Goats are present in moderate numbers and livestock are also present.

Significant flora

Urtica incisa (Regionally significant species) approaching its northern limit of distribution.

Fauna

Birds: NI brown kiwi (Serious Decline), kukupa (Gradual Decline) and NI tomtit (Regionally significant species) in low numbers. NZ dabchick (Sparse) have also been recorded from within this habitat.

Fish: 1999 record of banded kokopu (Regionally significant species), inanga, common smelt, eel (species not known) and the pest fish *Gambusia*.

Significance

The forest exhibits a very good altitudinal sequence running, in places, into the wetland, saltmarsh and mangrove associations of the Waima River. Its large size and close proximity to the large Waipoua-Waima-Mataraua Forest tract potentially increases its viability.

Presence of threatened and regionally significant species.

Representative site for type (b), which is unrecorded elsewhere in the Ecological District and type (c), (d), (e), (f) and (g).

Contributes to water and soil protection in the catchment.

UPOKOWHAWHA FOREST REMNANT

Survey no.	O06/006
Survey date	5 May 1994
Grid reference	O06 550 355
Area	11 ha
Altitude	40-160 m asl

Ecological unit

- (a) Kahikatea forest on alluvium (20%)
- (b) Kahikatea-nikau-puriri-taraire forest on hillslope (80%)

(b) The majority of the site contains co-dominant kahikatea (some emergent), nikau, puriri and taraire forest with frequent pukatea. Puka, rimu, rewarewa, karaka, titoki and kohekohe are occasional.

Fauna

Not surveyed.

Significance

Representative site for type (a) old growth kahikatea forest, a very rare forest type within this Ecological District, and type (b), kahikatea-nikau-puriri-taraire forest which is also unrecorded elsewhere in the District.

The remnant is unfenced.

An upper catchment and riparian protection function is present.

KARANGI BUSH REMNANTS

Survey no.	O06/007
Survey date	5 May 1994
Grid reference	O06 558 374, O06 550 372
Area	39 ha
Altitude	20-120 m asl

Ecological unit

(a) Kahikatea forest on gentle hillslope (50%)

(b) Taraire-pukatea-puriri forest on hillslope (50%)

Landform/geology

Two forest remnants on dissected hill country underlain by Mangakahia Complex sandstone.

Vegetation

(a) Kahikatea with frequent puriri, pukatea and occasional totara and kanuka.

(b) Taraire is dominant with pukatea and puriri common. Kahikatea, rewarewa, and nikau are frequent while rimu, karaka and totara are occasional.

Fauna

Not surveyed.

Significance

Contains a sequential gradient from broadleaf dominant hill forests to podocarp dominant in the lower, flatter sites. Representative site for type (b).



Karangi Bush Remnants O06/007

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

VUJCICH RD SWAMP

Survey no.	O06/008
Survey date	5 May 1994
Grid reference	O06 534 374
Area	3 ha
Altitude	< 5 m asl

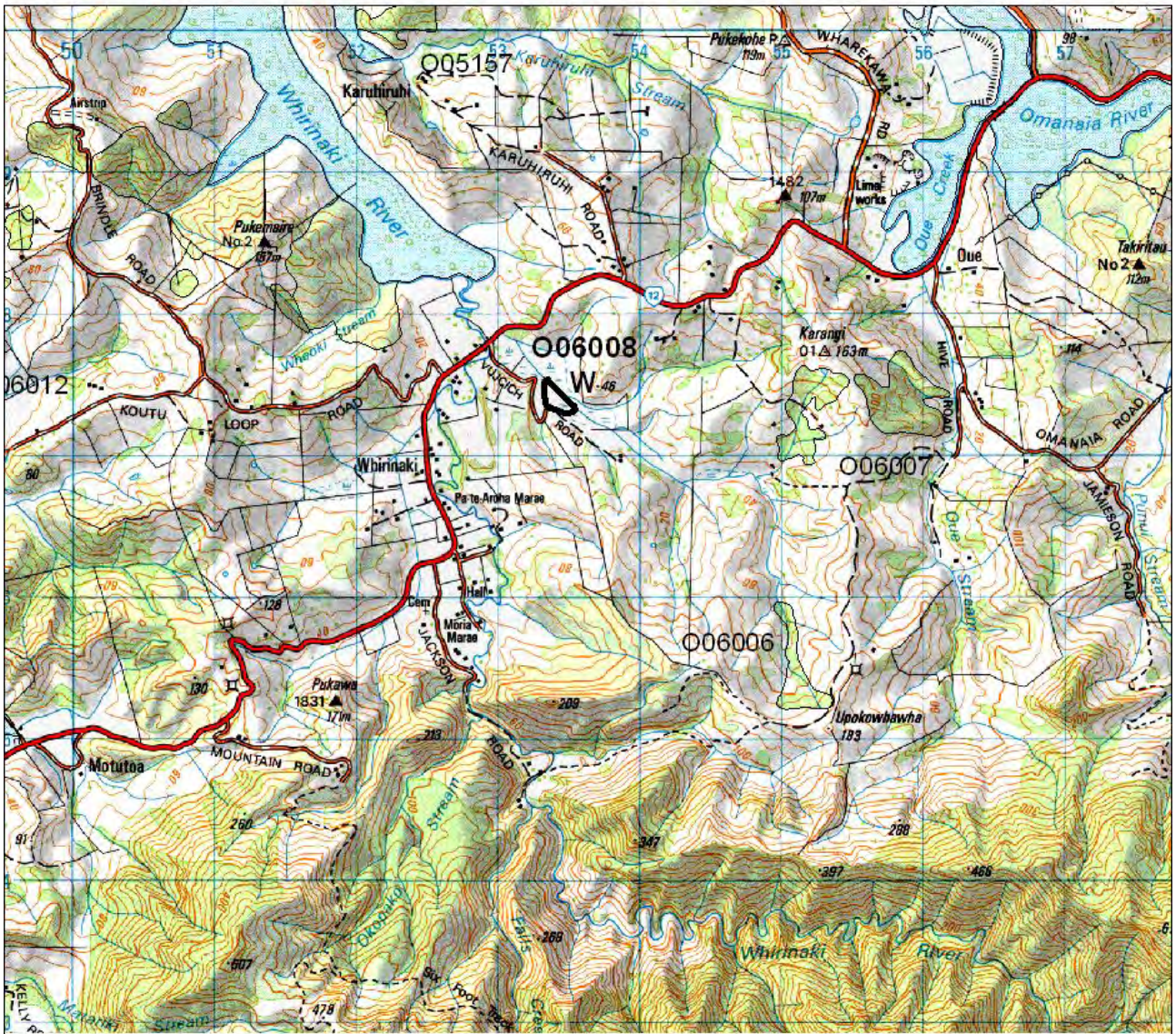
(a) Harakeke-raupo-ti kouka association in swamp

Landform/geology

The site occurs on Holocene alluvial estuarine deposits.

Vegetation

This small and partially drained swamp was originally part of a larger wetland/saltmarsh system. Saltmarsh ribbonwood is frequent suggesting a saline influence at the upper edge of a saltmarsh which is now almost completely “reclaimed” for pastoral farming.



Vujcich Rd Swamp O06/008

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

Fauna

Not surveyed.

Significance

Representative of a mineralised freshwater wetland type with brackish influence. Freshwater and brackish wetlands of this nature are now extremely uncommon due to reclamation/drainage for pastoral farming and the association of harakeke, raupo and ti kouka is unrecorded elsewhere in the Ecological District. The appearance of drier swamp vegetation is due to the effects of adjacent drains.

Sites like these are known to be important spawning areas for native freshwater fish such as banded kokopu (Regionally significant species) and inanga, and also wetland birds like Australasian bittern (Nationally Endangered).

WHEOKI STREAM/PUKEMAIRE REMNANTS

Survey no.	O06/009
Survey date	4 May 1994
Grid reference	O06 507 393, O06 507 382, O06 498 391 O06 507 388, O06 518 382
Area	135 ha (40 ha forest, 95 ha shrubland)
Altitude	0-157 m asl

Ecological unit

- (a) Nikau forest on coastal hillslope
- (b) Kahikatea-kowhai-manuka-puriri forest on coastal hillslope
- (c) Taraire-tanekaha forest on coastal hillslope
- (d) Manuka-kauri-mamangi forest on coastal hillslope
- (e) Puriri-taraire forest on coastal hillslope
- (f) Kahikatea-tanekaha forest on coastal hillslope
- (g) Mamaku-nikau-ti kouka forest on coastal hillslope
- (h) Manuka shrubland on coastal hillslope

Landform/geology

The area is dissected hill country with Holocene alluvial/estuarine deposits in the valley of Wheoki Stream, and Mangakahia Complex sandstone underlying the hill country.

Vegetation

This moderate-sized forest remnant exhibits a large range of semi-coastal mixed podocarp/broadleaf/kauri vegetation types reflecting a range of historic modifications and physical influences.

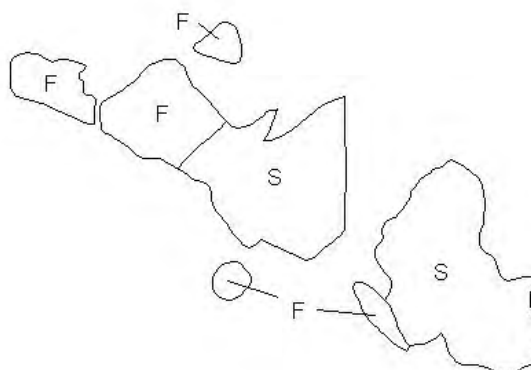
- (a) Dominant nikau with frequent kahikatea, puriri, pukatea, taraire and occasional titoki, karaka, kohekohe, manuka and totara.
- (b) Kahikatea, manuka, kowhai and puriri are common. Titoki and ti kouka are frequent with occasional rewarewa, pukatea, karaka, kauri, taraire, nikau and totara.
- (c) Approximately half of the western remnant is taraire-dominant with common tanekaha. Kauri, puriri, towai and rewarewa are frequent while rimu, miro, pukatea, totara and karaka are occasional.



Wheeki Stream/Pukemaire Remnants 006/009

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



(d) Manuka is dominant while kauri (ridges) and mamangi are common. Tanekaha, towai and taraire are frequent species with occasional puriri, rewarewa, kahikatea and titoki.

(e) Puriri and taraire are co-dominant while northern rata (emergent), kahikatea, manuka are frequent and totara is occasional.

(f) Kahikatea and tanekaha are common. Ti kouka is frequent with occasional mamangi and kanuka.

(g) In a small area mamaku, nikau, and ti kouka occur as common species. Rimu, kahikatea and totara are frequent with occasional kowhai.

(h) Most of the eastern remnant at Wheoki Stream is manuka dominant shrubland with frequent kahikatea and towai and occasional puriri, ti kouka and tanekaha.

Fauna

NI brown kiwi (Serious Decline) has been reported at least within the main body of the habitat.

Significance

A representative site for all ecological units. The site is physically linked to the estuarine habitat of the Hokianga Harbour and provides very diverse coastal forest associations, including riparian protection and transitional ecotones between the saltmarsh/mangrove of the harbour and the older growth forest. Some healthy emergent northern rata remain in the more intact gullies.

TE HURUNGA FOREST

Survey no.	O06/010
Survey date	28 June 1994
Grid reference	O06 436 375, O06 428 385
Area	470 ha (391 ha forest, 64 ha shrubland, 15 ha wetland)
Altitude	0-180 m asl

Ecological unit

(a) Puriri-taraire forest on hillslope (20%)

(b) Manuka-kauri forest on hillslope (50%)

(c) Manuka shrubland on hillslope (20%)

(d) Raupo reedland in swamp (5%)

Landform/geology

This large site exhibits a range of vegetation types on an equally diverse range of geological types. The oldest forest, occurring on Otatau Group sandstone and mudstone, is found on dissected hill country at the northern end of this forest complex. It is separated from the remainder by 200-300 m of broken treeland and pasture.

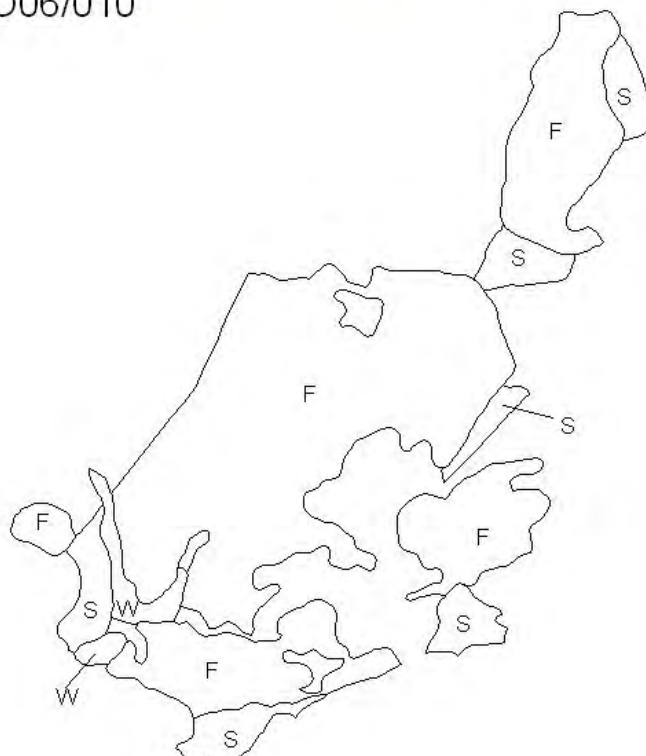
The bulk of the site is secondary forest and advanced shrubland underlain by more Otatau Group sedimentaries with Mangakahia Complex siliceous mudstone dune sands along the southern margin and some Holocene alluvium in the valley of the Waihopai Stream (overlain by raupo reedland).



Te Hurunga Forest O06/010

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



Vegetation

The area adjoins plantation forestry to the south and west, and pasture to the north and east.

(a) Puriri and taraire are co-dominant with frequent karaka, towai, kohekohe, kowhai and kanuka. Matai, miro, tawa, rimu, totara and emergent kauri, kahikatea and northern rata are occasional.

(b) About half of the site is common manuka and kauri. Tanekaha is frequent while towai, puriri, kahikatea and emergent kauri are occasional.

(c) Manuka shrubland.

(d) A raupo area occurs adjacent to the pine forest in the lower Waihopai River.
Significant flora

In 1949 Mason recorded *Mazus novaezeelandiae* ssp. *impolitus* f. *impolitus* (Serious Decline) from Te Waihopai Stream.

Fauna

Not surveyed.

Significance

Lowland forest with a significant emergent element. It includes a mineralised freshwater wetland and the coastal influence is reflected in the frequent occurrence of kowhai and karaka.

Representative site for type (a), (b) and (d).

The site will function as a 'refuge' for forest species during harvest of adjoining pines.

OTAWHITI BUSH

Survey no.	O06/012
Survey date	4 May 1994
Grid reference	O06 490 382, O06 496 385
Area	46 ha
Altitude	20–123 m asl

Ecological unit

(a) Kahikatea–taraire forest on coastal hillslope (15%)

(b) Manuka–kahikatea forest on coastal hillslope (85%)

Landform/geology

This moderate sized secondary forest remnant occurs on dissected hill country underlain by Mangakahia Complex sandstone.

Vegetation

(a) The eastern portion is dominated by kahikatea and taraire with frequent rimu, pukatea, and puriri. Kauri and kohekohe are occasional.

(b) Most of the area is dominated by abundant manuka with common kahikatea. Ti kouka and puriri are also present.

Fauna

Not surveyed by the Department of Conservation. NI brown kiwi (Serious Decline) has been reported from this site.



Otawhiti Bush O06/012

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

Significance

The site location suggests a strong coastal influence will be operating, which will determine the composition of understorey plants and future canopy species within the majority of the site.

Representative site for both ecological units and only record of type (b) in the Ecological District.

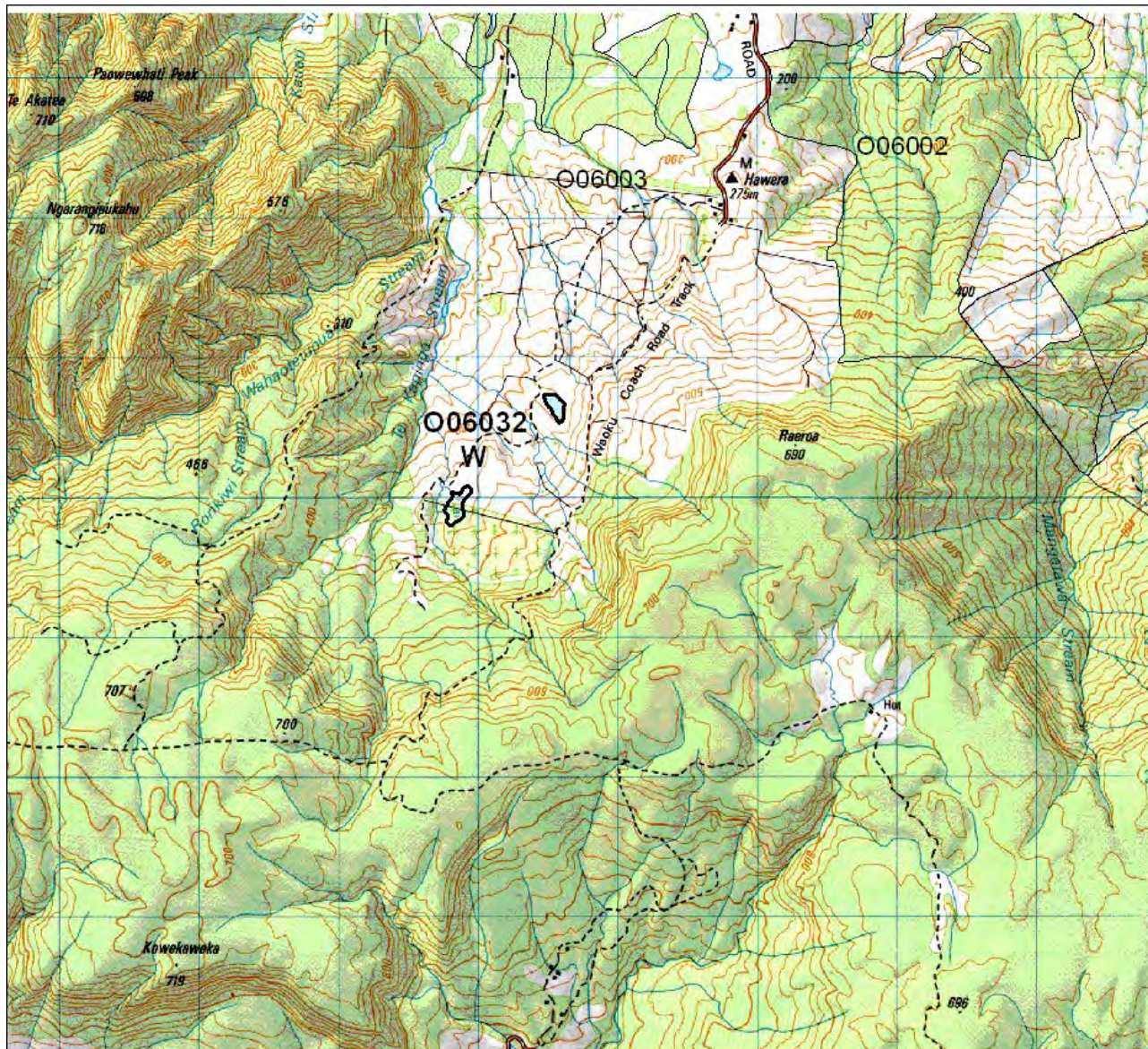
Presence of a threatened species.

WAOKU COACH RD WETLANDS

Survey no. O06/032
Survey date 6 July 1995
Grid reference O06 655 306, O06 648 299
Area 4 ha
Altitude 330-350 m asl

Ecological unit

(a) Raupo reedland in pond



Waoku Coach Rd Wetlands O06/032

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

- (b) Swamp maire swamp forest on island
- (c) Kahikatea-ti kouka forest on pond margin

Landform/geology

Dissected Mangakahia Complex sandstone.

Vegetation

Two artificial ponds c. 350 m asl adjoining exotic plantation forest to the south and rough pasture on their remaining margins.

- (a) The northernmost pond is completely (100%) vegetated by raupo.
- (b) The other pond borders pines and features a small island dominated by swamp maire and occasional towai.
- (c) Kahikatea and ti kouka form the periphery of the pond with *Carex* sp. and raupo.

Fauna

NI fernbird (Sparse).

Significance

Diversity restricted by small size and lack of open water. Presence of the Sparse NI fernbird and potential habitat for spotless crane (Sparse). Contains uncommon ecosystem-vegetation types within this Ecological District, freshwater wetland and swamp forest.

Representative site for type (b), swamp maire forest, which has also been unrecorded elsewhere in this Ecological District.

WHAWHARU SWAMP

Survey no.	O06/033
Survey date	6 July 1995
Grid reference	O06 688 372
Area	11 ha
Altitude	< 20 m asl

Ecological unit

- (a) Kahikatea-taraire forest on swamp margin (20%)
- (b) Kahikatea-ti kouka swamp forest in swamp (50%)
- (c) Raupo reedland in swamp (20%)
- (d) Willow treeland in swamp (10%)

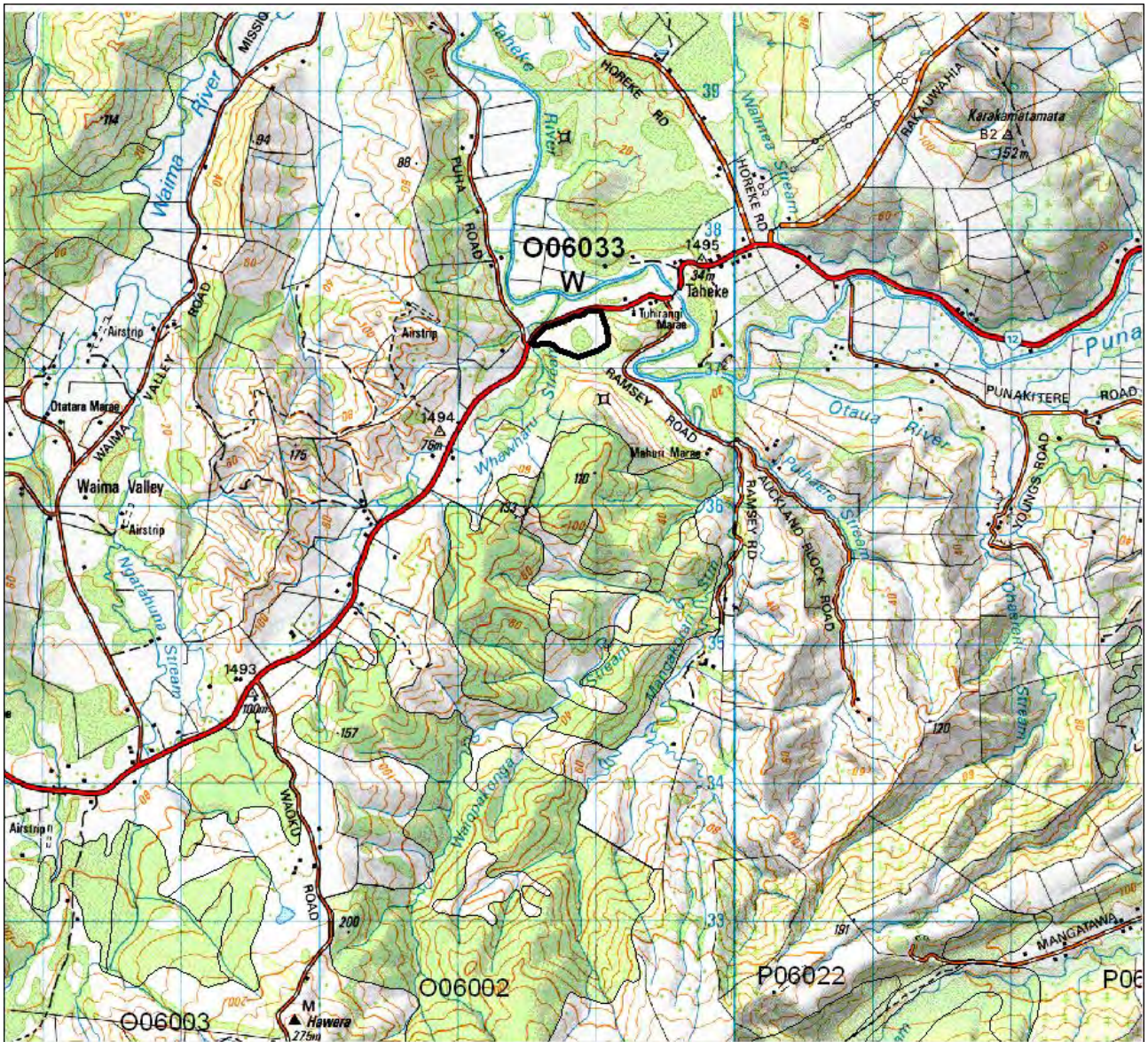
Landform/geology

This site is a freshwater wetland on alluvium formed by the impoundment of a small tributary of the Whawharu Stream.

Vegetation

A mineralised swamp which grades from peripheral podocarp broadleaf secondary forest into kahikatea and ti kouka swamp forest and finally into raupo dominant reedland. Willows may need to be controlled or eradicated to improve the natural integrity of the area.

- (a) Kahikatea and taraire occur on the periphery of the swamp with frequent towai.



Whawharu Swamp O06/033

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

- (b) Kahikatea and ti kouka occur in about half of the site with frequent raupo and *Carex* sp.
- (c) Raupo-dominant with frequent ti kouka and occasional *Carex* sp.
- (d) On the north eastern edge an area of abundant willow occurs.

Fauna

Australasian bittern (Nationally Endangered), welcome swallow, pukeko and NZ kingfisher.

Significance

High-quality wetland with a high water table. Representative of uncommon ecosystems within this Ecological District and Region, type (a), (b) and (c).

It is one of only three examples of kahikatea-ti kouka associations in the Ecological District.

Habitat for a threatened species and potential habitat for banded rail and spotless crane (both Sparse).

HOKIANGA NORTH HEAD COASTAL ASSOCIATIONS

Survey no.	O06/034
Survey date	April 1995
Grid reference	O06 405 355, O06 456 350
Area	1155 ha (786 ha duneland, 37 ha forest, 332 ha shrubland)
Altitude	0-202 m asl

Ecological unit

- (a) Sandfield (70%)
- (b) Pohutukawa forest on dune sands (<2%)
- (c) Kanuka/manuka-towai forest on dune sands (5%)
- (d) Karaka-kohekohe-kowhai-puriri forest on dune sands (<2%)
- (e) Lupin-*Spinifex* association on foredunes (10%)
- (f) Exotic pasture grass-native grass-rush association on dune sands (10-20%)
- (g) *Spinifex* association on sandspit

Landform/geology

Composed of Pleistocene eroded consolidated dunes overlain by mobile sand and features an eroded muddy limestone peak (Rangitira) on the eastern margin and an eroded canyon in the south branch of Waipapa Stream.

Vegetation

The Hokianga North Head is a site of considerable size and geomorphic distinction which supports several small remnants of coastal broadleaf forest and wetland.

- (a) Sandfield comprises most of the site.
- (b) Pohutukawa-abundant forest occurs in a very small area.
- (c) Kanuka/manuka and towai forest occurs with frequent pohutukawa and occasional kauri and tanekaha.
- (d) Karaka, kohekohe, kowhai and puriri are common associates in a small area.
- (e) Lupin and *Spinifex* are common with frequent shore bindweed and occasional pingao and pohuehue.
- (f) An association of exotic pasture grass, native grass and rush species is one of the most extensive vegetation types. While it is heavily infested with exotic species and, at times heavily grazed, it also exhibits a considerable native coastal plant component, which is inseparable from the exotics. For that reason it has been included.



Hokianga North Head Coastal Associations O06/034

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

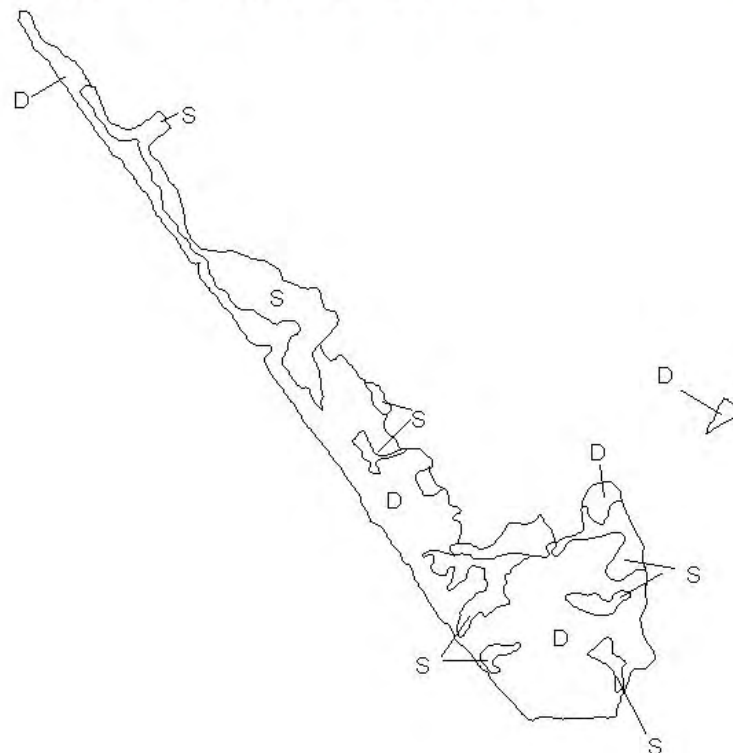
S = shrubland

F = forest

W = wetland

E = estuarine

D = duneland



(g) At Kawehitiki Point the only sandspit adjacent to the Hokianga Harbour occurs. *Spinifex* with lupin and pohuehue occur with small amounts of pingao. Further inland, shore bindweed, lupin, pohuehue, harakeke, and apple of Sodom occur.

Significant flora

Year 2000 record of *Mazus novaezeelandiae* subsp. *impolitus* f. *impolitus* (Serious Decline). *Eleocharis neozelandica*, *Pimelea arenaria* and pingao (all Gradual Decline).

Fauna

Australasian bittern (Nationally Endangered), Caspian tern (Nationally Vulnerable), banded dotterel and white-fronted tern (both Gradual Decline) and breeding Northern NZ dotterel (Sparse).

Significance

A unique landform within this Ecological District.

The extensive area of active sand dunes within this site, some reaching 200 m are classified as a geological site and landform of national significance with scientific, educational and scenic value (Kenny & Hayward 1996).

This site contains the only examples of extensive dunes in the Hokianga Ecological District and is representative for vegetation types (a), (b), (c), (d), (f) and (g). Type (a), (b), (d) and (g) are unrecorded elsewhere in the Ecological District.

This site represents one of the few remaining areas of mobile transverse dunes on the west coast of Northland.

Pohutukawa and broadleaf forest types on dune sands are also nationally rare vegetation types.

Stewardship Land of 415 ha and Marginal Strip of 69 ha, administered by the Department of Conservation, protects 41 % of this site.

RANGI POINT REMNANTS

Survey no.	O06/035
Survey date	April 1995
Grid reference	O06 445 380
Area	99 ha (8 ha estuary, 62 ha forest, 3 ha shrubland, 26 ha wetland)
Altitude	0–c.100 m asl

Ecological unit

- (a) Kanuka/manuka forest on coastal hillslope
- (b) Kanuka/manuka-towai forest on coastal hillslope
- (c) Raupo reedland in swamp
- (d) Mangrove forest in estuary

Landform/geology

The area is underlain by Mangakahia Complex siliceous mudstone in the north and Motatau Complex muddy limestone in the south.

Vegetation

Coastal shrubland grading into mineralised freshwater wetland and estuary.

- (a) Kanuka/manuka forest with frequent towai and ti kouka.
- (b) Kanuka/manuka and towai are common with the occasional kahikatea, tanekaha and kowhai.
- (c) Dominant raupo reedland.
- (d) Dominant mangrove forest.

Fauna

Northland green gecko (Gradual Decline).

Significance

Significant for its diversity of habitat types, this area exhibits gradients from coastal shrubland and young forest, through raupo dominant freshwater wetlands, into an estuarine saltmarsh/mangrove association of the Hokianga Harbour. Stock damage to the latter is evident and may extend into the other habitat types as well.

This site is physically linked by plantation forest to the large Te Hurunga Forest to the west and, to the east, grades into coastal riparian forest in areas.

Representative site for type (b), (c) and (d).

It is one of only a few sites in the North Hokianga where the threatened Northland green gecko has been recorded and it is likely to support several wetland bird species of Sparse ranking.

The Department of Conservation administers 1 ha of Stewardship Land within this site.

ARAIWHENUA STREAM SWAMP FOREST REMNANTS

Survey no.	P06/016
Survey date	1 May 1994
Grid reference	P06 778 296, P06 781 301
Area	9 ha
Altitude	90 m asl

Ecological unit

- (a) Kahikatea-pukatea forest on alluvium (60%)
- (b) Kahikatea forest on alluvium (40%)

Landform/geology

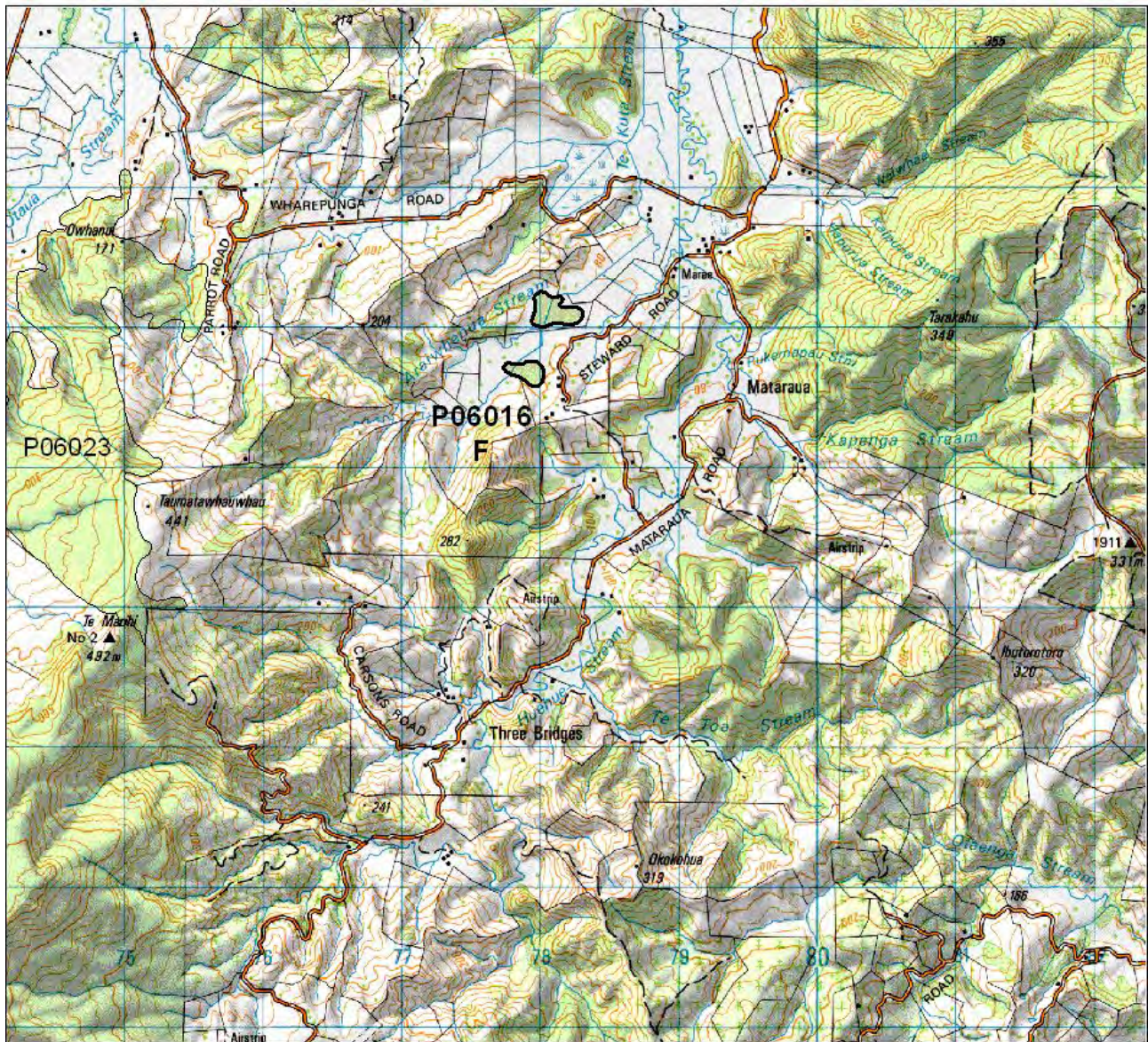
Alluvium in valley.

Vegetation

Two small unfenced forest remnants in the Araiwhenua Stream valley. The understorey is sparse.

(a) Kahikatea and pukatea are common species in the larger remnant. *Astelia* sp. is frequent with occasional titoki and ti kouka in a somewhat fragmented canopy.

(b) In the smaller block kahikatea is dominant with frequent pukatea and occasional taraire.



Araiwhenua Stream Swamp Forest Remnants P06/016

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

Fauna

Not surveyed.

Significance

Representative of a rare and diminishing forest type, alluvial kahikatea and kahikatea-pukatea forest. The latter is unrecorded elsewhere in the Ecological District.

NINIHI RD SWAMP & CATCHMENT

Survey no.	P06/020
Grid reference	P06 762 323
Survey date	1 May 1994
Area	120 ha (112 ha forest, 8 ha wetland)
Altitude	60-214 m asl

Ecological unit

- (a) Kahikatea-totara-towai secondary forest on hillslope
- (b) Manuka forest on hillslope
- (c) Raupo reedland in swampy valley

Landform/geology

Underlain by Otatau Group sandstone and conglomerate.

Vegetation

This outlier to the Kaipeha wetland catchment is physically linked to that habitat by a narrow corridor of secondary forest and swamp.

- (a) Kahikatea, totara and towai-dominant canopy with frequent taraire and rewarewa and occasional kauri, tanekaha and ti kouka.
- (b) Manuka forest.
- (c) Raupo-dominant wetland with frequent ti kouka and occasional manuka.

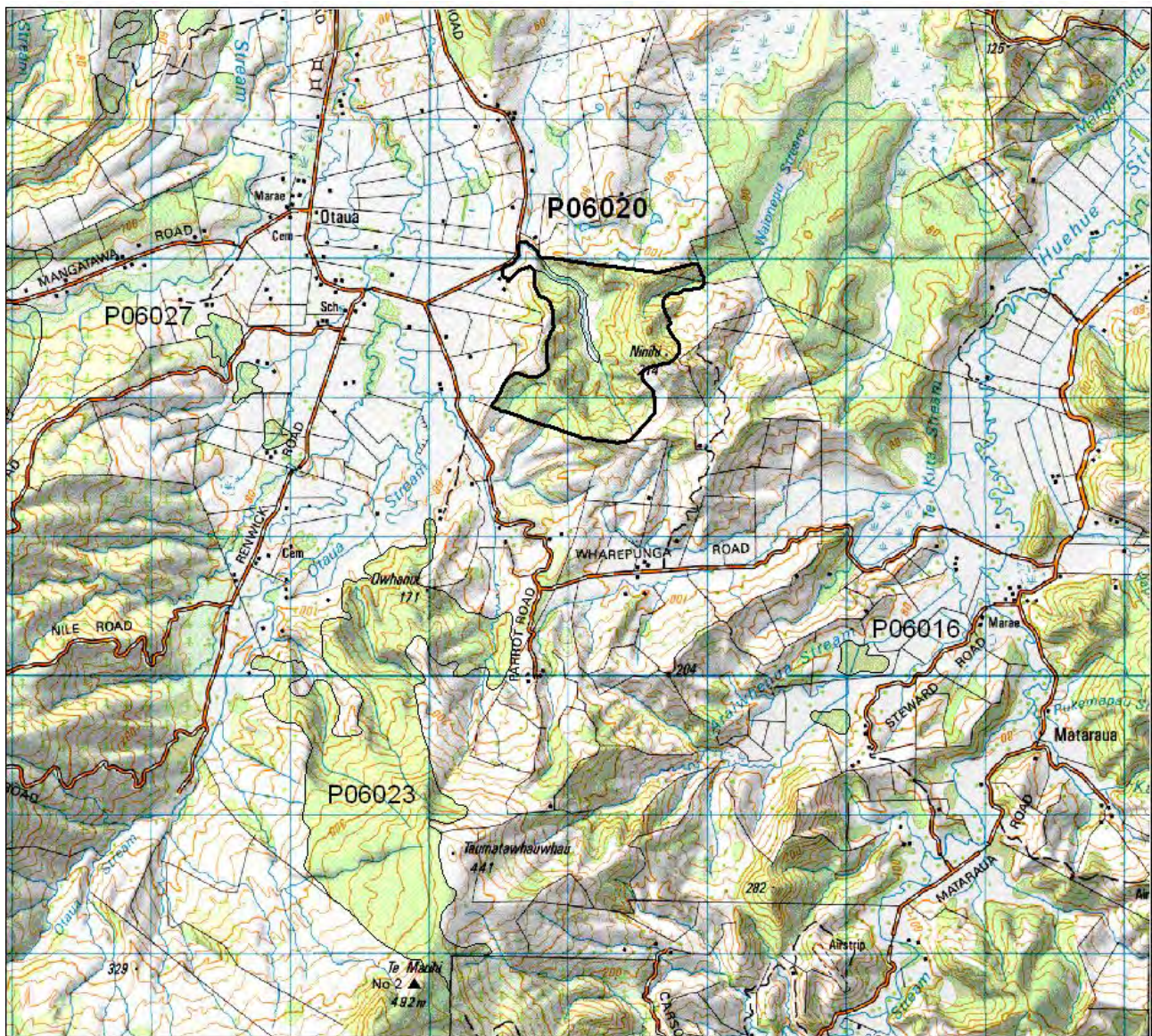
Although Kaipeha Wetland lies within the Kaikohe Ecological District, it is closely associated and an integral part of the Ninihi Rd habitat.

Fauna

NI brown kiwi (Serious Decline) has been recorded from within the greater habitat and it is very likely that NI fernbird and spotless crane (both Sparse), recorded within the adjoining wetland, are present in the raupo dominant wetland. Australasian bittern (Nationally Endangered) may also utilise the additional habitat available within this largely forested enclave as their territories are (depending on quality) generally quite large and bittern are a mobile species. Likely seasonal use by kukupa (Gradual Decline) especially during kahikatea fruiting period.

Significance

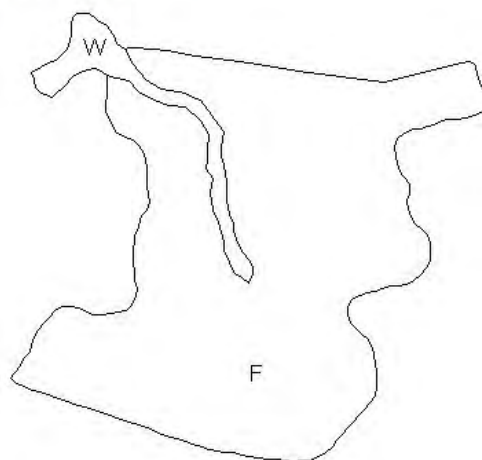
Contains representation of mineralised freshwater wetlands and performs a catchment protection function for, and is an integral part of one of the largest freshwater systems in the Ecological Region (Kaipeha Swamp in the Kaikohe Ecological District). Representative site for type (c) raupo reedland and type (a), kahikatea-totara-towai secondary forest which is unrecorded elsewhere in the Ecological District.



Ninihi Rd Swamp & Catchment P06/020

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

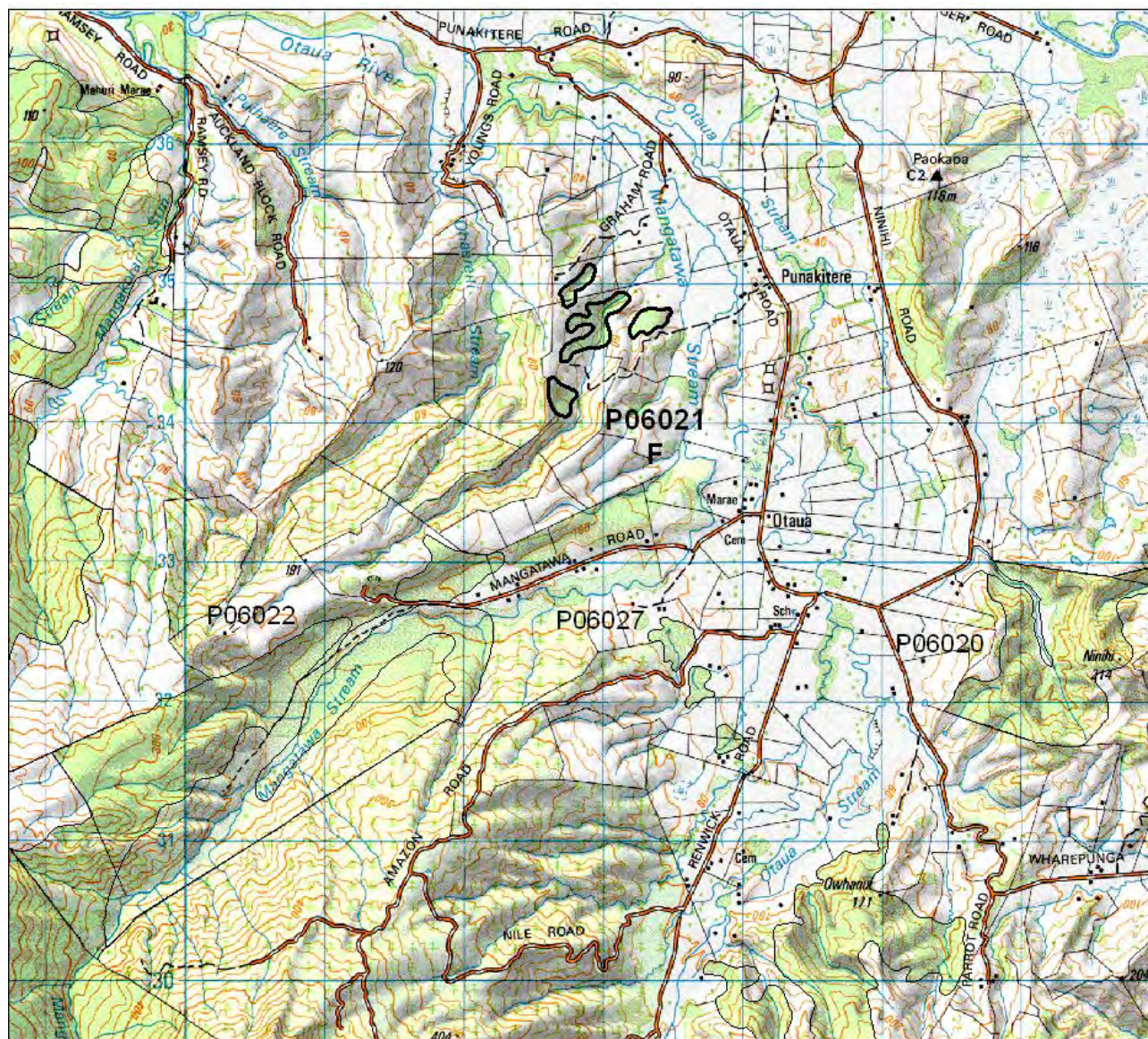


MANGATAWA STREAM FOREST REMNANTS

Survey no. P06/021
 Survey date 2 May 1995
 Grid reference P06 729 346, P06 733 347, P06 727 341, P06 728 349
 Area 20 ha
 Altitude 40-100 m asl

Ecological unit

(a) Taraire-totara forest on hillslope



Mangatawa Stream Forest Remnants P06/021

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

S = shrubland
 F = forest
 W = wetland
 E = estuarine
 D = duneland

(b) Kahikatea secondary forest on alluvial terrace

Landform/geology

Situated in an open valley with high-level terraces underlain by Mangakahia Complex sandstone.

Vegetation

These four secondary forest remnants are unfenced, but are loosely linked to the Waima Forest tract by adjacent plantation forestry.

(a) Taraire and totara forest with frequent kahikatea and occasional pukatea and rimu, some of which are emergent.

(b) Kahikatea forest with frequent totara and occasional rimu and pukatea. An understorey element persists.

Fauna

Not surveyed.

Significance

Representative site and the best remaining example in the Ecological District of type (a) taraire-totara forest, (only one of two sites recorded in the District), and type (b) kahikatea secondary forest on alluvial terrace, an uncommon forest type in this Ecological District and Northland.

MANGATAWA BUSH

Survey no.	P06/022
Survey date	2 March 1994
Grid reference	P06 718 329, P06 703 314
Area	433 ha (219 ha forest, 214 ha shrubland)
Altitude	c. 100–400 m asl

Ecological unit

(a) Taraire-towai forest on hillslope

(b) Totara secondary forest on hillslope

(c) Manuka shrubland on hillslope

Landform/geology

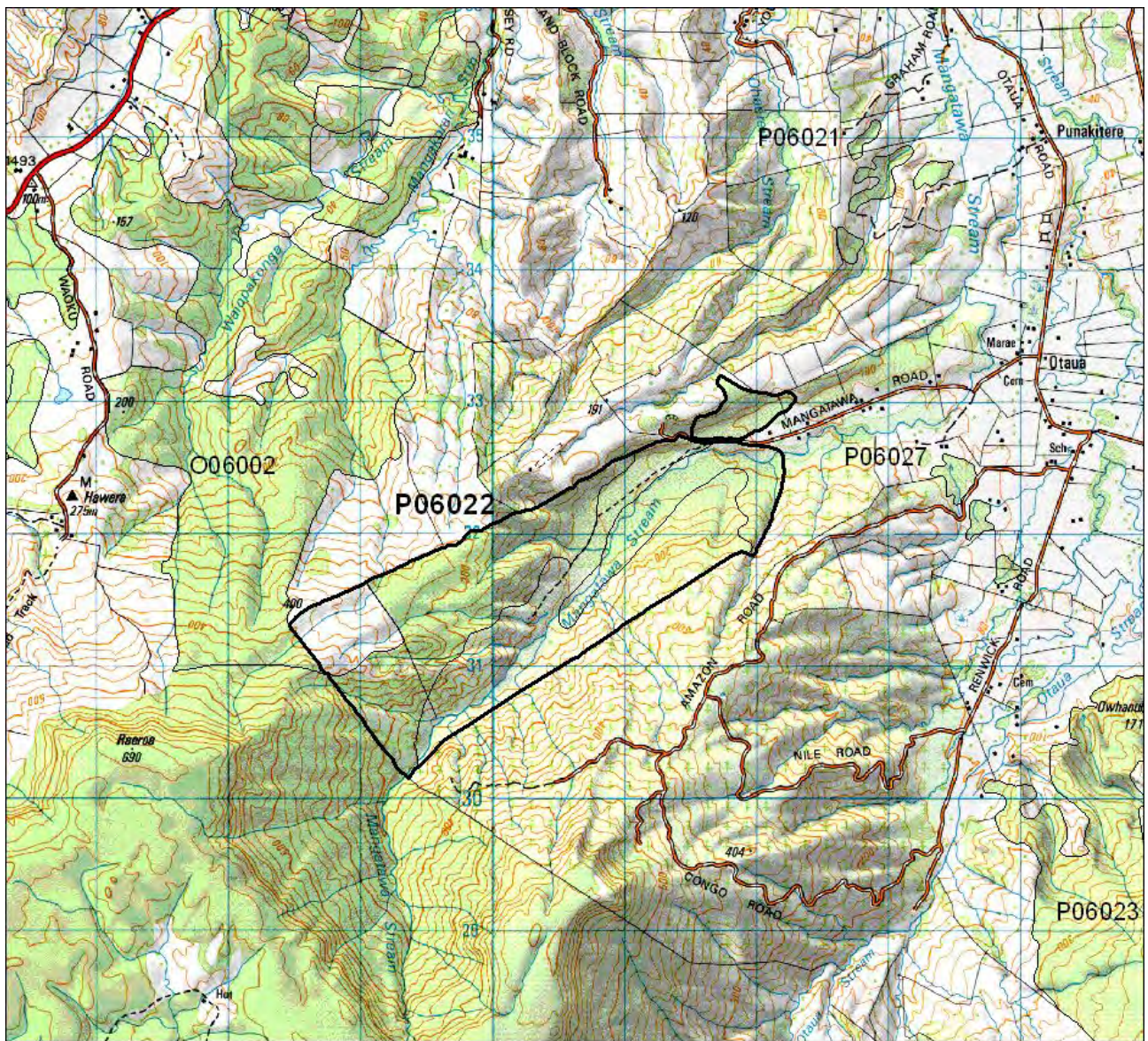
This large outlier of Mataraua Forest is situated in steep hill country underlain by Mangakahia Complex sandstone with basalt alluvium in the Mangatawa Stream valley.

Vegetation

(a) The age and quality of the forest increases towards the interior with emergent northern rata and podocarps becoming more frequent away from the effects of historic modification.

Co-dominant taraire and towai occur with frequent kahikatea, totara, nikau, rewarewa with occasional pukatea, puriri, emergent northern rata and rimu. Kauri is occasional.

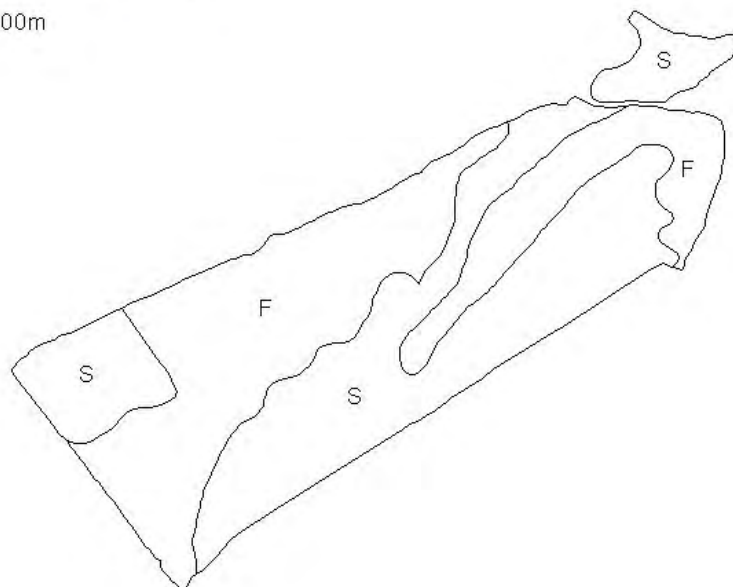
(b) Secondary totara forest with locally frequent kahikatea, and occasional rewarewa and rimu.



Mangatawa Bush P06/022

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



(c) Manuka shrubland with mamaku, totara and towai. Totara is locally common.

Fauna

NI brown kiwi (Serious Decline) and kauri snail (Gradual Decline). Kukupa (Gradual Decline) are likely to occur as they are present in the rest of the contiguous forest area.

Significance

As a connected outlier of the Waipoua-Waima-Mataraua Forest continuum, this site can be expected to share many of the values of the greater habitat.

Representative site for all ecological units.

The site provides an upper catchment and riparian protection function and adds to the altitudinal range of eastern Mataraua.

Presence of threatened species.

TAUMATAWHAUWHAU FOREST OUTLIER

Survey no.	P06/023
Survey date	2 May 1994
Grid reference	P06 746 294
Area	262 ha
Altitude	80–420 m asl

Ecological unit

- (a) Kauri-rewarewa-taraire forest on hillslope
- (b) Taraire forest on hillslope
- (c) Manuka shrubland on hillslope

Landform/geology

Unlike the majority of the Mataraua Forest, this northern outlier contains areas of Otaua Group sandstone and conglomerate as well as the more common Waipoua basalt and basalt talus downslope.

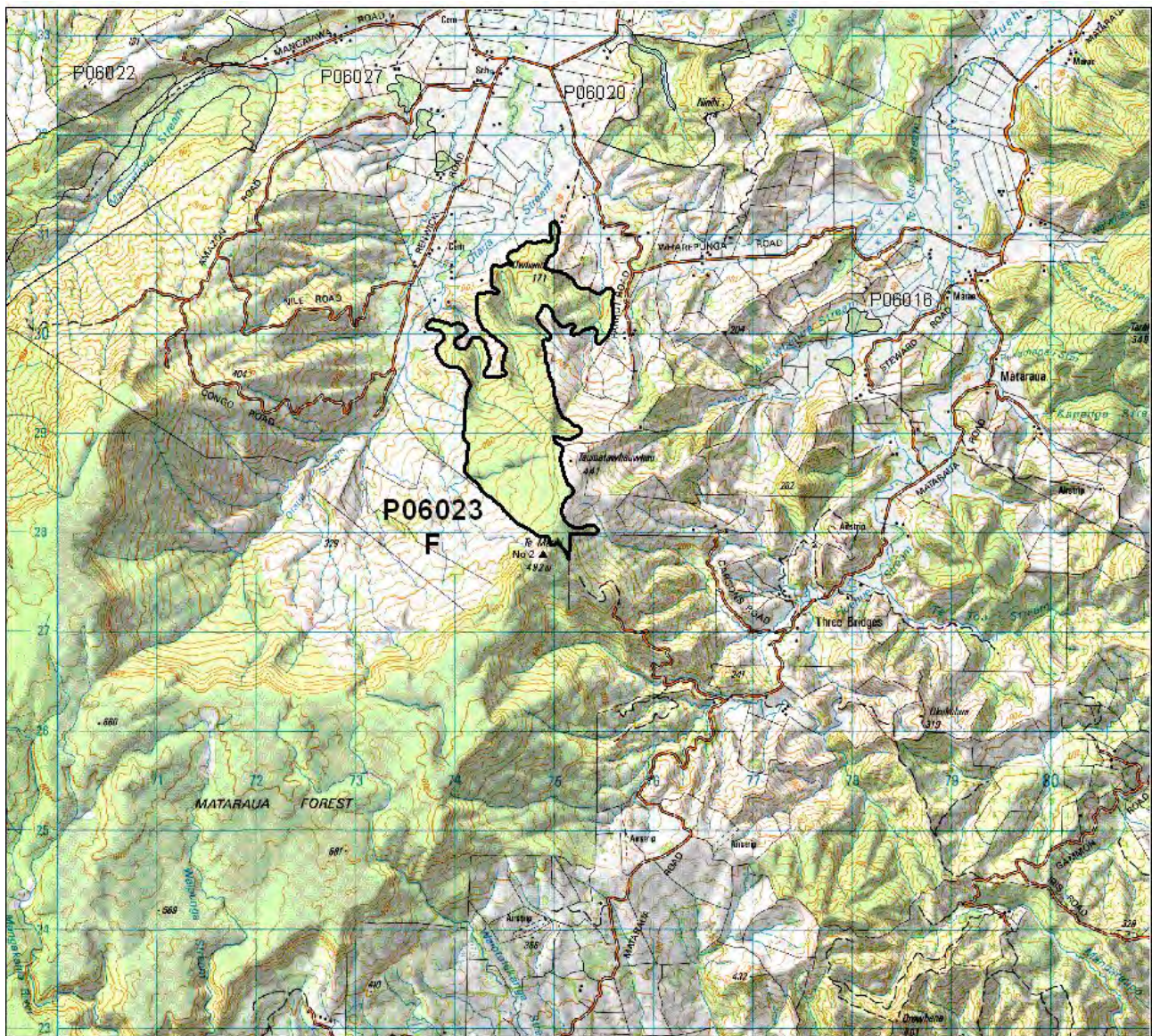
Vegetation

This large outlier to Mataraua Forest contains unmodified taraire/kauri forest with some emergent kahikatea, rimu and northern rata. The manuka dominant shrubland is mainly restricted to the periphery and serves as an effective buffer to the old-growth forest.

- (a) Kauri (emergent), rewarewa and taraire association with frequent kahikatea (some emergent) and occasional rimu, kohekohe, puriri and tanekaha.
- (b) Taraire forest with frequent nikau, mamaku, rewarewa, kahikatea and emergent rimu with occasional miro, tawa, puriri, kohekohe and emergent northern rata.
- (c) Periphery of manuka shrubland with occasional totara, tanekaha and kahikatea fulfils an important role in linking the forest types and augmenting the podocarp element.

Fauna

NI brown kiwi (Serious Decline) has been reported in this habitat.



Taumatawhauwhau Forest Outlier P06/023

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

Significance

It is physically linked to the largest contiguous forest tract in Northland, the Waipoua-Waima-Mataraua Forest tract which supports many threatened and regionally significant plants and animals.

Representative site for all ecological units with type (a) the only example recorded in the Ecological District.

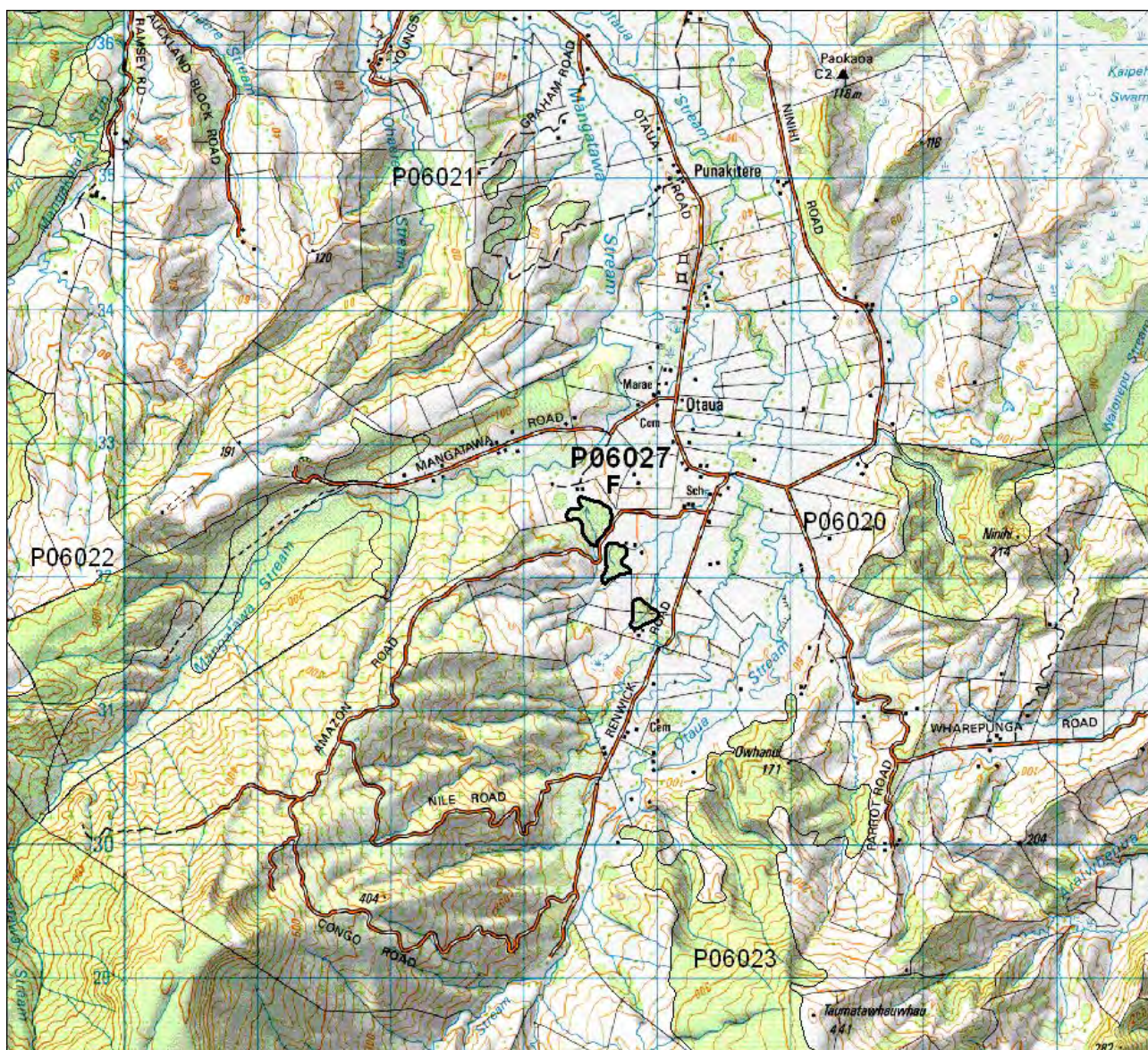
A small area of this site, 5 ha, is a Conservation Covenant administered by the Department of Conservation.

AMAZON RD FOREST

Survey no. P06/027
 Survey date 2 May 1994
 Grid reference P06 734 324, P06 736 320, P06 739 317
 Area 14 ha
 Altitude 60-80 m asl

Ecological unit

(a) Kahikatea forest on alluvial terrace



Amazon Rd Forest P06/027

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

S = shrubland
 F = forest
 W = wetland
 E = estuarine
 D = duneland

Landform/geology

Situated on elevated alluvial terraces.

Vegetation

Three kahikatea dominant forest remnants. At least one of the remnants is partly fenced, containing some understorey species and adjoins a plantation forest which provides a tenuous link between these lowland remnants and the higher altitude forest of the Mataraua Plateau. Associated canopy species include frequent rimu and totara with occasional taraire, rewarewa, miro, tanekaha and pukatea.

Fauna

Not surveyed.

Significance

A representative site for kahikatea forest which was once common in parts of this Ecological District, but which is now very uncommon mainly due to past land clearance for pastoral farming.

4.2 LEVEL 2 SITES

SITE NAME	SURVEY NO.	GRID REF.
Herekino River South Remnants	N05/004	N05 292 595, N05 294 595, N05 291 591
Upper Mangakotukutuku Stream	O05/021	O05 370 655, O05 367 656, O05 365 657, O05 364 660, O05 372 654
Waiotehue Stream Bush	O05/026	O05 381 623
Yuretich Rd Shrubland	O05/027	O05 354 626, O05 356 619, O05 351 622, O05 358 624
“137” Awaroa River Shrubland	O05/028	O05 361 605
Uwhiroa Stream Remnants	O05/029	O05 344 623, O05 339 625, O05 335 617
McDonald Rd Bush	O05/031	O05 339 607
Smith Rd Forest Remnants	O05/034	O05 333 583, O05 322 585, O05 314 582, O05 334 589, O05 317 587
Stephens Bush	O05/038	O05 302 548
Poutawhera Pa Shrubland	O05/039	O05 330 524
Pawarenga Rd Shrubland	O05/042	O05 396 530
Tamaho Rd Bush	O05/043	O05 347 534, O05 337 529, O05 336 528, O05 343 532
“165” Kohe Bush	O05/044	O05 356 534
Candy Bush	O05/047	O05 364 543, O05 351 540, O05 362 547
Maire Stream Pond	O05/050	O05 349 583
Grounds - Haumanga Rd Bush	O05/051	O05 382 556
Awaroa Rd Bush	O05/057	O05 386 588, O05 385 588
Mansbridge Scenic Reserve	O05/063	O05 494 606
Paponga Pond	O05/068	O05 507 560
Beer Bush	O05/070	O05 488 539
Runaruna Scenic Reserve	O05/073	O05 450 558, O05 444 555, O05 443 562, O05 450 563
Runaruna Rd Shrubland	O05/074A	O05 422 540
Irvine Rd Bush	O05/074B	O05 424 534, O05 427 527, O05 426 530, O05 435 541, O05 431 531
Panguru Bush Remnant	O05/093	O05 462 477
Puketawa Rd Bush	O05/095	O05 465 484, O05 464 492
Mihirau Bush	O05/100	O05 471 502
Te Konoke Bush	O05/121	O05 590 505
Mudgeway Rd Bush	O05/126	O05 642 571
Upper Mangawero Stream Tributary Remnant	O05/147	O05 485 561
Whakaoma/Huraunui Stream Secondary Forest Remnant	O05/150	O05 630 550
Kahikatoa Rd Pond	O05/153	O05 610 555
Koutu Shrubland	O06/011	O06 484 366

HEREKINO RIVER SOUTH REMNANTS

Survey no.	N05/004
Survey date	12 December 1994
Grid reference	N05 292 595, N05 294 595, N05 291 591
Area	16 ha (3 ha forest, 13 ha shrubland)
Altitude	< 20–40 m asl

Ecological unit

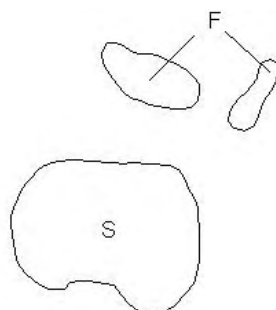
- (a) Kanuka–puriri forest on coastal hillslope
- (b) Kanuka shrubland on coastal hillslope



Herekino River South Remnants N05/004

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



Landform/geology

Coastal hills on sandstone adjoining the Herekino River.

Vegetation

Two isolated forest remnants and an area of shrubland.

(a) The two remnants consist of kanuka and puriri with occasional totara, kahikatea and ti kouka.

(b) The shrubland is kanuka to 4 m with occasional ti kouka, totara, rewarewa and mamaku.

Along the mangrove edge is a fringe of manuka.

Fauna

Not surveyed by the Department of Conservation. NI brown kiwi (Serious Decline) has been reported from this site.

Significance

Shrubland adjoining and buffering the Herekino Harbour and remnants providing habitat for kiwi and potential habitat for kukupa. Although it is the only site in the Ecological District where type (a) kanuka-puriri forest is recorded and NI brown kiwi have been reported, the small, fragmented nature of the site limits its significance.

UPPER MANGAKOTUKUTUKU STREAM

Survey no.	O05/021
Survey date	21 November 1994
Grid reference	O05 370 655, O05 367 656, O05 365 657 O05 364 660, O05 372 654
Area	2 ha
Altitude	c. 60 m asl

Ecological unit

(a) Constructed pond in stream valley

(b) Raupo reedland in stream valley

(c) Manuka-bracken association on hillslope

Landform/geology

Dissected hill country on Mangakahia Complex sandstone and siliceous mudstone.

Vegetation

(a) Two artificial ponds.

(b) Raupo with rushes occurs sparsely on the margins.

(c) Intermittent patches of raupo surrounded by manuka, 2–3 m tall, bracken and open ground.

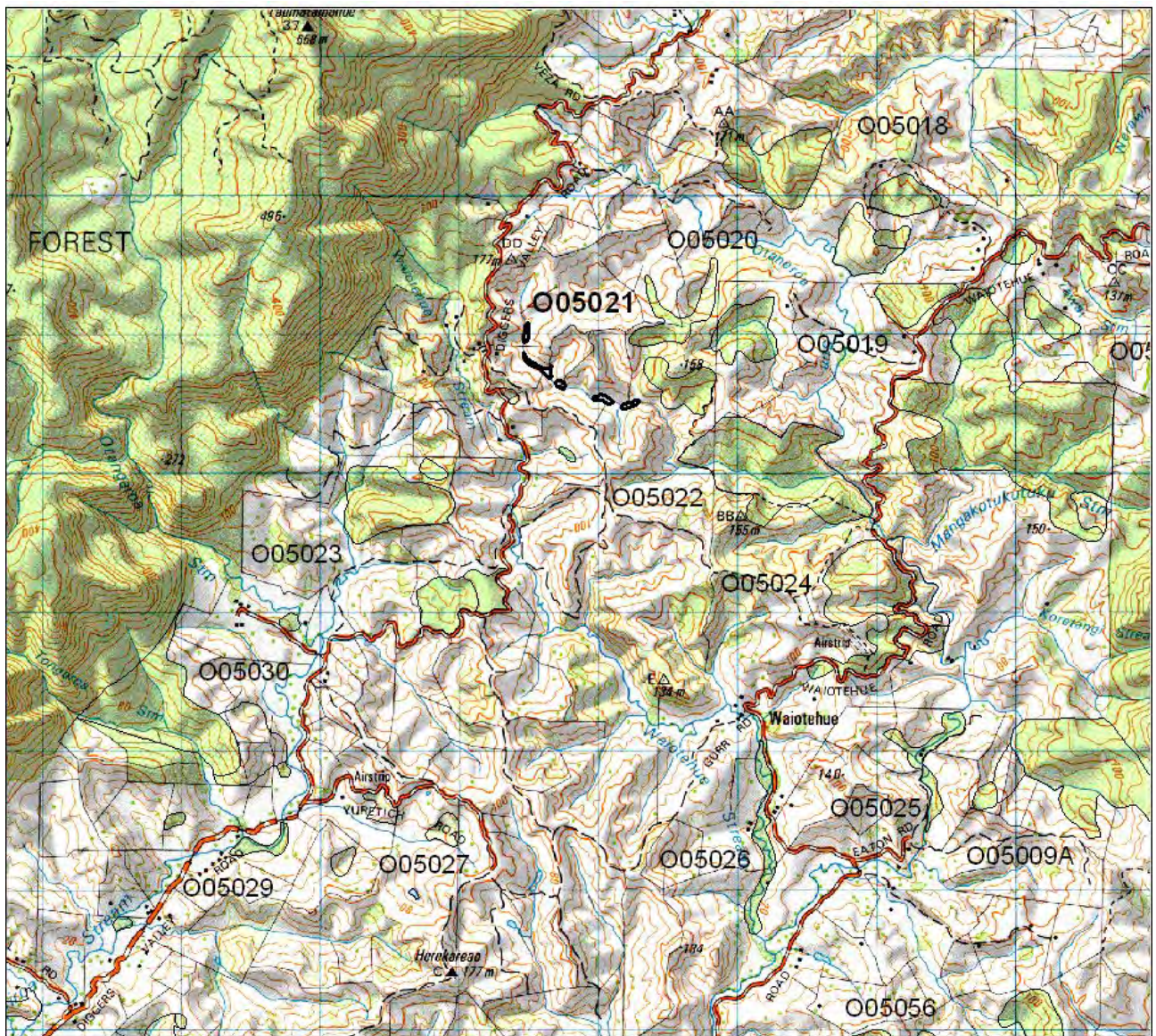
The entire area has recently been planted in pines.

Fauna

Not surveyed.

Significance

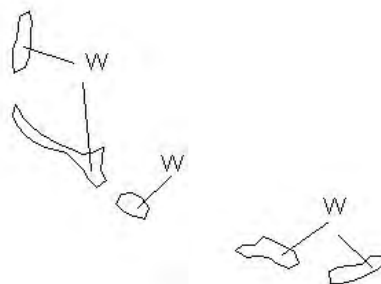
A small wetland, potentially habitat for wildlife.



Upper Mangakotukutuku Stream O05/021

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



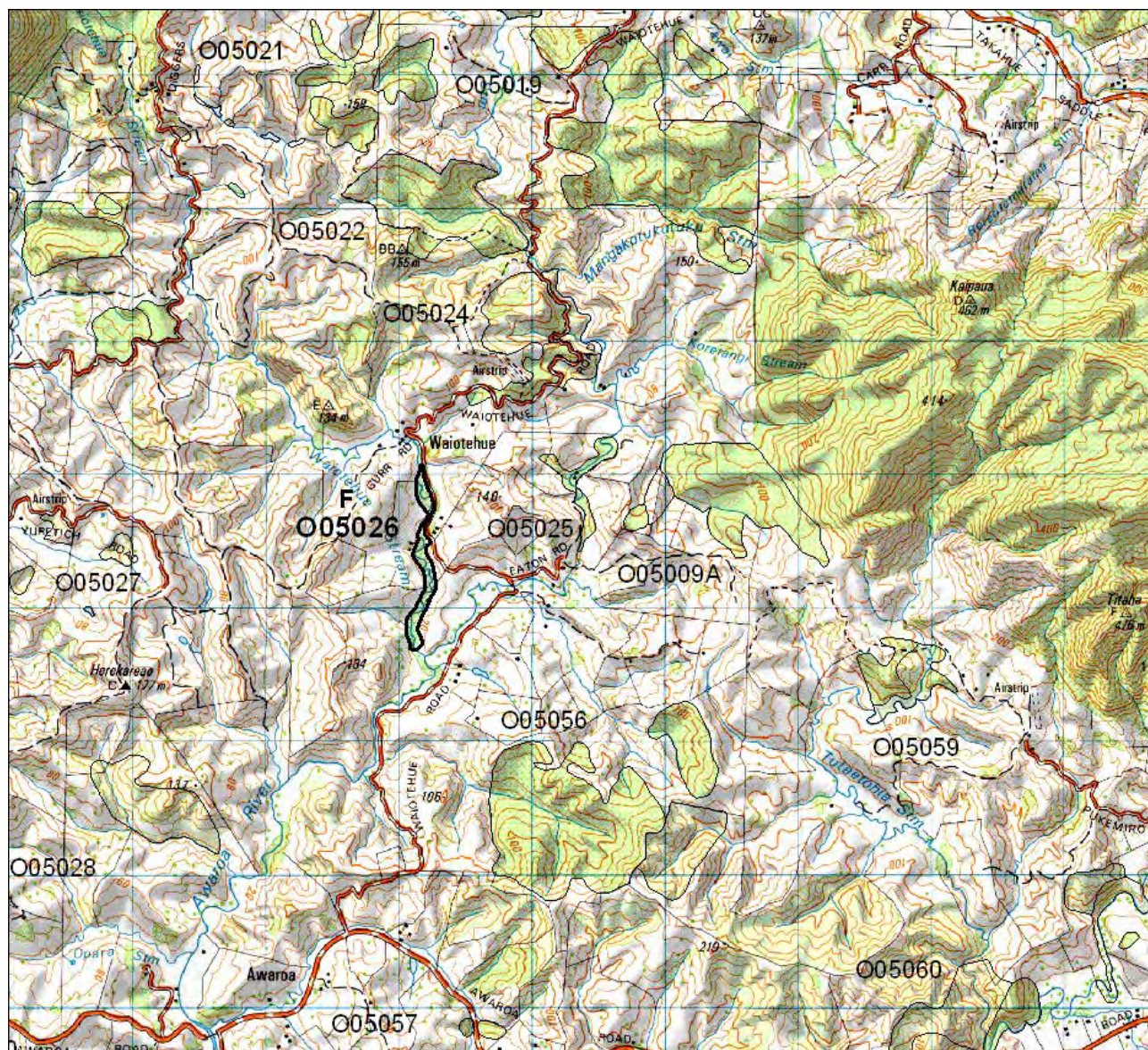
Only record of type (c) in the Ecological District; however, the quality and value of this habitat at the time of survey does not warrant Level 1 status.

WAIOTEHUE STREAM BUSH

Survey no. O05/026
Survey date 18 November 1994
Grid reference O05 381 623
Area 11 ha
Altitude < 20 m asl

Ecological unit

(a) Taraire treeland on alluvium (30%)



Waiotehue Stream Bush O05/026

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

- (b) Totara secondary treeland on alluvium (70%)

Landform/geology

Alluvial flats in the valley of the Waiotehue Stream. The valley walls are in Mangakahia Complex sandstone, with Pleistocene alluvial terrace on the eastern bank in the south.

Vegetation

(a) Taraire is common over one third of the area with frequent totara and towai. Other species occurring are rewarewa, pukatea, kahikatea, titoki, kanuka, ti kouka and nikau.

(b) Most of the site is riparian vegetation in which totara is abundant and kanuka occasional.

Fauna

Not surveyed.

Significance

Riparian vegetation on alluvium is uncommon in the Ecological District and Region but the quality of this site limits its significance.

Marginal Strip, administered by the Department of Conservation protects 4 ha of this site.

YURETICH RD SHRUBLAND

Survey no.	O05/027
Survey date	21 November 1994
Grid reference	O05 354 626, O05 356 619, O05 351 622, O05 358 624
Area	10 ha (9.7 ha shrubland, 0.3 ha wetland)
Altitude	40-100 m asl

Ecological unit

(a) Kanuka/manuka shrubland on hillslope (70%)

(b) Constructed wetland

Landform/geology

Four remnants located on dissected hill country on Mangakahia Complex sandstone.

Vegetation

(a) Remnant shrubland vegetation about 2-3 m tall in gullies and on steep slopes. Totara, kahikatea, puriri, towai, ti kouka, mahoe, and pate are occasional.

Pines have been planted in part of the valley bottom.

(b) A small constructed wetland occurs.

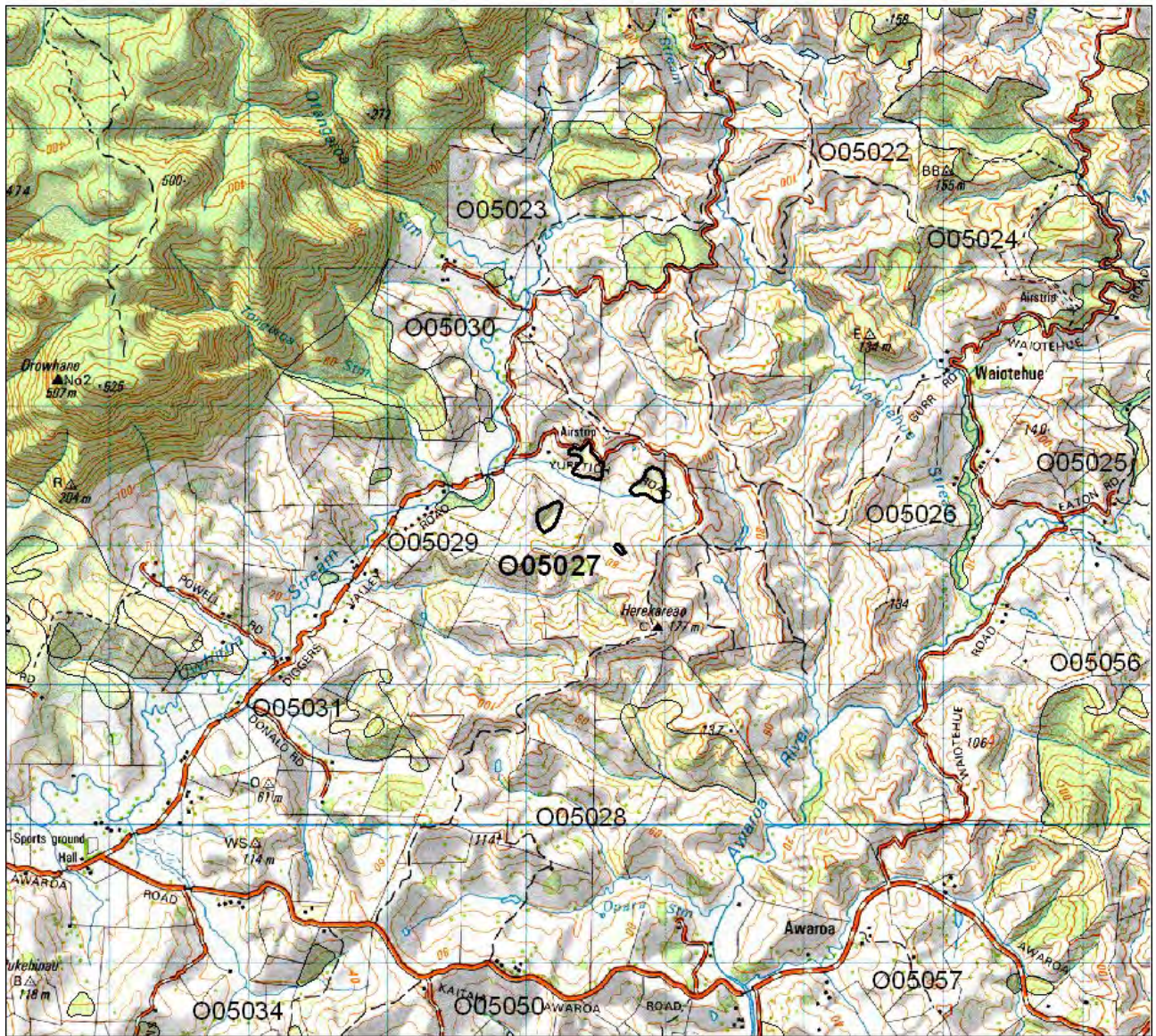
Fauna

Kukupu (Gradual Decline) reported.

Significance

Water catchment and soil retention values.

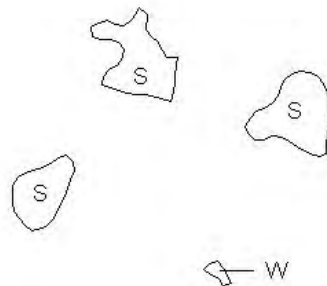
The threatened kukupu is reported from this site, but the quality of this site does not warrant Level 1 status.



Yureich Rd Shrubland O05/027

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

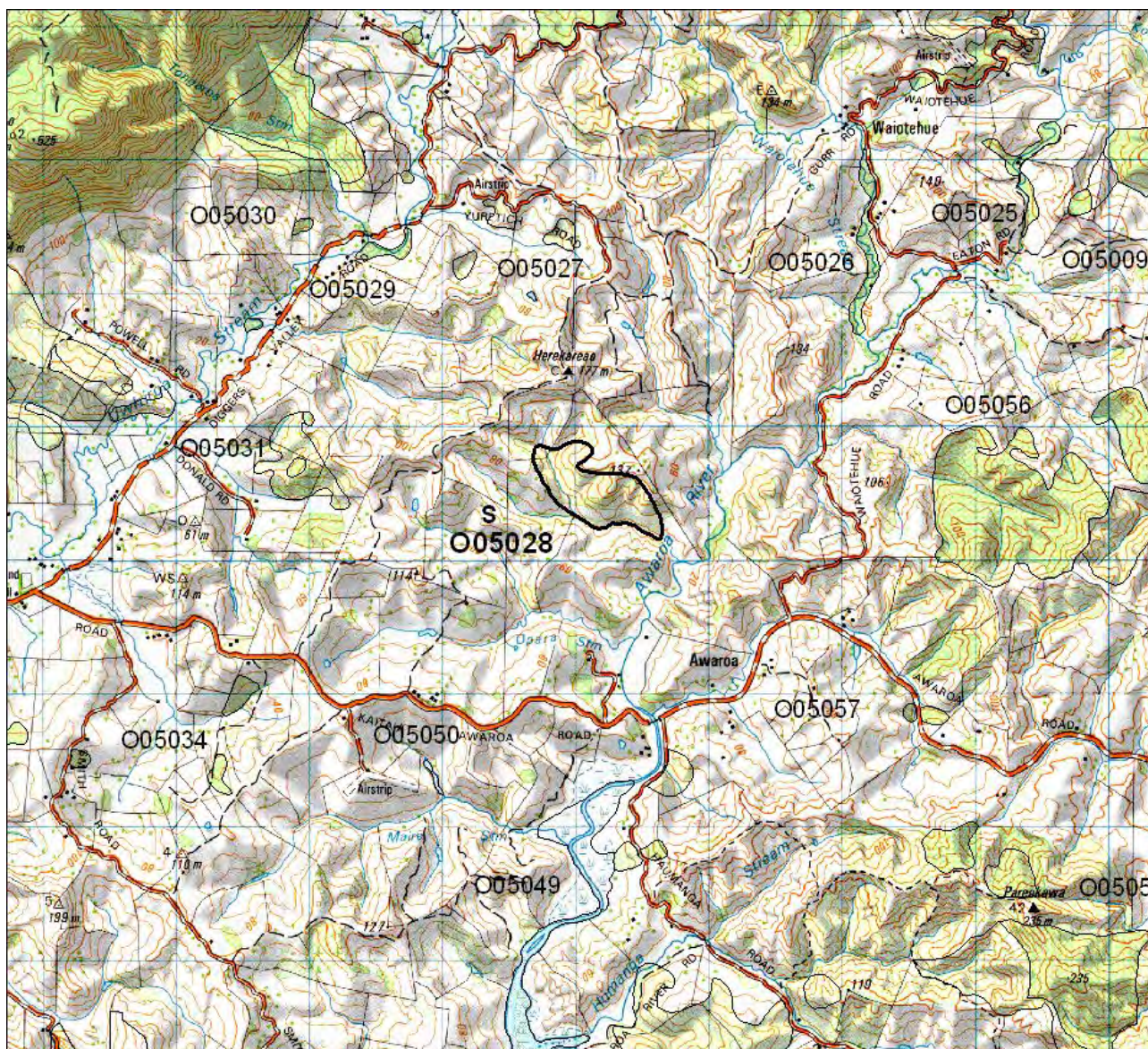


"137" AWAROA RIVER SHRUBLAND

Survey no. O05/028
 Survey date 10 January 1995
 Grid reference O05 361 605
 Area 36 ha
 Altitude <20-137 m

Ecological unit

(a) Kanuka/manuka shrubland on moderate to steep hillslope



"137" Awaroa River Shrubland O05/028

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

S = shrubland
 F = forest
 W = wetland
 E = estuarine
 D = duneland

(b) Manuka-totara shrubland on moderate to steep hillslope

Landform/geology

Dissected hill country on Mangakahia Complex sandstone.

Vegetation

(a) A reasonably large area of low kanuka/manuka shrubland, discontinuous in places with scattered puriri, totara, pine and mamaku.

(b) To the south is a smaller area of manuka and totara.

Fauna

Habitat suitable for NI brown kiwi (Serious Decline) which are present in adjacent areas.

Significance

A partial linkage between Herekino Forest and other sites in the Awaroa-Broadwood area and a potential refuge for wildlife. Survey recommended for NI brown kiwi.

UWHIROA STREAM REMNANTS

Survey no.	O05/029
Survey date	21 November 1994
Grid reference	O05 344 623, O05 339 625, O05 335 617
Area	6 ha
Altitude	< 20 m asl

Ecological unit

(a) Totara treeland on alluvium

(b) Taraire-totara forest on hillslope

Landform/geology

Two remnants located on alluvial flats in the valley. One remnant located on the surrounding hills of Mangakahia Complex sandstone.

Vegetation

(a) Along the stream totara is abundant with frequent taraire and scattered puriri, ti kouka, kahikatea, karaka and willow.

(b) Across the road is a remnant in which taraire and totara are both common. Rimu, kahikatea, nikau, puriri, rewarewa, towai and mamaku also occur.

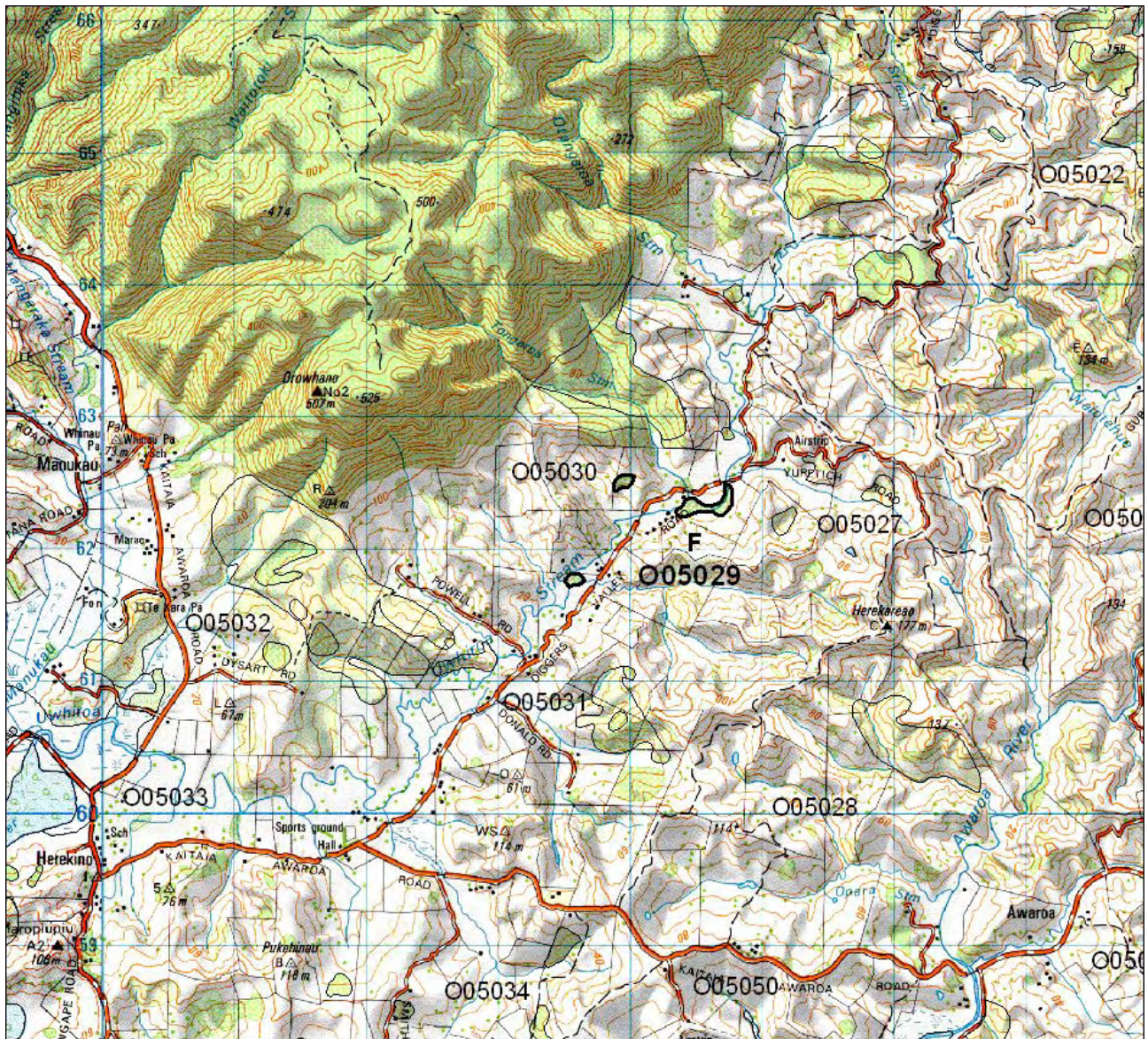
Downstream, totara is common, type (a) and taraire frequent. Kahikatea, titoki, kowhai, pine and macrocarpa are also present.

Fauna

Not surveyed.

Significance

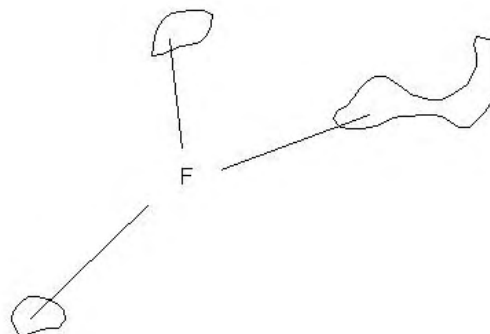
Riparian vegetation providing shading to the Uwhiroa Stream and a broadleaf-podocarp remnant which is a potential food source for the threatened kukupa. One of two sites in the Ecological District where type (b), taraire-totara forest is recorded.



Uwihroa Stream Remnants O05/029

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



MCDONALD RD BUSH

Survey no.	O05/031
Survey date	21 November 1994
Grid reference	O05 339 607
Area	24 ha (2 ha forest, 22 ha shrubland)
Altitude	20-100 m asl

Ecological unit

- (a) Manuka shrubland on hillslope (40%)
- (b) Nikau-puriri-taraire forest on hillslope (<5%)
- (c) Taraire forest on hillslope (<5%)
- (d) Kanuka/manuka shrubland on hillslope (50%)

Landform/geology

Dissected hill country on Mangakahia Complex sandstone.

Vegetation

- (a) Just under half the area is 2-4 m tall dominant manuka with occasional ti kouka and totara.
- (b) A small pocket of nikau, puriri and taraire occurs.
- (c) Dominant taraire also occurs in a small area with occasional kahikatea, rimu, totara, nikau, puriri and rewarewa.
- (d) About half the area is dominant kanuka/manuka shrubland (to 8 m tall) with the occasional kahikatea and totara.

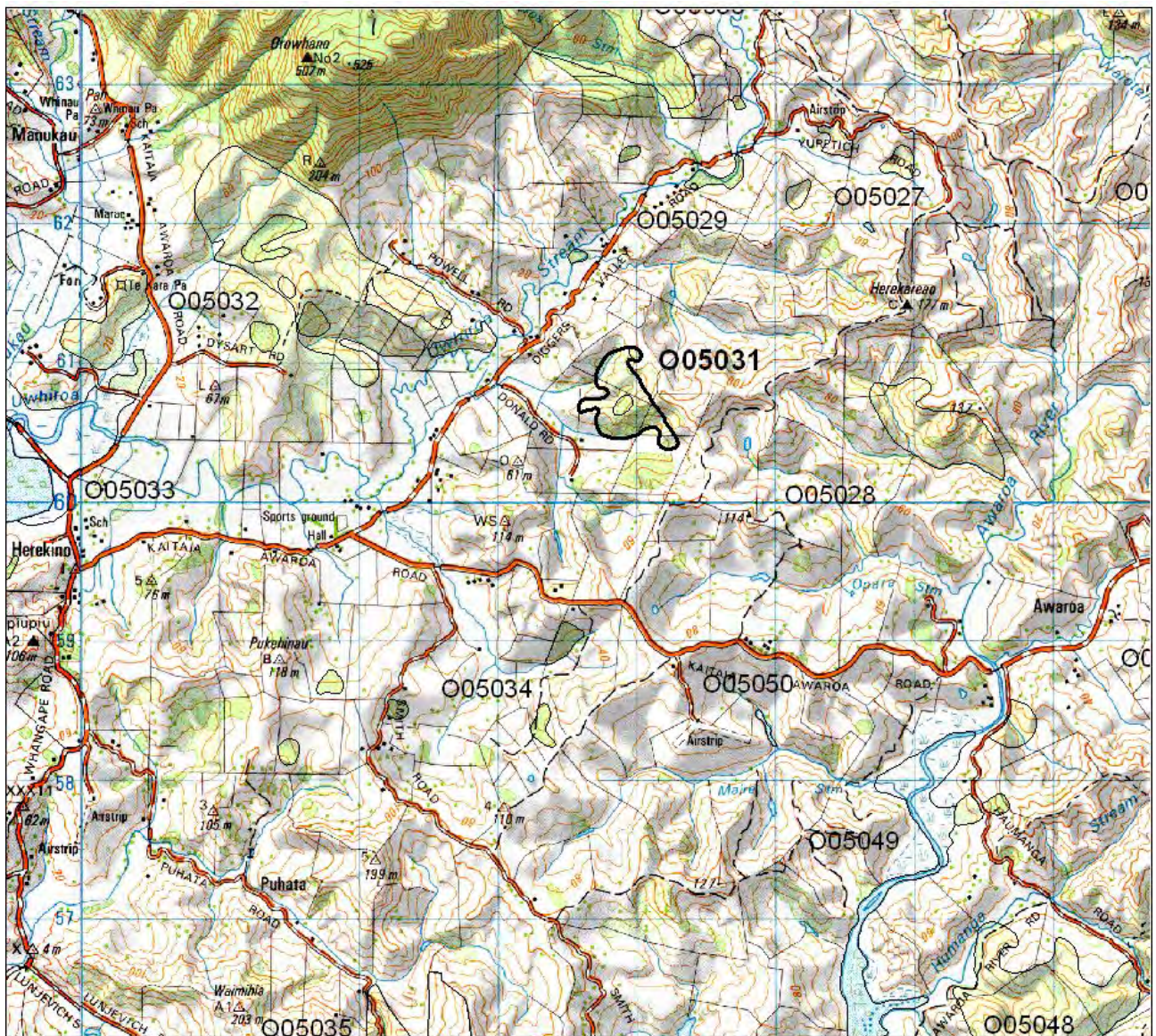
Fauna

Habitat suitable for NI brown kiwi (Serious Decline) which is present in adjacent areas.

Significance

A partial linkage between Herekino Forest and other sites in the Awaroa-Broadwood area and potential refuge for kiwi. Also provides some catchment protection.

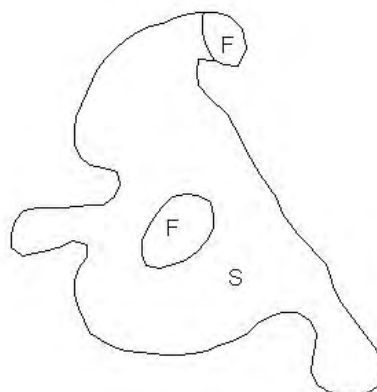
Type (b) is small in extent but is not recorded elsewhere in the Ecological District.



McDonald Rd Bush O05/031

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



SMITH RD FOREST REMNANTS

Survey no.	O05/034
Survey date	10 January 1995
Grid reference	O05 333 583, O05 322 585, O05 314 582 O05 334 589, O05 317 587
Area	13 ha
Altitude	20-80 m asl

Ecological unit

- (a) Kahikatea secondary forest on hillslope
- (b) Kahikatea-kanuka forest on hillslope
- (c) Kahikatea-kanuka-puriri secondary forest on hillslope

Landform/geology

Dissected hill country on Mangakahia Complex sandstone.

Vegetation

Five small secondary podocarp and broadleaf-podocarp remnants.

- (a) The southeastern remnant contains abundant kahikatea with frequent kanuka and taraire. Puriri, totara and nikau are occasional.

The remnant adjacent to Smith Rd also contains abundant kahikatea, type (a), with the occasional puriri and totara.

The northeastern remnant contains abundant kahikatea with frequent totara and occasional puriri.

- (b) Kahikatea and kanuka occurs in some of the other remnants with frequent puriri and taraire. Nikau, rimu, totara and rewarewa are occasional.

- (c) In the northeastern remnant kahikatea, kanuka and puriri occur with frequent totara and occasional nikau.

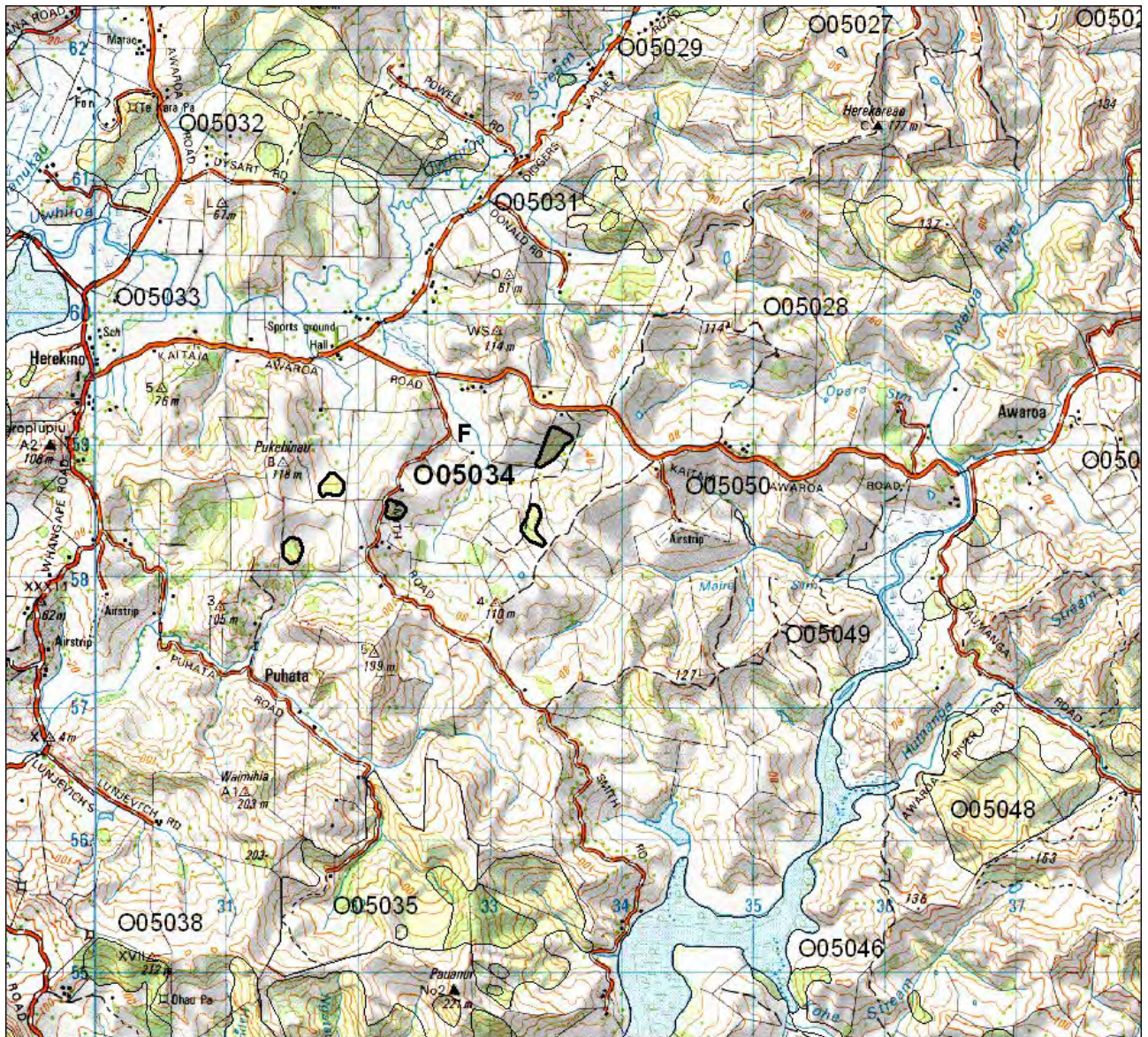
Fauna

Not surveyed.

Significance

Possible seasonal food source for kukupa.

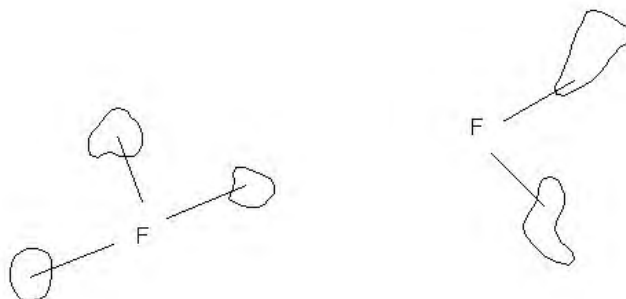
Only record of type (c) and only one of two records of type (b) in the Ecological District but the small size of this site limits its significance.



Smith Rd Forest Remnants O05/034

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



STEPHENS BUSH

Survey no. O05/038
 Survey date 2 March 1995
 Grid reference O05 302 548
 Area 21 ha
 Altitude c. 100–212 m asl

Ecological unit

- (a) Taraire forest on hillslope (90%)
 (b) Manuka–towai shrubland on hillslope (10%)



Stephens Bush O05/038

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

S = shrubland
 F = forest
 W = wetland
 E = estuarine
 D = duneland

(c) Manuka shrubland on hillslope

Landform/geology

Dissected hill country on Mangakahia Complex sandstone.

Vegetation

(a) Most of the site is taraire-dominant with frequent towai, puriri and manuka. Also present are kahikatea, karaka, totara, rewarewa, nikau, ti kouka, lancewood and the occasional northern rata. The canopy is discontinuous in places, especially near the margins.

The sub-canopy consists of kohekohe, *Coprosma areolata*, ponga and houhere. The shrub layer is largely confined to tree ferns and small-leaved *Coprosma* species (due to grazing), although there is more diversity on the steeper slopes near the summit, where *Olearia albida* can be found. A large number of very small seedlings of houhere, kahikatea, mapou and putaputaweta are present. Apart from these, the ground layer consists of threadfern, rasp fern, native grass, hook grass and maidenhair fern.

(b) About 10% of the area is manuka and towai (6 m tall) with ti kouka, puriri, mamangi and kahikatea.

(c) Along a watercourse running below the pa site, a corridor of manuka occurs with frequent ti kouka and occasional kahikatea, puriri, taraire, northern rata, rewarewa, towai, pukatea and mamaku.

Significant flora

Olearia albida (Regionally significant species).

Fauna

Common bush birds.

Significance

This site is of interest due to evidence of coastal influence and combination of plant species but is degraded from stock grazing.

Presence of a regionally significant species.

POUTAWHERA PA SHRUBLAND

Survey no.	O05/039
Survey date	17 February 1995
Grid reference	O05 330 524
Area	26 ha
Altitude	0-127 m asl

Ecological unit

(a) Manuka shrubland on hillslope

Landform/geology

Dissected hill country on Mangakahia Complex sandstone.

Vegetation

Manuka shrubland about 3 m tall with a discontinuous canopy. Scattered pine and mamaku are also present. Soil erosion is apparent, evidently from repeated burning.



Poutawhera Pa Shrubland O05/039

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

Fauna

NI brown kiwi (Serious Decline) in nearby habitat.

Significance

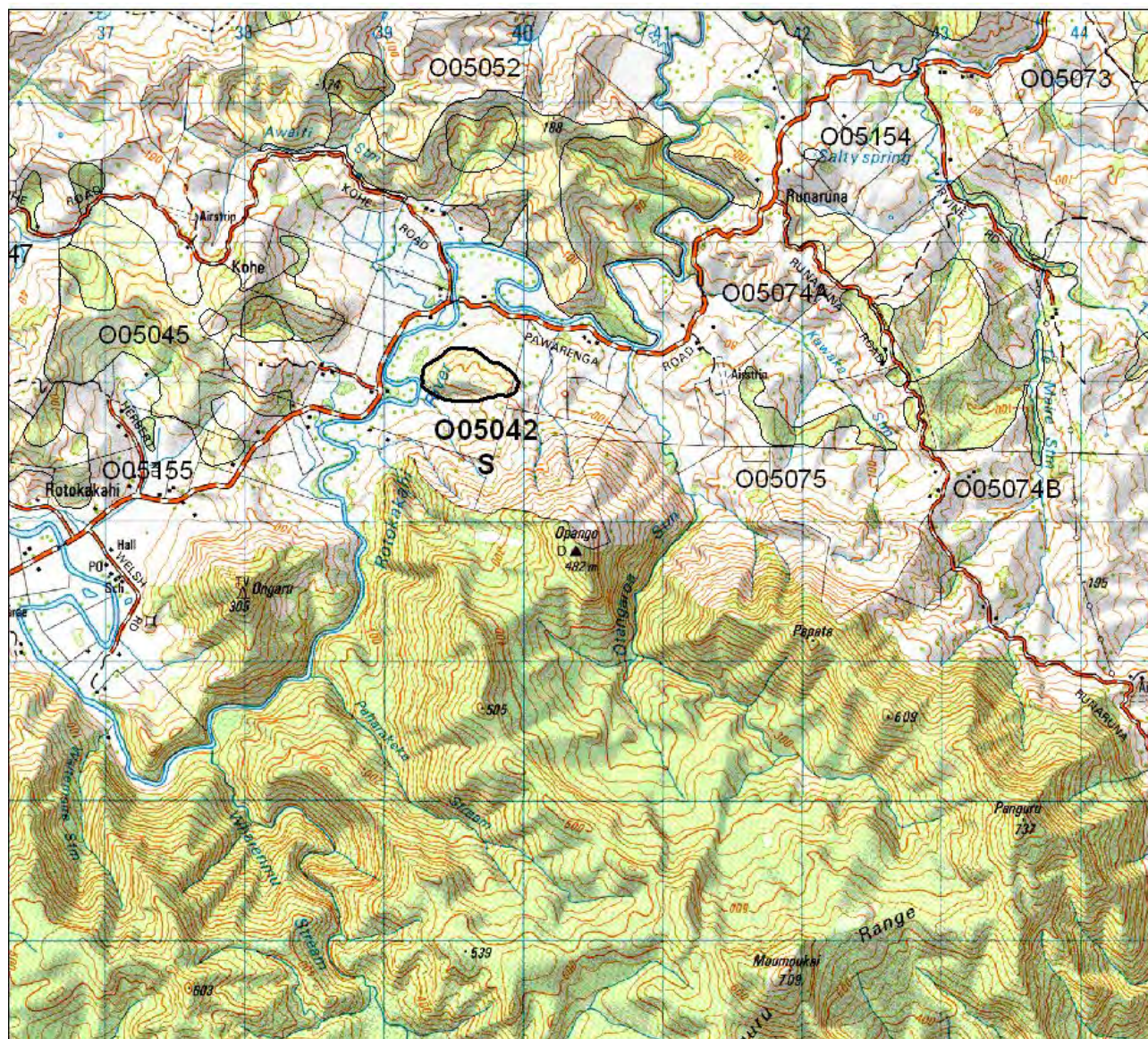
Soil conservation values on steep land bordering Whangape Harbour.

PAWARENGA RD SHRUBLAND

Survey no. O05/042
 Survey date 20 February 1995
 Grid reference O05 396 530
 Area 19 ha
 Altitude 20-120 m asl

Ecological unit

(a) Manuka shrubland on gentle hillslope



Pawarenga Rd Shrubland O05/042

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

S = shrubland
 F = forest
 W = wetland
 E = estuarine
 D = duneland

Landform/geology

Hill country on Mangakahia mudstone bounding the river and Mangakahia Complex sandstone under most of the area.

Vegetation

Manuka shrubland 2-3 m tall with occasional mamaku, tanekaha, kauri and kahikatea.

Fauna

Not surveyed.

Significance

Vegetation close to Rotokakahi River. Further survey required to determine the diversity of species at this site.

TAMAHO RD BUSH

Survey no.	O05/043
Survey date	17 February 1995
Grid reference	O05 347 534, O05 337 529, O05 336 528, O05 343 532
Area	45 ha (19 ha forest, 26 ha shrubland)
Altitude	20m-140 m asl

Ecological unit

- (a) Taraire secondary forest on hillslope
- (b) Manuka-totara forest on hillslope
- (c) Manuka shrubland on hillslope

Landform/geology

Four remnants on dissected hill country of Mangakahia Complex sandstone.

Vegetation

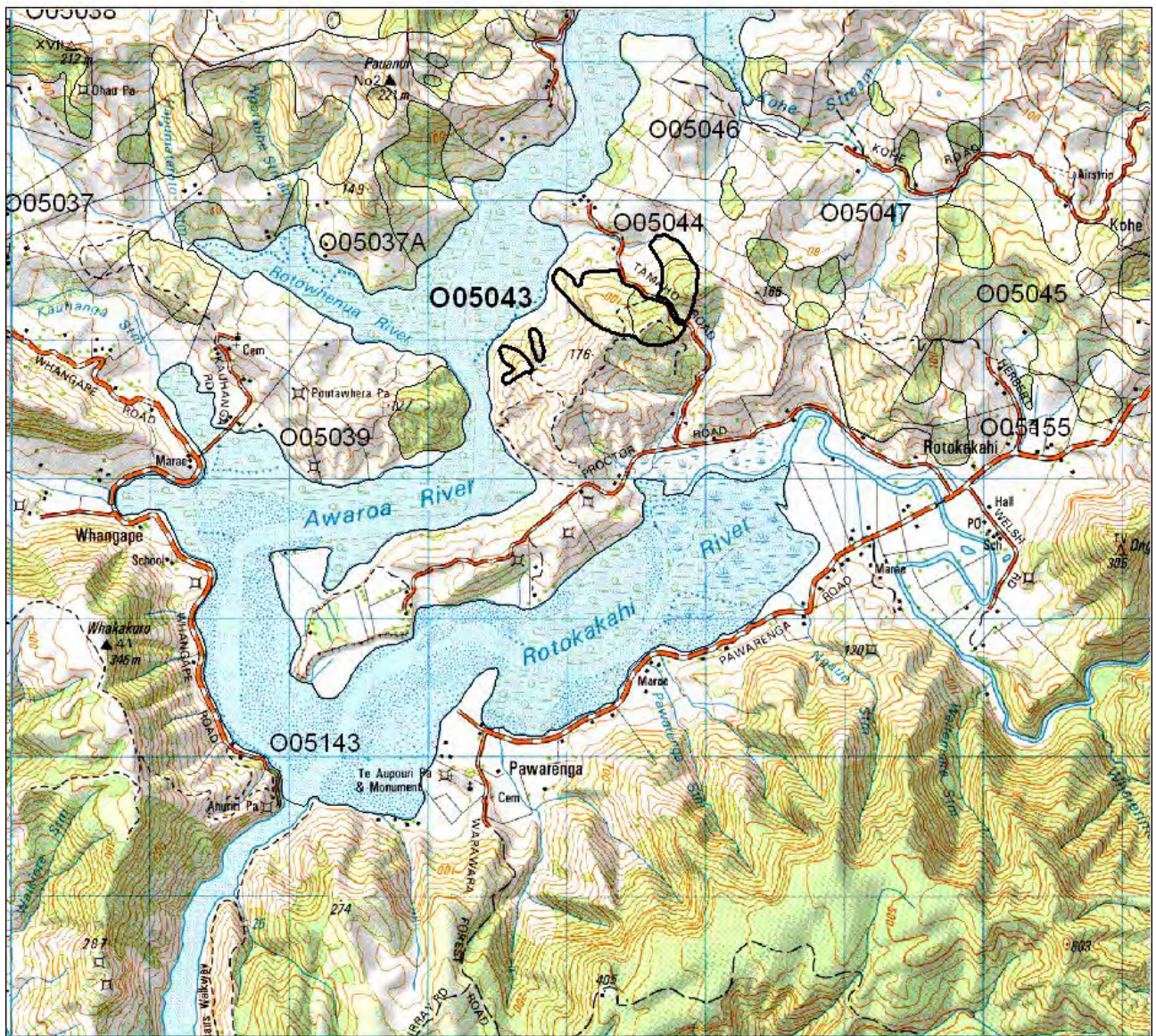
- (a) On the eastern side taraire is abundant with frequent nikau and puriri and occasional kahikatea, rimu and rewarewa.
 - (b) Manuka is abundant and totara common with frequent kahikatea, and occasional puriri and nikau.
 - (c) The remainder is mostly manuka to 6 m tall.
- On the hillside to the south is scattered low manuka.

Fauna

Not surveyed.

Significance

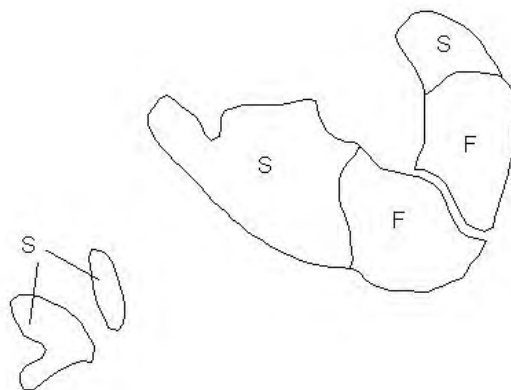
There is considerable erosion on the cleared land in this vicinity, with evidence of extensive siltation in the tidal area adjacent. The retention of the vegetative cover would be advisable.



Tamaho Rd Bush O05/043

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



"165" KOHE BUSH

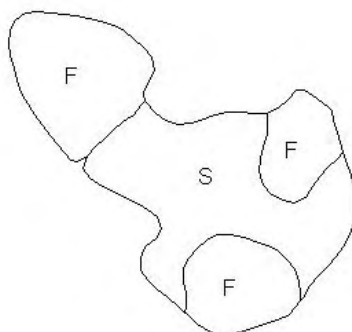
Survey no. O05/044
 Survey date 17 February 1995
 Grid reference O05 356 534
 Area 25 ha (13 ha forest, 12 ha shrubland)
 Altitude 80-140 m asl



" 165 " Kohe Bush O05/044

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

S = shrubland
 F = forest
 W = wetland
 E = estuarine
 D = duneland



Ecological unit

- (a) Manuka shrubland on hillslope (30%)
- (b) Taraire forest on hillslope (50%)
- (c) Manuka forest on hillslope (10%)

Landform/geology

Dissected hill country on Mangakahia Complex sandstone.

Vegetation

- (a) Pockets of bush are linked by manuka shrubland about 4 m tall with scattered totara, rewarewa, ti kouka and kahikatea.
- (b) About half the area is taraire-dominant with frequent nikau and occasional totara, kahikatea, puriri, rimu and northern rata.
- (c) The remaining area is secondary manuka forest with occasional rimu, kahikatea, totara, towai, puriri and nikau.

Fauna

Not surveyed.

Significance

Potential food source for the threatened kukupa.

Regenerating vegetation on steep slopes providing catchment protection.

CANDY BUSH

Survey no.	O05/047
Survey date	17 February 1995
Grid reference	O05 364 543, O05 351 540, O05 362 547
Area	10 ha
Altitude	30-100 m asl

Ecological unit

- (a) Taraire secondary forest on hillslope
- (b) Kahikatea secondary forest on hillslope

Landform/geology

Scattered remnants on hillsides in dissected hill country on Mangakahia Complex sandstone and Mangakahia Complex mudstone in the valley.

Vegetation

Three small forest remnants.

- (a) The southwestern remnant is taraire-dominant with frequent puriri and occasional rewarewa, towai, kahikatea, tawa and totara.
The northeast remnant is also taraire-dominant, type (a) with frequent totara and kahikatea. Kauri, puriri, rewarewa and nikau are occasional.
- (b) In the remaining remnant alongside Kohe Rd, kahikatea is common with frequent rimu and manuka. Puriri, totara, pukatea and towai are occasional.

Fauna

Not surveyed.

Significance

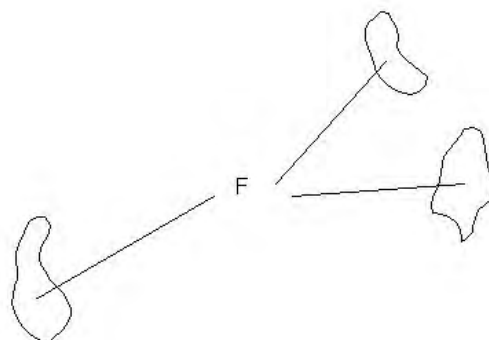
Potential seasonal food source for the threatened kukupa.



Candy Bush O05/047

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



MAIRE STREAM POND

Survey no. O05/050
 Survey date 10 January 1995
 Grid reference O05 349 583
 Area 1 ha
 Altitude c. 20 m asl



Maire Stream Pond O05/050

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

S = shrubland
 F = forest
 W = wetland
 E = estuarine
 D = duneland



Ecological unit

- (a) Constructed pond in gully
- (b) Raupo reedland on pond margin

Landform/geology

A pond in a valley surrounded by Mangakahia Complex sandstone hill country.

Vegetation

- (a) An artificial pond with a small amount of raupo, type (b) on the margins, surrounded by pasture.

Fauna

Not surveyed.

Significance

Potential waterbird habitat.

GROUND – HAUMANGA RD BUSH

Survey no.	O05/051
Survey date	10 January 1995
Grid reference	O05 382 556
Area	4 ha
Altitude	40–80 m asl

Ecological unit

- (a) Taraire forest on moderate to steep hillslope (60%)
- (b) Kanuka–totara forest on moderate to steep hillslope (40%)

Landform/geology

Valley in dissected hill country on Mangakahia Complex sandstone.

Vegetation

- (a) Abundant tall taraire occurs in over half of this site with frequent emergent rimu and totara. Other species occurring are puriri, towai, rewarewa, kauri, nikau and emergent kahikatea.
- (b) There is also an area of secondary kanuka and totara forest with scattered puriri, kahikatea and towai. The understorey consists of kohekohe, mahoe, and ponga.

Fauna

Not surveyed.

Significance

A fenced forest remnant providing seasonal food source for the threatened kukupa and a link between Pareokawa and other sites at Pawarenga.



Grounds-Haumanga Rd Bush O05/051

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

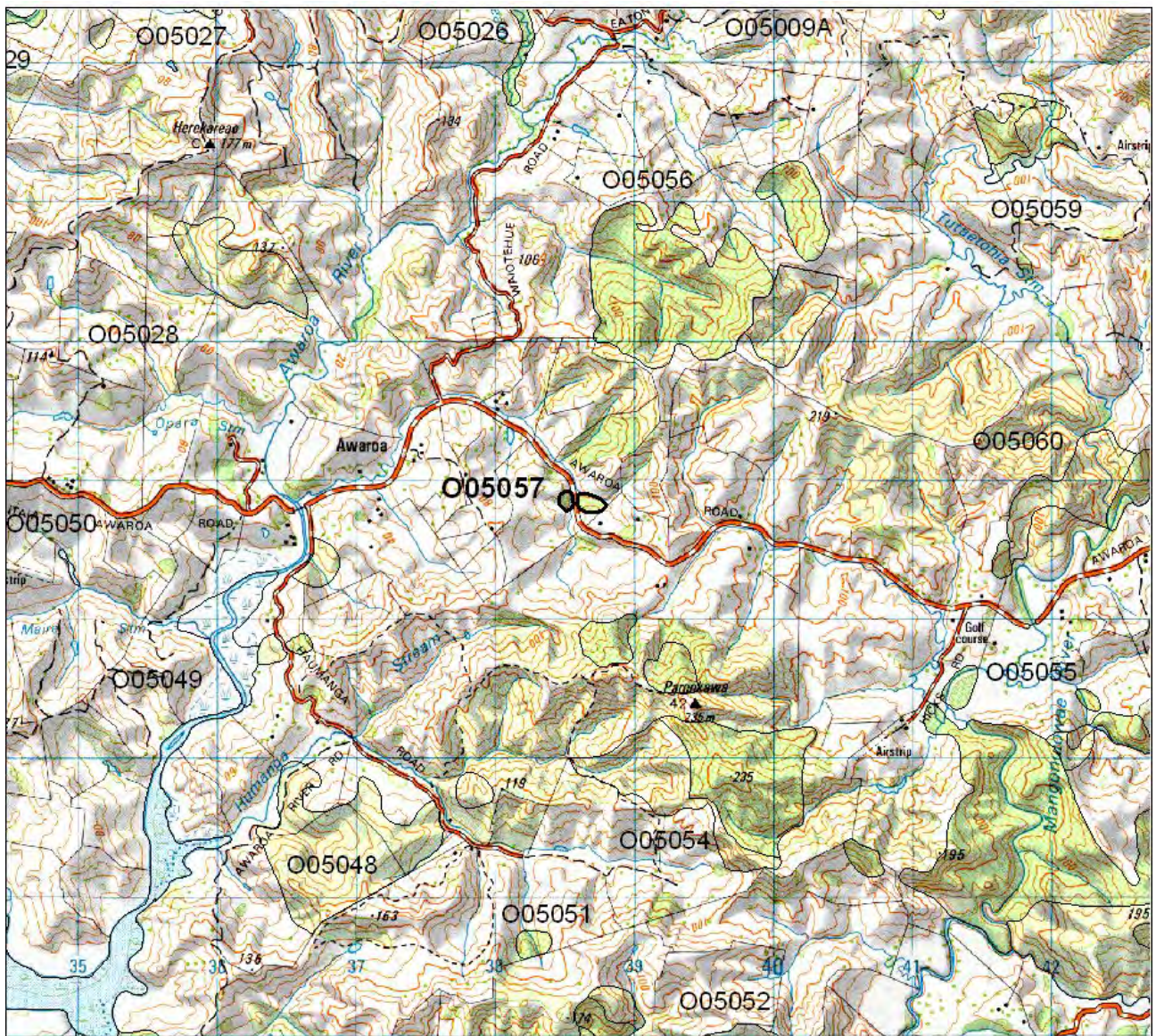
S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

AWAROA RD BUSH

Survey no.	O05/057
Survey date	10 January 1995
Grid reference	O05 385 588, O05 386 588
Area	3 ha
Altitude	40-60 m asl

Ecological unit

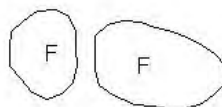
(a) Taraire forest on steep hillslope



Awaroa Rd Bush O05/057

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



Landform/geology

Dissected hill country on Mangakahia Complex sandstone.

Vegetation

Taraire is abundant in these two remnant areas divided by the highway. Totara, kahikatea, towai, puriri, rewarewa and nikau also occur.

Fauna

Not surveyed.

Significance

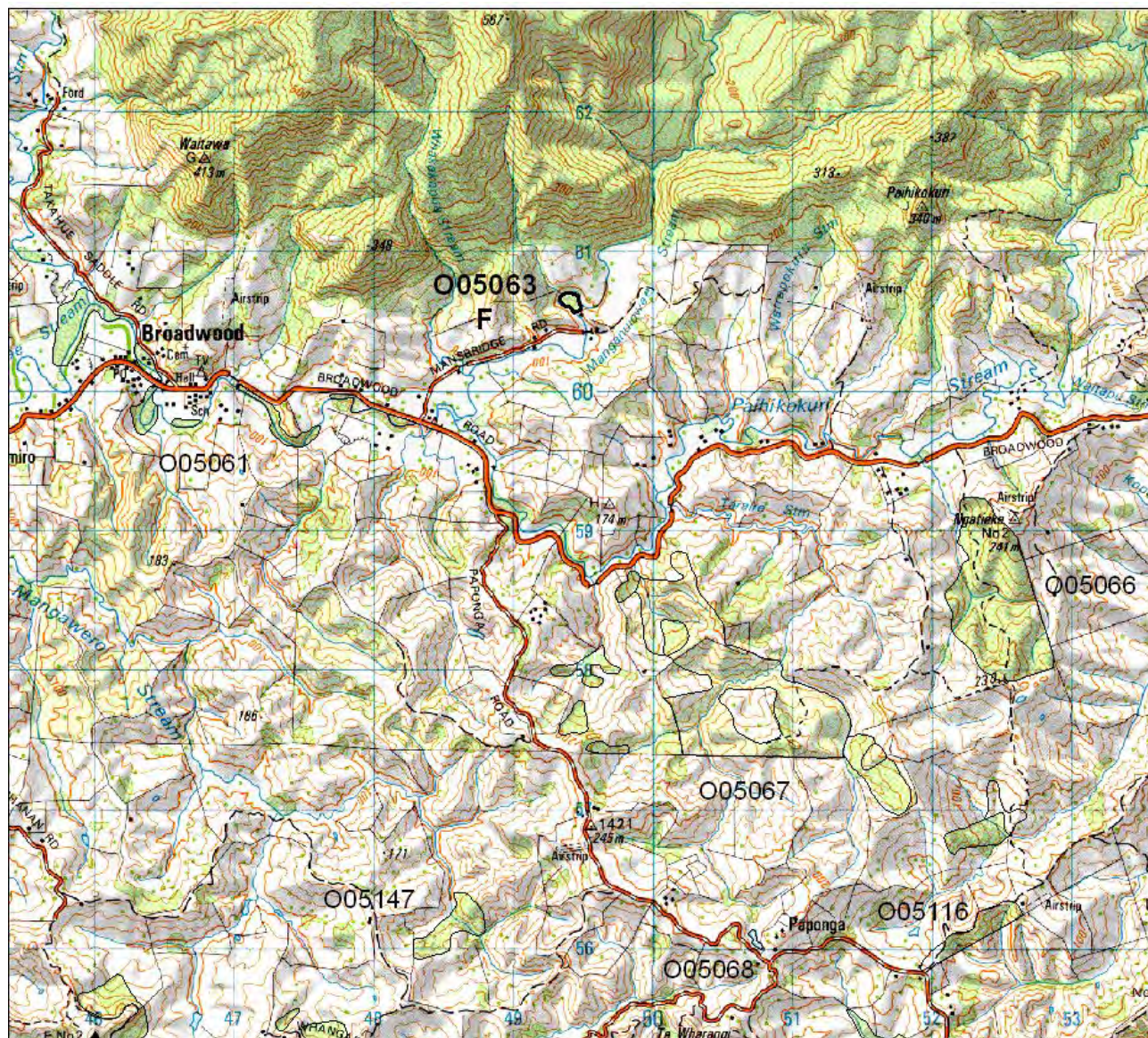
Potential seasonal food source for the threatened kukupa.

MANSBRIDGE SCENIC RESERVE

Survey no. O05/063
Survey date 20 February 1995
Grid reference O05 494 606
Area 1 ha
Altitude c.100 m asl

Ecological unit

(a) Taraire flood forest on alluvium



Mansbridge Scenic Reserve O05/063

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

Landform/geology

Valley alluvium with adjoining Mangakahia Complex sandstone hillside at Broadwood.

Vegetation

A small flood forest remnant with an open canopy in which taraire is abundant. Totara, kohekohe, titoki, kahikatea, towai and northern rata are present.

The understorey consists mainly of mistflower and small-leaved *Coprosma* species.

Fauna

Not surveyed.

Significance

Broadleaf flood forest is a priority habitat for protection within Northland; however, this site is small, degraded and requires fencing and weed eradication.

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

PAPONGA POND

Survey no.	O05/068
Survey date	27 February 1995
Grid reference	O05 507 560
Area	1 ha
Altitude	c. 180 m asl

Ecological unit

- (a) Constructed pond
- (b) Harakeke-raupo reedland on pond margin

Landform/geology

Pond at the head of a valley surrounded by hills of Mangakahia Complex sandstone.

Vegetation

- (a) Artificial pond.
- (b) Harakeke and raupo occur on the pond margin.

Fauna

Pied shag (Sparse) and mallard.

Significance

Habitat for common waterbirds including a threatened species.

Only site record for type (b) in the Ecological District, but the size of this site and the extent of the vegetation limits its significance.

BEER BUSH

Survey no. O05/070
Survey date 28 February 1995
Grid reference O05 488 539
Area 18 ha
Altitude 100-140 m asl

Ecological unit

(a) Taraire secondary forest on hillslope



Beer Bush O05/070

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

(b) Kahikatea-totara secondary forest on toeslope

Landform/geology

Dissected hill country on Mangakahia Complex sandstone.

Vegetation

(a) Taraire is abundant throughout most of this area with frequent towai. Puriri, pukatea, rewarewa, rimu, totara, northern rata, nikau and kauri also occur.

(b) In the lower part of the area, kahikatea and totara are common with rimu and kanuka occurring frequently. Rewarewa, towai, pukatea and nikau also occur.

Fauna

Not surveyed.

Significance

Potential seasonal food source for the threatened kukupa.

RUNARUNA SCENIC RESERVE

Survey no.	O05/073
Survey date	16 January 1995
Grid reference	O05 450 558, O05 444 555, O05 443 562, O05 450 563
Area	42 ha (17 ha forest, 25 ha shrubland)
Altitude	70-180 m asl

Ecological unit

(a) Towai secondary forest on hillslope

(b) Manuka shrubland on hillslope

(c) Kanuka/manuka shrubland on hillslope and in gully

(d) Kanuka-totara forest on hillslope

(e) Taraire secondary forest on hillslope

(f) Kahikatea-totara secondary forest on hillslope

Landform/geology

Dissected hill country running down to gentler slopes in the valley on Mangakahia Complex sandstone.

Vegetation

Four remnants.

(a) Towai is common with frequent kanuka and totara. Rimu and kahikatea are occasionally emergent over rewarewa, miro and taraire. Hinau, lancewood, and makamaka are also present.

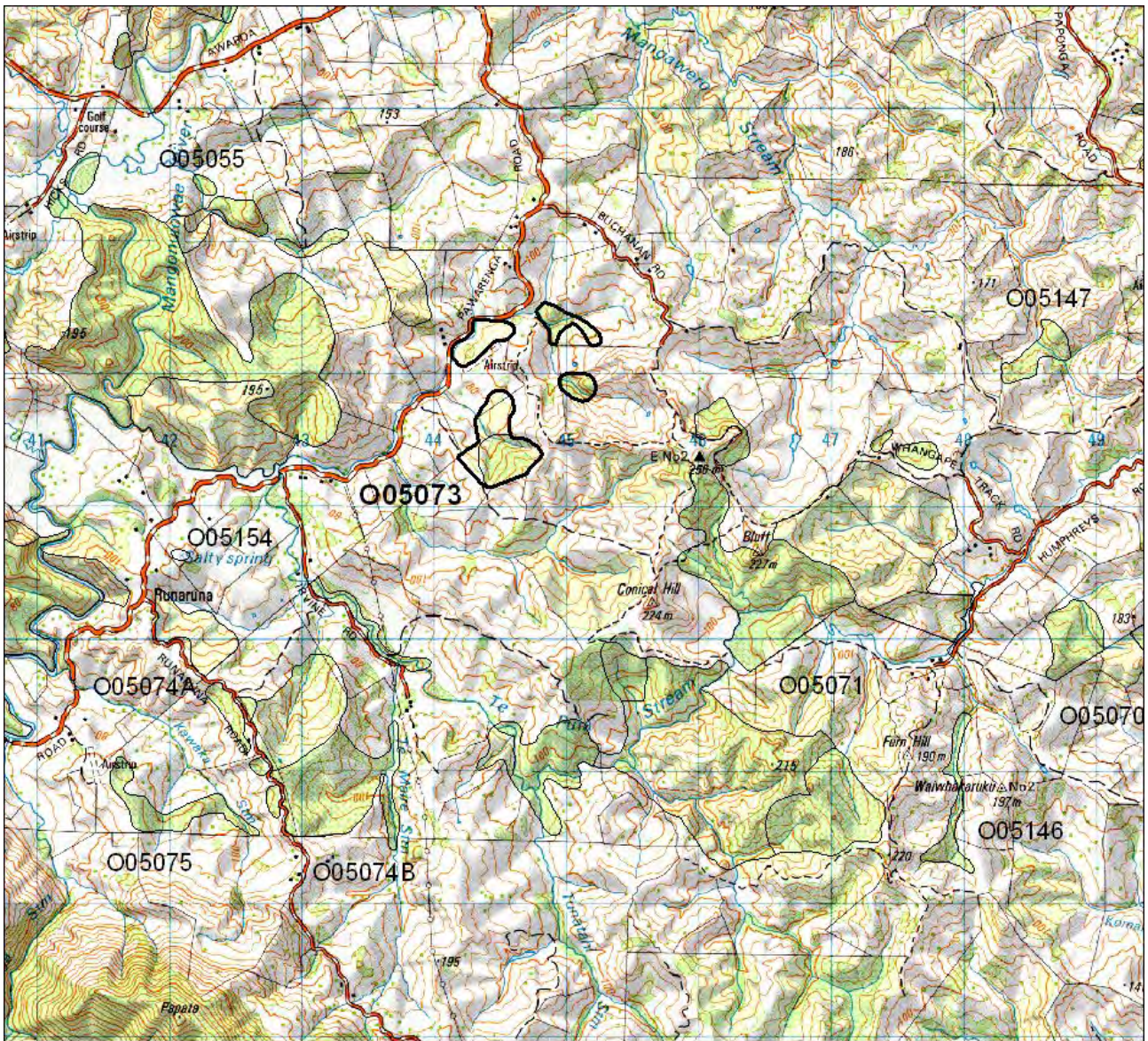
(b) On the margins is manuka 4-6 m tall with occasional towai and puriri.

The understorey contains mamangi, houhere, heketara, pigeonwood, and kiekie with occasional putaputaweta. The ground cover is sparse due to grazing.

Along the roadside to the north is an area of manuka shrubland with a small pocket of secondary podocarp.

(c) In gullies to the east kanuka/manuka shrubland is abundant.

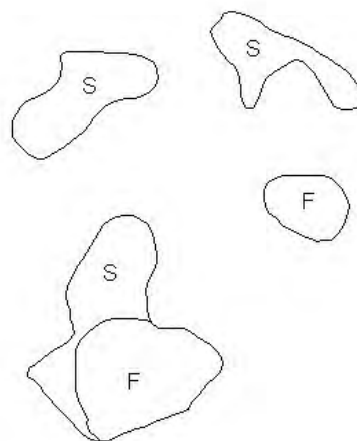
(d) Kanuka with totara occurs with occasional rewarewa.



Runaruna Scenic Reserve O05/073

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



(e) Taraire is common with frequent towai and occasional totara, rimu, pukatea, rewarewa, kahikatea and northern rata.

(f) A small area of kahikatea and totara is present with frequent manuka.

Fauna

Kukupu (Gradual Decline) and kauri snail (Gradual Decline).

Significance

Habitat for the threatened kukupa and kauri snail and some riparian protection along watercourses. However, the fragmented nature of this site does not warrant Level 1 status.

The Department of Conservation administers 8 ha of this site as Scenic Reserve.

RUNARUNA RD SHRUBLAND

Survey no.	O05/074A
Survey date	16 January 1995
Grid reference	O05 422 540
Area	20 ha
Altitude	80-140 m asl

Ecological unit

(a) Manuka shrubland on hillslope

Landform/geology

Dissected hill country on Mangakahia Complex sandstone.

Vegetation

Manuka shrubland 2-3 m tall.

Fauna

Not surveyed.

Significance

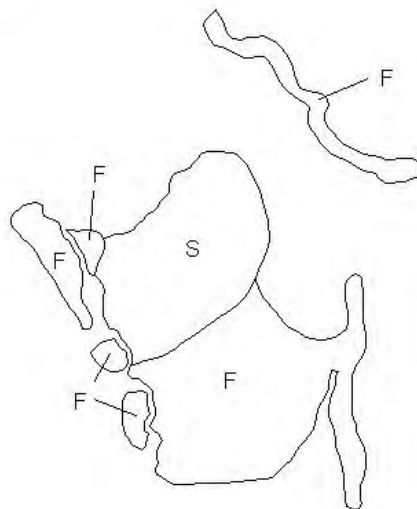
NI brown kiwi have been found in similar habitats. Survey recommended.



Irvine Rd Bush O05/074B

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



Ecological unit

- (a) Kahikatea-totara forest on hillslope
- (b) Kahikatea-taraire forest on hillslope
- (c) Taraire forest on hillslope
- (d) Kanuka shrubland on hillslope

Landform/geology

Dissected hill country on Mangakahia Complex sandstone, including some headwater catchments, and with alluvial flats in the Te Puia Stream Valley.

Vegetation

- (a) On the western side of Runaruna Rd kahikatea and totara forest occurs in the northern remnant. Towai is frequent, and puriri, nikau, pukatea, kauri, rimu, rewarewa, emergent northern rata and taraire are occasional.
- (b) Moving south along this road to the most southern remnant, kahikatea and taraire are common in the canopy. Totara is frequent and towai, puriri, rimu, rewarewa and pukatea are occasional.
- (c) Taraire occurs in the main forested area with frequent kahikatea and towai. Nikau, rimu and totara are occasional.
- (d) The main block of shrubland is kanuka with occasional kahikatea, totara and puriri. The regeneration is scattered and the canopy discontinuous. The understorey contains tree ferns, small-leaved *Coprosma* species, rasp fern and mistflower, and appears heavily grazed.

Fauna

Not surveyed. Habitat suitable for NI brown kiwi (Serious Decline), which have been reported in the adjacent area and are highly likely to be present.

Significance

A large, diverse area with riparian and catchment values.

Further survey recommended to establish the full ecological significance of this site.

PANGURU BUSH REMNANT

Survey no.	O05/093
Survey date	28 June 1994
Grid reference	O05 462 477
Area	32 ha (16 ha forest, 16 ha shrubland)
Altitude	40-190 m asl

Ecological unit

- (a) Towai forest on hillslope (70%)
- (b) Kanuka/manuka-totara forest on hillslope (30%)

Landform/geology

This small secondary forest remnant occurs on dissected hill country underlain by Mangakahia Complex sandstone.

Vegetation

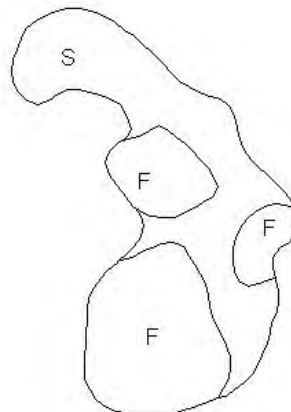
Part of a partial link between the large forest of the Warawara tract and the moderate sized remnants associated with the Tapuwae Forest. Many of the gaps



Panguru Bush Remnant O05/093

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



previously occupied by pasture are now in *Pinus radiata* and will provide a linkage between remnants assisting the movement of species such as the threatened NI brown kiwi and NI tomtit.

(a) Most of the remnant is towai which is common. Taraire, kanuka/manuka, puriri, and kahikatea are frequent with occasional totara, hinau, mamangi, rewarewa, karaka, rimu, pukatea and emergent northern rata.

(b) Kanuka/manuka is abundant with totara common in the remainder of the site. Mamangi is frequent with occasional kahikatea, tanekaha, towai, taraire, puriri and mamaku.

Fauna

Not surveyed.

Significance

Close proximity to larger forest tracts and contiguous with plantation forest implies a probable linkage and refuge function, especially important during the harvest of adjoining pines.

PUKETAWA RD BUSH

Survey no.	O05/095
Grid reference	O05 464 492, O05 465 484
Area	65 ha (51 ha forest, 14 ha shrubland)
Survey date	27 June 1994
Altitude	40–140 m asl

Ecological unit

(a) Towai forest on hillslope (40%)

(b) Kanuka/manuka forest on hillslope (40%)

(c) Taraire-towai forest in valley and on hillslope (10%)

Landform/geology

It lies on dissected hill country underlain by Mangakahia Complex sandstone.

Vegetation

A forest remnant forming part of the chain which helps to link Warawara Forest (Ahipara Ecological District) to other large forests to the north and east. The gaps in this chain are progressively being filled in by exotic plantation forestry and small native enclaves such as this will become increasingly important as refuges, especially during harvest.

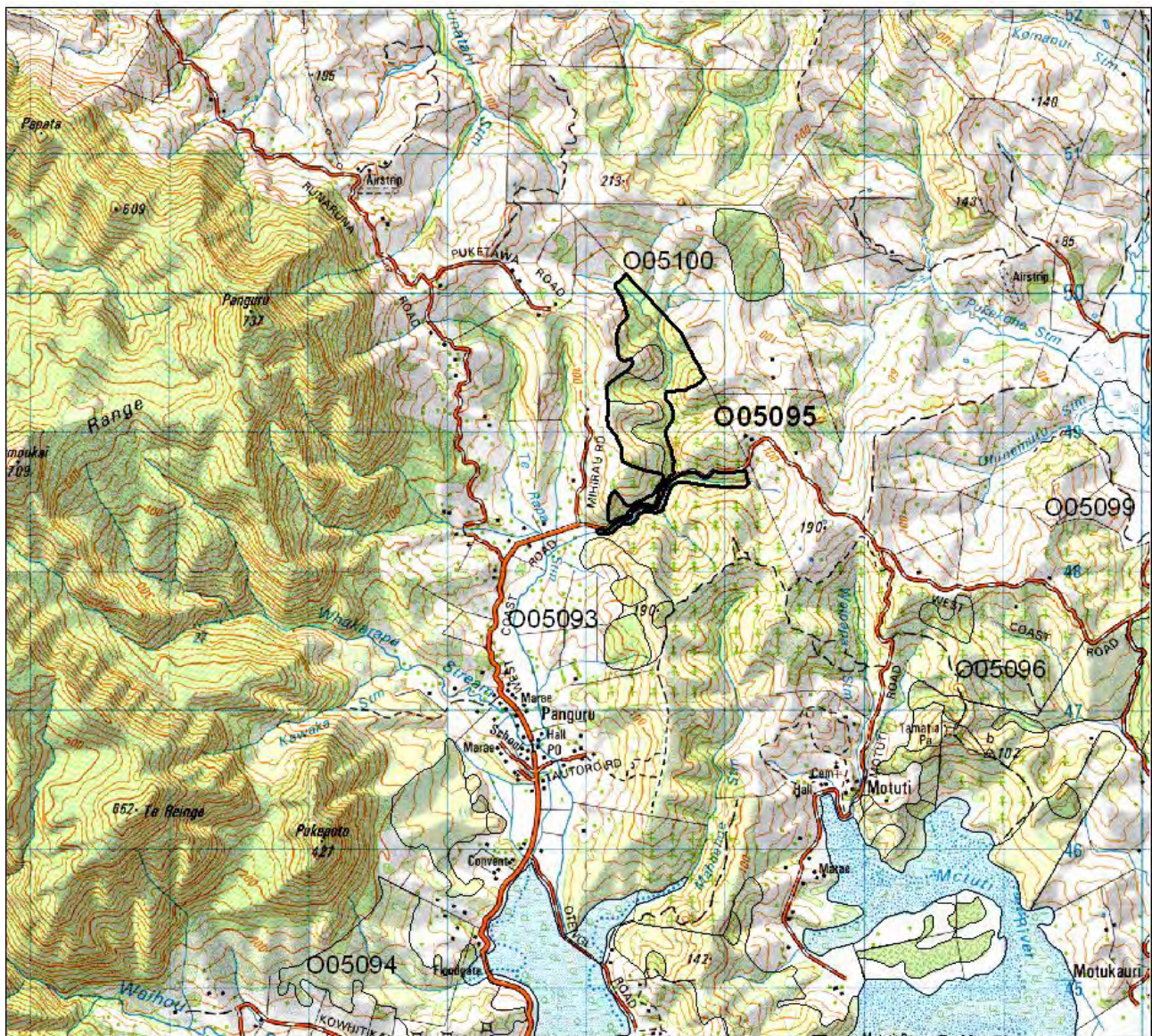
(a) Towai forest with frequent puriri, kahikatea, tanekaha, totara, kanuka, nikau and occasional matai, rimu, tawa, hinau, pukatea and emergent northern rata.

(b) Kanuka/manuka forest with frequent kahikatea and occasional totara and tanekaha.

(c) Taraire and towai forest with frequent kahikatea, rewarewa, puriri, kanuka, nikau and tawa. Kohekohe, houhere, pukatea, miro, hinau and mamaku are occasional.

Fauna

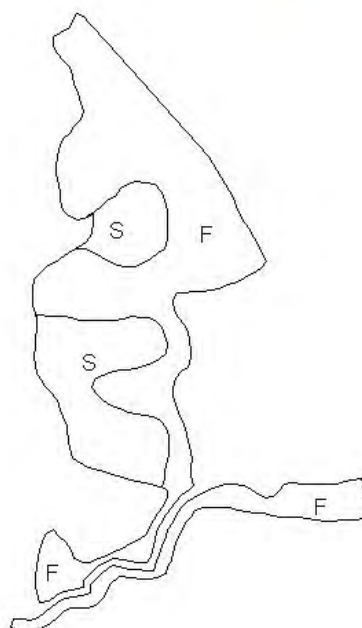
Not surveyed.



Puketawa Rd Bush 005/095

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



Significance

Forms a linkage and refuge function between forests.

Further survey is recommended to establish the full ecological significance of this site.

MIHIRAU BUSH

Survey no.	O05/100
Survey date	28 June 1994
Grid reference	O05 471 502
Area	24 ha
Altitude	60-190 m asl

Ecological unit

- (a) Kanuka/manuka forest on hillslope
- (b) Kahikatea-puriri-towai forest on hillslope
- (c) Taraire-towai forest on hillslope

Landform/geology

Dissected hill country underlain by Mangakahia Complex sandstone.

Vegetation

A relatively small forest remnant with a mix of cutover and secondary forest associations.

- (a) Kanuka/manuka forest with occasional towai, totara, houhere, mamangi and kahikatea.
- (b) Kahikatea, puriri and towai are common in the canopy with frequent kanuka and nikau and occasional totara, kohekohe, pukatea, rimu and rewarewa.
- (c) Taraire and towai are also common with frequent rewarewa and puriri and occasional miro, pukatea, rimu, northern rata, tawa and nikau.

Fauna

Not surveyed.

Significance

This site is completely surrounded by plantation forestry which will be adding to its value as an indigenous forest enclave within the newly planted link being formed through to the north end of the Tapuwae Forest tract. This planted forest should become a valuable habitat and means of dispersal for several species, including NI brown kiwi.

Only site in the Ecological District where type (b) has been recorded.



Te Konoke Bush O05/121

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

(b) Taraire-towai forest on hillslope (85%)

Landform/geology

Underlain by Mangakahia Complex sandstone.

Vegetation

A small cutover, secondary forest remnant.

(a) Tanekaha is abundant with common kanuka/manuka and totara. Towai is frequent with occasional kohekohe, puriri and rewarewa.

(b) This site is dominated by a taraire and towai association with frequent tanekaha, totara, rimu, puriri and kahikatea. Occasional species include miro, rewarewa, kohekohe, matai and emergent kahikatea, northern rata and rimu.

Fauna

Common forest birds.

Significance

Although small and largely cutover in nature, this site retains an emergent podocarp element.

Only site for type (a) recorded in the Ecological District.

Further surveying is required to establish further ecological significance.



Mudgeway Rd Bush O05/126

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

MUDGEWAY RD BUSH

Survey no.	O05/126
Survey date	10 June 1994
Grid reference	O05 642 571
Area	12 ha
Altitude	60-150 m asl

Ecological unit

(a) Puriri-taraire-towai forest on hillslope

Landform/geology

It is situated on dissected hill country underlain by Mangakahia Complex sandstone.

Vegetation

A small secondary cutover remnant and an outlier of the Omahuta Forest tract, exhibiting a diversity of forest species. Puriri, taraire and towai are common in the canopy with frequent kahikatea, totara, and titoki and occasional tawa, rimu, pukatea, kohuhu, nikau, rewarewa and kawaka.

Fauna

Not surveyed.

Significance

The close proximity of a large forest tract greatly improves the potential ecological value of this remnant which is also notable for its diversity of canopy species.

UPPER MANGAWERO STREAM TRIBUTARY REMNANT

Survey no.	O05/147
Survey date	17 July 1995
Grid reference	O05 485 561
Area	11 ha
Altitude	120-160 m asl

Ecological unit

(a) Kahikatea-kanuka-taraire-totara forest on hillslope

Landform/geology

Hill country of Mangakahia Complex sandstone, bordering on siliceous mudstone in the east.

Vegetation

A podocarp-broadleaf remnant of kahikatea, kanuka, taraire, and totara with occasional puriri, rimu and towai. The surrounding area is being planted in pines.

Fauna

Not surveyed.

Significance

Riparian protection and potential seasonal food source for the threatened kukupa.

Kahikatea-kanuka-taraire-totara forest is unrecorded elsewhere in the Ecological District; however, further survey required to establish the full ecological significance of this site.



Upper Mangawero Stream Tributary Remnant O05/147

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

WHAKAOMA/HURAUNUI STREAM SECONDARY FOREST REMNANT

Survey no.	O05/150
Survey date	3 May 1995
Grid reference	O05 630 550
Area	11 ha
Altitude	20-60 m asl



Whakaoma/Huraunui Stream Secondary Forest Remnant O05/150

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

Ecological unit

- (a) Kanuka/manuka shrubland on gentle hillslope
- (b) Totara secondary forest on gentle hillslope

Landform/geology

Dissected hill country and valley underlain by Mangakahia Complex mudstone.

Vegetation

A small secondary forest remnant.

- (a) Kanuka/manuka shrubland with occasional totara, kahikatea, tanekaha and rimu.
- (b) Totara forest with frequent kanuka and occasional kahikatea, rimu and taraire.

Fauna

Not surveyed.

Significance

This site provides a water and soil protection function.

KAHIKATOA RD POND

Survey no. O05/153

Survey date 14 January 1994



Kahikatoa Rd Pond O05/153

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland



Grid reference O05 610 555

Area 1 ha

Altitude 40 m asl

Ecological unit

Constructed pond in gully

Landform/geology

Located at a fault contact between Mangakahia Complex sandstone and Motukaraka Facies indurated sandstone and mudstone.

Vegetation

The pond has steep sides with raupo, harakeke, ti kouka, mamaku, *Coprosma robusta*, kowhai, pampas, willow, *Juncus* and *Carex* spp., pines and eucalypts and other exotic trees.

Fauna

Common waterbirds.

Significance

Habitat for waterbirds.

KOUTU SHRUBLAND

Survey no. O06/011

Survey date 5 May 1994

Grid reference O06 484 366, O06 485 365

Area 5 ha

Altitude 10 m asl

Ecological unit

Manuka shrubland on marine terrace

Landform/geology

A small shrubland remnant on marine-cut terrace of Mangakahia Complex siliceous mudstone.

Vegetation

Strongly manuka dominant with occasional gorse and mamaku. *Gleichenia dicarpa* occurs in the understorey with *Coprosma* sp. and mapou.

Fauna

A dense population of NI fernbird (Sparse) was recorded by the New Zealand Wildlife Service in 1978, but the area has since undergone a reduction in area of almost 90%.

Significance

While fernbird are still likely to be present and may occupy adjoining gorse clad hills, the value of the site has been greatly reduced by the reduction of overall area.

The Department of Conservation administers one hectare of Recreation Reserve within this site.



Koutu Shrubland O06/011

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

S = shrubland
F = forest
W = wetland
E = estuarine
D = duneland

5. Summary and conclusions

5.1 ANALYSIS OF EXISTING PROTECTED AREAS

The Protected Natural Areas network in the Hokianga Ecological District, which includes the three harbours, is summarised in Table 1.

TABLE 1. PROTECTED NATURAL AREA NETWORK IN THE HOKIANGA ECOLOGICAL DISTRICT (areas in ha).

Key: QEII = Queen Elizabeth National Trust Covenant; CC = Conservation Covenant; SL = Stewardship Land; SR = Scenic Reserve; GP = Government Purpose Reserve; RR=Recreation Reserve; MS = Marginal Strip

Site	Survey no.	Status							Total area protected	Total site area
		CC	SL	SR	GP	RR	MS	QEII		
Eaton Rd Bush	O05/009A	15							15	67
Mangakotukutuku Stream Forest	O05/016	94							94	155
Waiotehue Reserve	O05/019		11						11	12
Pearce Block Remnants	O05/020	13.8							13.8	41
Wiseman Block	O05/022	31.4							31.4	61
Upper Uwhiroa Catchment Remnants	O05/023							54	54	54
Otaneroa Scenic Reserve	O05/025			2					2	10
Waiotehue Stream Bush	O05/026						4		4	11
Dysart/Powell Rd Bush	O05/032		1						1	144
Upper Herekino River	O05/033						2		2	81
Rotokakahi River & Surrounds	O05/052			47					47	250
Pareokawa Bush	O05/054			69					69	132
Mangonuiwae Bush	O05/055		1		123				124	322
Broadwood Riparian Remnants	O05/061			7			2		9	25
Mansbridge Scenic Reserve	O05/063			1					1	1
Landcorp Paponga Remnants	O05/067		9						9	119
Runaruna Scenic Reserve	O05/073			8					8	44
Wharekauere Bush Remnants	O05/087						1		1	265
Tapuwae Scenic Reserve	O05/097			208					208	406
Tapuwae Forest & Outliers	O05/115		507	305					812	1174
Te Tio Rd Bush	O05/123		1					3.8	4.8	40.5
Rawhia Remnants	O05/149						2		2	18
Hautau Stream Remnant	O05/151		2						2	55
Hokianga Harbour	O05/152		114				35		149	11065
Reena Bush	O05/156	3							3	165
Opara Rd QEII Remnant	O05/157							10	10	19
Waoku Rd Bush	O06/003						2		2	175
Koutu Shrubland	O06/011					1			1	5
Hokianga North Head Coastal Associations	O06/034		415				69		484	1155
Rangi Point Remnants	O06/035		1						1	99
Taumatawhauwhau Forest Outlier	P06/023	5							5	262
TOTAL		117	1062	647	123	1	117	67.8	2180	16432.5

Approximately 8.3 % of the natural areas of the Hokianga Ecological District are formally protected which is equivalent to about 2.5 % of the total area of the Ecological District. Excluding the three harbours, approximately 15.6 % of the natural areas of the Hokianga Ecological District are formally protected (2.9% of total District).

A list of ecological units recorded in the Hokianga Ecological District and their current protection status is set out in Table 2 (page 250) and a summary of the site evaluations is given in Table 3 (page 272).

Ecological units protected

Freshwater wetlands

Only a very small area of freshwater wetlands is protected in this Ecological District:

- Wiseman Block (O05/022) – raupo reedland – approximately 0.5 ha.
- Hautau Stream Remnant (O05/151) – *Coprosma propinqua* swamp shrubland – 2 ha.
- Upper Herekino River (O05/033) – estuarine/freshwater wetlands – 2 ha.

Estuarine

One of the most significant areas in the Ecological District (and Northland) is the Hokianga Harbour (O05/152); 149 ha are protected, most of which is saltmarsh, with an estimated 10% being mangroves.

This equates to only 2.3% of the exposed intertidal area, and assuming the majority of the protected area is vegetated, just 5% of the vegetated area. Combined with the fact that much of the vegetated harbour margin is grazed, this entire habitat type is very much under-represented in the protected areas network.

In the Herekino Harbour (N05/041) only 2 ha of marginal strip protects values in an 81 ha site. No intertidal areas are protected in Whangape Harbour (O05/143).

Coastal

The total area protected is 263.8 ha or about 9% of the remaining coastal habitats, most of which lies within Tapuwae Scenic Reserve (O05/097) (208 ha of mostly (at least 98%) secondary coastal forest). This is less than 2% of the remaining terrestrial habitat in the Ecological District. The other coastal vegetation types protected include:

- Te Tio Rd Bush (O05/123) – puriri-tanekaha-taraire-totara coastal forest, kanuka forest (4.8 ha).
- Rawhia Remnants (O05/149) – kanuka/manuka coastal forest (2 ha).
- Opara Rd QEII Remnant (O05/157) – manuka-tanekaha coastal forest (10 ha).
- Koutu Shrubland (O06/011) – manuka shrubland (1 ha).
- Wharekauere Bush Remnants (O05/087) – manuka shrubland (1 ha).
- Hokianga North Head Coastal Associations (O06/034) – pohutukawa forest, kanuka/manuka-towai forest and karaka-kohekohe-kowhai-puriri forest (37 ha).
- Rangi Point Remnants (O06/035) – kanuka/manuka shrubland (1 ha).

TABLE OF COASTAL SITES

SITE NAME	SITE NO.	AREA OF SITE (ha)
Rotowhenua River Shrubland	O05/037A	5
Kohe Stream Remnants	O05/046	21
Wharekauere Bush Remnants	O05/087	265
Te Karaka Point Coastal Forest	O05/089	60
Motuti Coastal Remnants	O05/091	203
Panguru/Pukepoto Shrublands	O05/094	125
Tapuwae Scenic Reserve	O05/097	406
Tapuwae River Bush	O05/098	78
Motukaraka Remnant	O05/112	7
Te Tio Rd Bush	O05/123	36
Orira River Remnants	O05/148	68
Hautau Stream Remnant	O05/151	56
Opara Rd QEII Remnant	O05/157	20.7
Wheoki Stream/Pukemaire Remnants	O06/009	135
Hokianga North Head Coastal Associations	O06/034	1155
Rangi Point Remnants	O06/035	99
Herekino River South Remnants	N05/004	16
Rawhia Remnants	O05/149	38
Otawhiti Bush	O06/012	46
TOTAL		2839.7

Coastal dunes

41% of the Hokianga North Head site (O06/034) is protected including 37 ha of forest. However this does not include the faces visible from the south side of the Hokianga Harbour.

Forest and shrubland

1501.8 ha is protected, including coastal forest. This equates to 1.75% of the total District or 11% of the sites (excluding harbours). Of this, 1020 ha (68%) of the protected forest and shrubland occurs in two sites, Tapuwae Scenic Reserve (O05/097) and Tapuwae Forest & Outliers (O05/115). Tapuwae Scenic Reserve protects 208 ha of mostly (at least 98%) secondary coastal forest and Tapuwae Forest & Outliers contains 812 ha of protected lands (69 %of the site), including old-growth taraire-towai forest, secondary kanuka/manuka-totara forest, and some secondary podocarp forest (kahikatea-totara).

As can be seen from Table 1A (page 247), the majority of vegetation types protected include taraire and towai-taraire forest, secondary kanuka/manuka, totara and towai forest, and kanuka/manuka shrubland, in other words, the most common vegetation types. It is estimated that about 14% of the protected forest and shrubland is secondary podocarp forest, but this figure has not been verified.

TABLE 1A. SUMMARY OF VEGETATION TYPES PROTECTED IN HOKIANGA ECOLOGICAL DISTRICT (areas in ha).

Site	Vegetation protected	Total area protected	Total site area	Estimated area of podocarp forest
Eaton Rd Bush O05/009A	Taraire-towai forest, fernland, kanuka & towai shrubland.	15	67	
Mangakotukutuku Stream Forest O05/016	Kanuka, manuka & towai shrubland. Secondary taraire-towai forest, kahikatea-taraire, kanuka-totara and kahikatea forest.	94	155	5
Waiotehue Reserve O05/019	Secondary taraire, kahikatea, kahikatea-towai, kanuka/manuka-kauri forest; some manuka shrubland?	11	12	9
Pearce Block Remnants O05/020	Taraire-towai forest and towai-kanuka forest.	13.8	41	
Wiseman Block O05/022	Taraire-towai forest, secondary kahikatea forest and raupo reedland.	31.4	61	5
Upper Uwhiroa Catchment Remnants O05/023	Northern rata-taraire forest, taraire forest, manuka-totara-towai forest, manuka and totara shrubland.	54	54	
Otaneroa Scenic Reserve O05/025	Taraire forest.	2	10	
Waiotehue Stream Bush O05/026	Taraire treeland and secondary totara forest.	4	11	7
Dysart/Powell Rd Bush O05/032	Quarry reserve - manuka shrubland.	1	144	
Upper Herekino River Remnants O05/033	Wetland.	2	81	
Rotokakahi River & Surrounds O05/052	Secondary kanuka and kanuka-totara-towai forest, taraire forest, mixed podocarp broadleaf forest with rimu element.	47	250	5
Pareokawa Bush O05/054	Taraire and taraire-towai forest.	69	132	
Mangonuiowae Bush O05/055	Taraire forest, taraire-towai forest.	124	322	
Broadwood Riparian Remnants O05/061	Taraire forest.	9	25	
Mansbridge Scenic Reserve O05/063	Taraire forest.	1	1	
Landcorp Paponga Remnants O05/067	Taraire forest.	9	119	
Runaruna Scenic Reserve O05/073	Mostly kanuka/manuka shrubland.	8	44	
Wharekauere Bush Remnants O05/087	Manuka shrubland.	1	265	
Tapuwae Scenic Reserve O05/097	Secondary coastal forest.	208	406	
Tapuwae Forest & Outliers O05/115	Taraire-towai forest, secondary kanuka/manuka-totara forest, and some secondary podocarp forest (kahikatea-totara).	812	1174	165
Te Tio Rd Bush O05/123	Puriri-tanekaha-taraire-totara coastal forest, kanuka forest.	4.8	40.5	
Rawhia Remnants O05/149	Kanuka/manuka coastal forest.	2	18	
Hautau Stream Remnant O05/151	<i>Coprosma propinqua</i> swamp shrubland.	2	55	
Hokianga Harbour O05/152	See discussion above.	149	11065	
Reena Bush O05/156	Kanuka/manuka forest.	3	165	
Opara Rd QEII Remnant O05/157	Manuka-tanekaha coastal forest.	10	19	10
Waoku Rd Bush O06/003	Kahikatea-pukatea-taraire forest.	2	175	
Koutu Shrubland O06/011	Manuka shrubland.	1	5	
Hokianga North Head Coastal Associations O06/034	Sandfield, coastal forest.	484	1155	
Rangi Point Remnants O06/035	Kanuka/manuka shrubland.	1	99	
Taumatawhauwhau Forest Outlier P06/023 Forest.		5	262	
TOTAL		2180	16432.5	206

5.2 PRIORITY NATURAL AREAS FOR PROTECTION IN THIS ECOLOGICAL DISTRICT

1. **Sites adjoining the coast or harbours, including coastal wetlands, freshwater wetlands and coastal forest and shrubland**, especially where sequences occur and areas joining the Tapuwae and Motuti Rivers, including: Upper Herekino River (O05/033) – site partly protected (2.4%), Kohe Stream Remnants (O05/046), Haumanga Rd Wetland (O05/049), Wharekauere Bush Remnants (O05/087), Te Karaka Point Coastal Forest (O05/089), Motuti Coastal Remnants (O05/091), Hautau Stream Remnant (O05/151) – partly protected (3.5%), Classens/Duddys Bush (O06/004), Wheoki Stream/Pukemaire Remnants (O06/009), Rangi Point Remnants (O06/035) – partly protected (1%), Hokianga North Head Coastal Associations (O06/034) – partly protected (41%).

Exclusion of stock from the Hokianga Harbour is a very high priority.

2. **Podocarp, broadleaf and broadleaf–podocarp forest on alluvium**, including:

Kahikatea–ti kouka swamp forest on alluvium at Lower Waihou Swamp & Shrubland (O05/090)

Kahikatea forest on alluvial terrace and Rimu forest on alluvial terrace at Motuti Coastal Remnants (O05/091)

Pukatea–taraire–towai forest on alluvium at Waiwhakaruru Bush (O05/146)

Waoku Rd Bush (O06/003) contains one of the best lowland alluvial podocarp dominant forests in the District including kahikatea secondary forest on alluvial terrace – site partly protected (1%)

Kahikatea forest (old growth) on alluvium at Upokowhau Forest Remnant (O06/006)

Kahikatea–pukatea forest on alluvium and kahikatea forest on alluvium at Araiwhenua Stream Swamp Forest Remnants (P06/016)

Kahikatea forest on alluvium at Amazon Rd Forest (P06/027).

3. **Sites adjoining the Waipoua–Waima–Mataraua Forest tract and Warawara Forest**, including:

Warawara Forest

Reena Bush (O05/156) – partly protected (1.8%)

Waipoua–Waima–Mataraua Forest

Northern Mataraua Forest (O06/002), Waoku Rd Bush (O06/003), Mangatawa Bush (P06/022), Taumatawhauwhau Forest Outlier (P06/023) – partly protected (1.9%).

4. **Freshwater wetlands**, including:

Lower Waihou Swamp & Shrubland (O05/090) is one of the largest mineral freshwater wetlands in the Ecological District, Te Hurunga Forest (wetland and catchment) (O06/010), Whawharu Swamp (O06/033), Ninihi Rd Swamp & Catchment (P06/020).

5. Corridors between Raetia (Maungataniwha Ecological District) and Herekino Forests (Ahipara Ecological District), including:

Mangakotukutuku Stream Forest (O05/016) – partly protected (60.6%), Otaneroa Stream Remnants (O05/018), Wiseman Block (O05/022), (Tongaroa Stream Remnant (O05/030) (contiguous with Herekino Forest).

6. Habitats containing ecological units that are uncommon in the Ecological District and which do not fall into any of the above categories, including:

Runaruna Mud Volcano (O05/154) is the only mud volcano in Northland.

Kowhai–puriri–totara forest on toeslope, a lowland forest type once common in the Ecological District but now virtually absent, is recorded at Wairupe Forest Remnant (O05/111).

Ecological units with kauri as a component have only been recorded in three sites within the Ecological District: Taumatawhauwhau Forest Outlier (P06/023) contains unmodified kauri (emergent)–rewarewa–taraire forest (the extent of which is unknown, further survey required) – site partly protected (1.9%); manuka–kauri forest makes up a significant area (survey records around 195 ha of this type) of the Te Hurunga Forest (O06/010); and Waiotehue Reserve (O05/019), which contains kanuka/manuka–kauri forest (this site is 91% protected).

TABLE 2. ECOLOGICAL UNITS RECORDED IN THE HOKIANGA ECOLOGICAL DISTRICT AND PROTECTED STATUS.

Key: * = Level 2 site; **Bold pna numbers** = representative ecological units; part of = part of site is within geological description;
 pt = site is partially protected, but unknown whether ecological unit falls within the protected area, CC = Conservation Covenant;
 QEII = Queen Elizabeth II National Trust Open Space Covenant; RR = Recreation Reserve; SL = Stewardship Land; SR = Scenic Reserve;
 GP = Government Purpose Reserve; MS = Marginal Strip.

	Drowned river valley	Alluvium	Otaua Group sandstone	Mangakahia Complex sandstone	Waipoua basalt	Mangakahia Complex (siliceous) mudstone
WETLANDS						
<i>Baumea articulata</i> -kikuyu				O05/091(part of)		
<i>Baumea rubiginosa</i>				O05/091 (part of)		
constructed pond				*O05/021(part of) *O05/050 *O05/068		*O05/021(part of) *O05/150 *O05/153
constructed wetland				*O05/027		
<i>Coprosma propinqua</i>		O05/124		O05/091 (part of)		
harakeke- <i>Coprosma propinqua</i> - manuka-ti kouka		O05/128				
harakeke-raupo				*O05/068		
harakeke-raupo-ti kouka		O06/008				
kanuka/manuka-ti kouka		O05/120 (part of)		O05/120 (part of)		
manuka-raupo		O05/033 (ptMS)				
raupo		O05/071(part of) O05/090 (part of) O05/099 O06/033	O06/010 (part of) P06/020	O05/022 (ptCC) O05/052(ptSR) O05/071(part of) O05/090 (part of) O05/091(part of) O05/122 O06/032 *O05/021(part of) *O05/050		O05/090 (part of) O06/010 (part of) O06/035 (part of,ptSL) *O05/021(part of)
raupo-harakeke		O05/124				
ESTUARINE & ASSOCIATED WETLANDS						
bachelor's button- <i>Isolepis cernua</i> -sea primrose- <i>Selliera radicans</i> herbfield	O05/152 (ptMS,SL)					
<i>Coprosma propinqua</i>	O05/152 (ptMS,SL)	O05/151 (part of,ptSL)				O05/151 (part of,ptSL)

	Holocene alluvium/ estuarine	Eroded muddy limestone peak	Motatau Complex muddy limestone	Akarua Supergroup conglom- erate	Pleistocene eroded consolidated dunes	Tangihua Complex
WETLANDS						
Baumea articulata-kikuyu	O05/091(part of)					
Baumea rubiginosa	O05/091(part of)					
constructed pond						
constructed wetland						
Coprosma propinqua	O05/091(part of)					
harakeke-Coprosma propinqua- manuka-ti kouka						
harakeke-raupo						
harakeke-raupo-ti kouka						
kanuka/manuka-ti kouka						
manuka-raupo						
raupo	O05/091(part of) O06/010(part of)		O06/035(part of,ptSL)			
raupo-harakeke						
ESTUARINE & ASSOCIATED WETLANDS						
bachelor's button-Isolepis cernua-sea primrose- Selliera radicans herbfield						
Coprosma propinqua						

	Drowned river valley	Alluvium	Otaua Group sandstone	Mangakahia Complex sandstone	Waipoua basalt	Mangakahia Complex (siliceous) mudstone
ESTUARINE AND ASSOCIATED WETLANDS (<i>continued</i>)						
<i>Coprosma propinqua</i> -manuka-ti kouka		O05/151 (part of,ptSL)				O05/151 (part of,ptSL)
giant umbrella sedge-raupo		O05/033 (ptMS) O05/049 (part of)		O05/049 (part of)		
harakeke- <i>Juncus</i> sp.		O05/033 (ptMS)				
harakeke-saltmarsh ribbonwood		O05/033 (ptMS)				
<i>Juncus</i> sp.-oioi	O05/143					
mangrove	N05/041 O05/143 O05/152 (ptMS,SL)					O06/035 (part of,ptSL)
mangrove-sea rush	O05/152 (ptMS,SL)					
manuka		O05/033 (ptMS) O05/049 (part of)		O05/049 (part of)		
manuka-saltmarsh ribbonwood		O05/033 (ptMS)				
marsh clubrush	O05/152 (ptMS,SL)					
mud and sandflats	O05/152 (ptMS,SL)					
oioi	O05/152 (ptMS,SL)			O06/004		
oioi-raupo-saltmarsh ribbonwood-sea rush	O05/152 (ptMS,SL)					
oioi-saltmarsh ribbonwood		O05/151 (part of,ptSL)				O05/151 (part of,ptSL)
oioi-sea rush	N05/041 O05/143 O05/152 (ptMS,SL)					
<i>Paspalum vaginatum</i>	O05/152 (ptMS,SL)					
raupo		O05/033 (ptMS) O05/049 (part of)		O05/049 (part of) O06/004		
raupo- <i>Juncus</i> sp.				O05/046		
raupo-sea rush	O05/143					
rock platforms	O05/152 (ptMS,SL)					

	Holocene alluvium/ estuarine	Eroded muddy limestone peak	Motatau Complex muddy limestone	Akarua Supergroup conglom- erate	Pleistocene eroded consolidated dunes	Tangihua Complex
ESTUARINE AND ASSOCIATED WETLANDS (continued)						
<i>Coprosma propinqua</i> - manuka-ti kouka						
giant umbrella sedge-raupo						
harakeke- <i>Juncus</i> sp.						
harakeke-saltmarsh ribbonwood						
<i>Juncus</i> sp.-oioi						
mangrove						
mangrove-sea rush						
manuka						
manuka-saltmarsh ribbonwood						
marsh clubrush						
mud and sandflats						
oioi						
oioi-raupo-saltmarsh ribbonwood-sea rush						
oioi-saltmarsh ribbonwood						
oioi-sea rush						
<i>Paspalum vaginatum</i>						
raupo						
raupo- <i>Juncus</i> sp.						
raupo-sea rush						
rock platforms						

	Drowned river valley	Alluvium	Otaua Group sandstone	Mangakahia Complex sandstone	Waipoua basalt	Mangakahia Complex (siliceous) mudstone
ESTUARINE AND ASSOCIATED WETLANDS (<i>continued</i>)						
sea rush	N05/041 O05/143 O05/152(ptMS,SL)					
sea rush-mangrove	O05/143 O05/152(ptMS,SL)					
<i>Spartina alterniflora</i>	O05/152(ptMS,SL)					
COASTAL ASSOCIATIONS/SANDFIELDS						
exotic pasture grass- native grass-rush						
lupin- <i>Spinifex</i>						
sandfield						
<i>Spinifex</i>						
FERNLAND						
bracken-ring fern				O05/009A(ptCC)		
SHRUBLAND						
bracken-mahoe				O05/125(part of)		O05/125(part of)
<i>Coprosma propinqua</i> - manuka-totara		O05/049(part of)		O05/049(part of)		
kanuka		O05/025 (part of,ptSR) *O05/074B (part of)		O05/016(ptCC) O05/025 (part of,ptSR) O05/052(ptSR) O05/009A(ptCC) *O05/074B(part of)		
kanuka/manuka		O05/049(part of) O05/071(part of) O05/090(part of) O05/120(part of)		O05/032(ptSL) O05/035 O05/048 O05/049(part of) O05/056 O05/071(part of) O05/090(part of) O05/096(part of) O05/114 O05/116(part of) O05/117		O05/090(part of) O05/116(part of) *O05/150

	Holocene alluvium/ estuarine	Eroded muddy limestone peak	Motatau Complex muddy limestone	Akarua Supergroup conglom- erate	Pleistocene eroded consolidated dunes	Tangihua Complex
ESTUARINE AND ASSOCIATED WETLANDS (continued)						
sea rush						
sea rush-mangrove						
<i>Spartina alterniflora</i>						
COASTAL ASSOCIATIONS/SANDFIELDS						
exotic pasture grass- native grass-rush		O06/034 (part of,ptMS,SL)			O06/034 (part of,ptMS,SL)	
lupin- <i>Spinifex</i>		O06/034(part of,ptMS,SL)			O06/034(part of,ptMS,SL)	
sandfield		O06/034 (part of,ptMS,SL)			O06/034 (part of,ptMS,SL)	
<i>Spinifex</i>		O06/034 (part of,ptMS,SL)			O06/034 (part of,ptMS,SL)	
FERNLAND						
bracken-ring fern						
SHRUBLAND						
bracken-mahoe						
<i>Coprosma propinqua</i> - manuka-totara						
kanuka						
kanuka/manuka				O05/096 (part of)		

	Drowned river valley	Alluvium	Otaua Group sandstone	Mangakahia Complex sandstone	Waipoua basalt	Mangakahia Complex (siliceous) mudstone
SHRUBLAND (<i>continued</i>)						
kanuka/manuka (<i>continued</i>)				O05/118 O05/119 O05/120(part of) O05/122 *O05/027 *O05/028 *O05/031 *O05/073(ptSR)		
kanuka/manuka-ring fern				O05/024		
kanuka-towai				O05/024		
mamaku-manuka		O05/033 (ptMS)				
manuka		O05/060(part of) O05/071(part of) O06/003 (part of,ptMS) P06/022 (part of)	O06/010(part of) P06/023 (part of,ptCC)	O05/016(ptCC) O05/023 O05/024 O05/030(part of) O05/032(ptSL) O05/035 O05/037 *O05/043 O05/045 O05/052(ptSR) O05/055 (pt GP,SL) O05/056 O05/060(part of) O05/067(ptSL) O05/071(part of) O06/002 O06/003 (part of,ptMS) O06/004 P06/022 (part of) *O05/031 *O05/038 *O05/039 *O05/042 *O05/043 *O05/044 *O05/073(ptSR) *O05/074A	P06/023 (part of, ptCC)	O05/019(ptSL) O06/003 (part of,ptMS) O06/010(part of)
manuka-bracken				*O05/021(part of)		*O05/021 (pt of)
manuka-totara				O05/023(QEII) *O05/028 *O05/067(ptSL)		
manuka-towai		O05/059 (part of)		O05/054(ptSR) O05/059 (part of) O05/067(ptSL) *O05/038		O05/059 (pt of)

	Holocene alluvium/ estuarine	Eroded muddy limestone peak	Motatau Complex muddy limestone	Akarua Supergroup conglom- erate	Pleistocene eroded consolidated dunes	Tangihua Complex
SHRUBLAND (continued)						
kanuka/manuka (continued)						
kanuka/manuka-ring fern						
kanuka-towai						
mamaku-manuka						
manuka	O06/010(part of)					O05/030(part of)

	Drowned river valley	Alluvium	Otaua Group sandstone	Mangakahia Complex sandstone	Waipoua basalt	Mangakahia Complex (siliceous) mudstone
SHRUBLAND (continued)						
towai				O05/009A(ptCC) O05/023 (QEII) O05/024		
towai-kanuka/manuka				O05/016(ptCC)		
BROADLEAF FOREST						
kanuka		O05/049 (part of)		O05/018(part of) O05/049 (part of) O05/052 (ptSR) O05/114		O05/018(part of)
kanuka-towai				O05/020 (ptCC) O06/004		
kanuka/manuka				O05/115 (part of, ptSL,SR) *O05/095 *O05/100		O05/115 (part of, ptSL,SR)
kanuka/manuka-towai		O05/071(part of)		O05/071(part of) O05/117		
manuka			P06/020	O05/046 O05/045		
nikau-puriri-taraire				*O05/031		
nikau-puriri-towai				O05/115 (part of, ptSL,SR)		O05/115 (part of, ptSL,SR)
northern rata-taraire				O05/023 (QEII)		
pukatea-taraire-towai				O05/146 O06/002		
puriri-taraire		O05/059(part of)	O06/010 (part of)	O05/048 O05/059(part of) O05/119 O05/114		O05/059(part of) O06/010 (part of)
puriri-taraire-towai		O05/090 (part of)		O05/090 (part of) O05/116 (part of) *O05/126		O05/090 (part of) O05/116 (part of)
swamp maire				O06/032		
taraire		O05/025 (part of,ptSR) O05/049(part of) O05/060 (part of)	P06/023 (part of,ptCC)	O05/018(part of) O05/020 (ptCC) O05/023(QEII) O05/024	P06/023 (part of,ptCC)	O05/018(part of) O05/019 (ptSL) O05/116 (part of) *O05/047(part of)

	Holocene alluvium/ estuarine	Eroded muddy limestone peak	Motatau Complex muddy limestone	Akarua Supergroup conglom- erate	Pleistocene eroded consolidated dunes	Tangihua Complex
SHRUBLAND (continued)						
towai						
towai-kanuka/manuka						
BROADLEAF FOREST						
kanuka						
kanuka-towai						
kanuka/manuka					O05/156(ptCC)	
kanuka/manuka-towai						
manuka						
nikau-puriri-taraire						
nikau-puriri-towai						
northern rata-taraire						
pukatea-taraire-towai						
puriri-taraire		O06/010(part of)				
puriri-taraire-towai						
swamp maire						
taraire					O05/030(part of)	

	Drowned river valley	Alluvium	Otaua Group sandstone	Mangakahia Complex sandstone	Waipoua basalt	Mangakahia Complex (siliceous) mudstone
BROADLEAF FOREST (<i>continued</i>)						
taraire (<i>continued</i>)		O05/061 (part of,ptMS,SR) O05/071 (part of) *O05/026(part of) *O05/063(part of,SR)* O05/074B(part of)		O05/025 (part of,ptSR) O05/030(part of) O05/032(ptSL) O05/035 O05/045 O05/046 O05/049(part of) O05/052 (ptSR) O05/054 (ptSR) O05/055 (ptGP,SL) O05/056 O05/060 (part of) O05/061 (part of,ptMS,SR) O05/067(ptSL) O05/071 (part of) O05/114 O05/116 (part of) O05/117 O06/004 *O05/026(part of) *O05/031 *O05/038 *O05/043 *O05/044 *O05/047(part of) *O05/051 *O05/057 *O05/063(part of,SR) *O05/070* O05/073(ptSR) *O05/074B(part of)		
taraire-pukatea-puriri				O06/007		
taraire-towai		O05/071(part of) P06/022 (part of)		O05/009A(ptCC) O05/016(ptCC) O05/018(part of) O05/020 (ptCC) O05/022 (ptCC) O05/030 (part of) O05/052(ptSR) O05/054 (ptSR) O05/055 (ptGP,SL) O05/056 O05/066 O05/071(part of) O05/067(ptSL) O05/114 O05/115 (part of, ptSL,SR) O05/118 P06/022 (part of) *O05/095 *O05/100 *O05/121		O05/018(part of) O05/115 (part of, ptSL,SR)

	Holocene alluvium/ estuarine	Eroded muddy limestone peak	Motatau Complex muddy limestone	Akarua Supergroup conglom- erate	Pleistocene eroded consolidated dunes	Tangihua Complex
BROADLEAF FOREST (continued)						
taraire (<i>continued</i>)						
taraire-pukatea-puriri						
taraire-towai						O05/030 (part of)

	Drowned river valley	Alluvium	Otaua Group sandstone	Mangakahia Complex sandstone	Waipoua basalt	Mangakahia Complex (siliceous) mudstone
BROADLEAF FOREST (<i>continued</i>)						
towai				O05/024 O05/030 (part of) O05/035 O05/052(ptSR) O05/118 O06/004 *O05/073(ptSR) *O05/093 *O05/095		
willow		O06/033				
PODOCARP FOREST						
kahikatea		O06/003 (part of, ptMS) O06/006 O05/120(part of) P06/016 P06/027		O05/016(ptCC) O05/018(part of) O05/022 (ptCC) O05/030(part of) O05/045 O05/120(part of) O06/003 (part of, ptMS) O06/007 P06/021 *O05/034 *O05/047(part of)		O05/018(part of) O05/019 (ptSL) O06/003 (part of, ptMS) *O05/047(part of)
kahikatea-totara		O05/071(part of) O05/120 (part of) *O05/074B(part of)		O05/024 O05/032(ptSL) O05/055 (ptGP,SL) O05/071(part of) O05/114 O05/115 (part of, ptSL,SR) O05/120 (part of) *O05/070 *O05/073(ptSR) *O05/074B(part of)		O05/115 (part of, ptSL,SR)
kahikatea-totara				O05/075		
tanekaha-totara				O05/114		
totara		*O05/026(part of) *O05/029 P06/022 (part of)		O05/067(ptSL) O05/119 P06/022 (part of) *O05/026(part of) *O05/029		*O05/150
BROADLEAF-PODOCARP FOREST						
kahikatea-kanuka-puriri				*O05/034		

	Holocene alluvium/ estuarine	Eroded muddy limestone peak	Motatau Complex muddy limestone	Akarua Supergroup conglom- erate	Pleistocene eroded consolidated dunes	Tangihua Complex
BROADLEAF FOREST (continued)						
towai						O05/030 (part of)
willow						
PODOCARP FOREST						
kahikatea						O05/030(part of)
kahikatea-totara						
kahikatea-totara						
tanekaha-totara						
totara						
BROADLEAF-PODOCARP FOREST						
kahikatea-kanuka-puriri						

	Drowned river valley	Alluvium	Otaua Group sandstone	Mangakahia Complex sandstone	Waipoua basalt	Mangakahia Complex (siliceous) mudstone
BROADLEAF-PODOCARP FOREST (<i>continued</i>)						
kahikatea-kanuka-taraire-totara				*O05/147		
kahikatea-kanuka/manuka-totara				O05/115(part of, ptSL,SR)		O05/115(part of, ptSL,SR)
kahikatea-manuka				O05/037		
kahikatea-manuka-totara				O05/055(ptGP,SL)		
kahikatea-nikau-puriri-taraire		O06/006				
kahikatea-pukatea		P06/016				
kahikatea-pukatea-taraire		O06/003 (part of, ptMS)		O06/003 (part of, ptMS)		O06/003 (part of, ptMS)
kahikatea-pukatea-ti kouka		O05/155				
kahikatea-puriri				O05/020 (ptCC)		
kahikatea-puriri-towai				*O05/100		
kahikatea-rewarewa-taraire				O06/004		
kahikatea-taraire		O05/061 (part of,ptMS,SR) O06/033* O05/074B(part of)		O05/016(ptCC) O05/020 (ptCC) O05/023(QEII) O05/035 O05/061 (part of,ptMS,SR) *O05/074B(part of)		
kahikatea-taraire-totara				O05/055 (ptGP,SL) O05/116 (part of)		O05/116 (part of)
kahikatea-ti kouka		O05/090 (part of) O06/033		O06/032 O05/090 (part of)		O05/090 (part of)
kahikatea-totara-towai			P06/020			
kahikatea-towai		O05/061 (part of,ptMS,SR)		O05/061 (part of,ptMS,SR) O06/002		O05/019 (ptSL)
kanuka/manuka-kahikatea				O05/032(ptSL)* O05/034		
kanuka/manuka-tanekaha-towai				O05/116 (part of)		O05/116 (part of)

	Holocene alluvium/ estuarine	Eroded muddy limestone peak	Motatau Complex muddy limestone	Akarua Supergroup conglom- erate	Pleistocene eroded consolidated dunes	Tangihua Complex
BROADLEAF-PODOCARP FOREST (continued)						
kahikatea-kanuka-taraire-totara						
kahikatea-kanuka/manuka-totara						
kahikatea-manuka						
kahikatea-manuka-totara						
kahikatea-nikau-puriri-taraire						
kahikatea-pukatea						
kahikatea-pukatea-taraire						
kahikatea-pukatea-ti kouka						
kahikatea-puriri						
kahikatea-puriri-towai						
kahikatea-rewarewa-taraire						
kahikatea-taraire						
kahikatea-taraire-totara						
kahikatea-ti kouka						
kahikatea-totara-towai						
kahikatea-towai						
kanuka/manuka-kahikatea						
kanuka/manuka-tanekaha-towai						

	Drowned river valley	Alluvium	Otaua Group sandstone	Mangakahia Complex sandstone	Waipoua basalt	Mangakahia Complex (siliceous) mudstone
BROADLEAF–PODOCARP FOREST (<i>continued</i>)						
kanuka/manuka-tanekaha-totara				O05/117 O05/122 *O05/121		
kanuka/manuka-totara				O05/114 O05/115 (part of, ptSL,SR) O05/117 O05/118 O05/119 *O05/093		O05/115 (part of, ptSL,SR)
kanuka-rimu		O05/060(part of)		O05/060(part of)		
kanuka-totara				O05/016(ptCC) O05/056 O05/125 (part of) *O05/051 *O05/073(ptSR)		O05/125 (part of)
kanuka-totara-towai				O05/052(ptSR)		
kowhai-puriri-totara				O05/111		
manuka-totara				O05/045 *O05/043		
manuka-totara-towai		O05/071(part of)		O05/023 (QEII) O05/030(part of) O05/071(part of)		
mixed broadleaf-podocarp				O05/052 (ptSR)		
tanekaha-taraire-towai				O05/096 (part of)		
tanekaha-taraire-totara				O05/122		
taraire-totara				P06/021		
totara-towai				O05/055(ptGP,SL)		
BROADLEAF–KAURI FOREST						
kanuka/manuka-kauri						O05/019 (ptSL)
kauri-rewarewa-taraire			P06/023 (part of,ptCC)		P06/023 (part of,ptCC)	
manuka-kauri			O06/010 (part of)			O06/010 (part of)

	Holocene alluvium/ estuarine	Eroded muddy limestone peak	Motatau Complex muddy limestone	Akarua Supergroup conglom- erate	Pleistocene eroded consolidated dunes	Tangihua Complex
BROADLEAF-PODOCARP FOREST (continued)						
kanuka/manuka-tanekaha-totara						
kanuka/manuka-totara						
kanuka-rimu						
kanuka-totara						
kanuka-totara-towai						
kowhai-puriri-totara						
manuka-totara						
manuka-totara-towai					O05/030(part of)	
mixed broadleaf-podocarp						
tanekaha-taraire-towai				O05/096(part of)		
tanekaha-taraire-totara						
taraire-totara						
totara-towai						
BROADLEAF-KAURI FOREST						
kanuka/manuka-kauri						
kauri-rewarewa-taraire						
manuka-kauri		O06/010(part of)				

	Drowned river valley	Alluvium	Otaua Group sandstone	Mangakahia Complex sandstone	Waipoua basalt	Mangakahia Complex (siliceous) mudstone
COASTAL SHRUBLAND						
kanuka				*N05/004		
kanuka/manuka		O05/151 (part of,ptSL)		O05/094		O05/151 (part of,ptSL)
manuka				O05/037A O05/046 O05/087 (part of,ptMS) O06/009 (part of)		O05/087 (part of,ptMS) *O06/011(ptRR) O06/009 (part of)
manuka-totara				O05/148 (part of)		O05/148 (part of)
COASTAL FOREST						
kahikatea				O05/091 (part of)		
kahikatea-taraire				O06/012		
kahikatea-kowhai-manuka-puriri				O06/009 (part of)		
kahikatea-kowhai-puriri				O05/097 (ptSR)		
kahikatea-tanekaha				O06/009 (part of)		
kanuka				O05/123 (ptSL,QEII)		
kanuka-puriri				*N05/004		
kanuka-tanekaha-totara		O05/151 (part of,ptSL)		O05/089 O05/112 O05/123 (ptSL,QEII)		O05/151 (part of,ptSL)
kanuka/manuka		O05/151 (part of,ptSL)		O05/089 O05/091 (part of) O05/097 (ptSR)	O06/035(part of,ptSL)	O05/149(ptMS) O05/151 (part of,ptSL)
kanuka/manuka-kahikatea				O05/091 (part of)		
kanuka/manuka-kowhai-mamangi					O05/089	
kanuka/manuka-puriri						O05/149 (ptMS)
kanuka/manuka-tanekaha-towai				O05/097 (ptSR)		
kanuka/manuka-totara				O05/098		O05/149(ptMS)
kanuka/manuka-towai						O06/035(part of,ptSL)

	Holocene alluvium/ estuarine	Eroded muddy limestone peak	Motatau Complex muddy limestone	Akarua Supergroup conglom- erate	Pleistocene eroded consolidated dunes	Tangihua Complex
COASTAL SHRUBLAND						
kanuka						
kanuka/manuka						
manuka						
manuka-totara						
COASTAL FOREST						
kahikatea	O05/091(part of)					
kahikatea-taraire						
kahikatea-kowhai-manuka-puriri	O06/009(part of)					
kahikatea-kowhai-puriri						
kahikatea-tanekaha	O06/009(part of)					
kanuka						
kanuka-puriri						
kanuka-tanekaha-totara						
kanuka/manuka	O05/091(part of)	O06/035(part of,ptSL)				
kanuka/manuka-kahikatea	O05/091(part of)					
kanuka/manuka-kowhai-mamangi						
kanuka/manuka-puriri						
kanuka/manuka-tanekaha-towai						
kanuka/manuka-totara						
kanuka/manuka-towai	O06/034(part of,ptMS,SL)		O06/035(part of,ptSL)		O06/034(part of,ptMS,SL)	

	Drowned river valley	Alluvium	Otaua Group sandstone	Mangakahia Complex sandstone	Waipoua basalt	Mangakahia Complex (siliceous) mudstone
COASTAL FOREST <i>(continued)</i>						
karaka-kohekohe-kowhai-puriri						
kowhai-puriri-taraire				O05/094		
mamaku-nikau-ti kouka				O06/009(part of)		
manuka-kahikatea				O05/091(part of) O06/012		
manuka-kauri-mamangi				O06/009(part of)		
manuka-nikau-taraire				O05/087(part of,ptMS)		O05/087(part of,ptMS)
manuka-tanekaha				O05/157(part of,ptQEII)		O05/157(part of,ptQEII)
manuka-tanekaha-taraire				O05/087(part of,ptMS)		O05/087(part of,ptMS)
nikau				O06/009(part of)		
nikau-taraire				O05/091(part of)		
pohutukawa						
puriri-tanekaha-taraire-totara				O05/123(ptSL, QEII)		
puriri-taraire				O06/009(part of)		
puriri-totara				O05/148(part of)		O05/148(part of)
rewarewa-taraire-towai				O05/089		
rimu				O05/091(part of)		
taraire-nikau				O05/087(part of,ptMS)		O05/087(part of,ptMS)
taraire-tanekaha				O06/009(part of)		
towai		O05/151(part of,ptSL)		O05/151(part of,ptSL)		
OTHER						
grass-sedge association		O05/035				

	Holocene alluvium/ estuarine	Eroded muddy limestone peak	Motatau Complex muddy limestone	Akarua Supergroup conglom- erate	Pleistocene eroded consolidated dunes	Tangihua Complex
COASTAL FOREST (<i>continued</i>)						
karaka–kohekohe–kowhai–puriri		O06/034 (part of,ptMS,SL)			O06/034 (part of,ptMS,SL)	
kowhai–puriri–taraire						
mamaku–nikau–ti kouka	O06/009 (part of)					
manuka–kahikatea	O05/091 (part of)					
manuka–kauri–mamangi	O06/009 (part of)					
manuka–nikau–taraire						
manuka–tanekaha						
manuka–tanekaha–taraire						
nikau	O06/009 (part of)					
nikau–taraire	O05/091 (part of)					
pohutukawa		O06/034 (part of,ptMS,SL)			O06/034 (part of,ptMS,SL)	
puriri–tanekaha–taraire–totara						
puriri–taraire	O06/009 (part of)					
puriri–totara						
rewarewa–taraire–towai						
rimu	O05/091 (part of)					
taraire–nikau						
taraire–tanekaha	O06/009 (part of)					
towai						
OTHER						
grass–sedge association						

TABLE 3. SUMMARY OF SITE EVALUATIONS.

(e.u.=ecological unit; reg sign = regionally significant)

LEVEL 1 SITES Survey no.	REPRESENT- ATIVENESS*	RARITY**/SPECIAL FEATURES	DIVERSITY AND PATTERN	NATURALNESS	BUFFER/ LINKAGE/ CORRIDOR	SIZE AND SHAPE
Herekino Harbour N05/041	Rep.site	Estuary.Fauna: 8 threat- ened, 1 reg.sign.	3 e.u.s	High quality	Little riparian vegetation	490 ha
Eaton Rd Bush O05/009A		Fauna: 1 threatened	4 e.u.s	Part regenerating	Adjoins Maungataniwha Forest	67 ha
Mangakotukutuku Stream Forest O05/016		Flora: 1 threatened, 1 reg. sign.Fauna: 3 threatened	7 e.u.s	Mostly regenerating	Contiguous with Raetea Forest	155 ha 3 remnants [†]
Otaneroa Stream Remnants O05/018		Fauna: 3 threatened	5 e.u.s	Regenerating	Corridor between Herekino and Raetea Forests	54.9 ha 3 remnants
Waiotehue Reserve O05/019	Rep.site for 4 e.u.s	Fauna: 3 threatened	5 e.u.s	Strong regeneration	Link between Herekino and Raetea Forests	12 ha
Pearce Block Remnants O05/020	Rep.site for 1 e.u	Flora: 1 threatened. Fauna: 1 threatened	6 e.u.s		Link between Herekino and Raetea Forests	41 ha 3 remnants
Wiseman Block O05/022	Rep.site for 1 e.u	Fauna: 3 threatened	3 e.u.s	Diverse, includes emergents	Link between Herekino and Raetea Forests	61 ha
Upper Uwhiroa Catchment Remnants O05/023	Rep.site for 2 e.u.s	Fauna: 2 threatened	7 e.u.s	Older growth and regenerating	Close to Herekino Forest	54 ha 2 main and 4 small remnants
Central Waiotehue Rd Bush O05/024	Rep.site	Fauna: 1 threatened for 1 e.u	7 e.u.s	Regenerating	Part of a cluster of remnants	51 ha 3 remnants
Otaneroa Scenic Reserve O05/025	Rep.site for 1 e.u	Fauna: 1 threatened	2 e.u.s	Forest dominant	Riparian protection, close to O05/025	10 ha
Tongaroa Stream Remnant O05/030	Rep.site for 2 e.u.s	Fauna: 1 threatened, 1 reg.sign.	6 e.u.s	Emergents present	Contiguous with Herekino Forest	66 ha
Dysart/Powell Rd Bush O05/032		Fauna: 1 threatened	5 e.u.s	Mostly successional	Contiguous with Herekino Forest	144 ha 1 large and 2 small remnants

* Note that most sites have more than one ecological unit present. This column indicates whether or not the site has been selected as being a representative site for one or more ecological units.

** The rapid quantitative method used in this survey did not cover survey for rare species; in most cases species information in this column has been collated from other databases. It is likely that specific species surveys for all sites would reveal additional data on threatened and rare species, and in the case of Level 2 sites, a change in ranking.

[†] Remnants in this column refers to the number of separate areas of habitat within the site.

LEVEL 1 SITES Survey no.	REPRESENT- ATIVENESS	RARITY/SPECIAL FEATURES	DIVERSITY AND PATTERN	NATURALNESS	BUFFER/ LINKAGE/ CORRIDOR	SIZE AND SHAPE
Upper Herekino River O05/033	Rep.site	Fauna: 4 threatened	8 e.u.s Saltwater/ freshwater/ shrubland sequence	High-quality wetland, some weeds in shrubland	Contiguous with Herekino Harbour	81 ha 3 remnants, dissected by the road
Pauanui Bush O05/035	Rep.site for 3 e.u.s	Fauna: 3 threatened	6 e.u.s	Modified, mostly secondary vegetation	Vegetation to Hokianga Harbours edge	280 ha 1 large, 1 medium and 1 small remnant
Ngatauhe Stream Remnants O05/037		Fauna: 1 threatened	2 e.u.s	Fragmented and modified	Catchment protection, Whangape Harbour	139 ha 3 remnants
Rotowhenua River Shrubland O05/037A	Rep.site	Coastal shrubland. Not surveyed [‡]	1 e.u	Part of cluster of habitats	Grades into Whangape Harbour	5 ha
Kohe Bush O05/045	Rep.site for 1 e.u	Fauna: 1 threatened	5 e.u.s	Pockets of good- quality broadleaf- podocarp forest		234 ha 1 large and 1 small remnant
Kohe Stream Remnants O05/046	Rep.site for 2 e.u.s	Coastal riparian. Fauna: 1 threatened	4 e.u.s Forest, wetland	High quality	Contiguous with Whangape Harbour	11 ha 2 remnants
Awaroa River Rd Remnant O05/048		Flora: 1 reg.sign. Fauna: 1 threatened	2 e.u.s	Large shrubland area		86 ha
Haumanga Rd Wetland O05/049	Rep.site for 6 e.u.s	Saltmarsh to terrestrial vegetation. Not surveyed	7 e.u.s Forest, shrub- land, wetland		Contiguous with Whangape Harbour	38 ha 1 main and 2 small remnants
Rotokakahi River Scenic Reserve & Surrounds O05/052	Rep.site for 4 e.u.s	Fauna: 3 threatened	9 e.u.s Forest, shrub- land, wetland	Regenerating, some weeds	Adjoins Rotokakahi River	250 ha
Pareokawa Bush O05/054	Rep.site for 2 e.u.s	Fauna: 1 threatened	3 e.u.s	Emergents	Part of cluster of habitats	132 ha 1 large and 3 small remnants
Mangonuiowae Bush O05/055	Rep.site for 4 e.u.s	Flora: 1 reg.sign. Fauna: 3 threatened	7 e.u.s	Diverse forest	Mangonuiowae River dissects site	322 ha 1 large and 5 small remnants
Waiotehue Rd Bush O05/056		Fauna: 2 threatened	5 e.u.s		Link to O05/054 and O05/055 via pine forest	157 ha 1 main and 1 smaller outlier

[‡] Not surveyed. The Department of Conservation, Northland Conservancy, has not to date (August 2003) specifically surveyed for animal species at this site.

LEVEL 1 SITES Survey no.	REPRESENT- ATIVENESS	RARITY/SPECIAL FEATURES	DIVERSITY AND PATTERN	NATURALNESS	BUFFER/ LINKAGE/ CORRIDOR	SIZE AND SHAPE
Tutaetohia Stream Remnant O05/059	Rep.site for 1 e.u	Fauna: 1 threatened	2 e.u.s	Some emergents	Close to Raetea Forest	25 ha
Pukemiro Remnants O05/060	Rep.site for 1 e.u	Alluvial forest. Fauna: 1 threatened	3 e.u.s		Close to Raetea Forest. Remnant alongside Mangonuiowae Strm	71 ha 2 main and 1 small remnant
Broadwood Riparian Remnants O05/061	Rep.site	Alluvial forest. Fauna: 2 threatened	3 e.u.s	Environmental weed issues, sparse understorey	Remnants alongside Mangonuiowae Strm	25 ha 7 remnants
Ngatieke Airstrip Bush O05/066	Rep.site	Fauna: 2 threatened	1 e.u	Diverse	Close to Raetea Forest	63 ha
Landcorp Paponga Remnants O05/067		Fauna: 1 threatened	5 e.u.s			119 ha 1 large and 3 small remnants
Humphreys Bush O05/071	Rep.site for 1 e.u.s	Fauna: 3 threatened	8 e.u.s Forest, shrub- land, wetland	Large, diverse	Pine forest adjoins	438 ha 2 large and 3 small remnants
Kawaka Stream Remnant O05/075	Rep.site	Podocarp forest. Not surveyed	1 e.u	Secondary forest	Close to Warawara Forest	18 ha
Wharekauere Bush Remnants O05/087	Rep.site	Coastal forest and shrubland. Fauna: 1 threatened	4 e.u.s	Range of successional stages	Vegetation to Hokianga Harbour	265 ha 2 large and 1 small remnant
Te Karaka Point Coastal Forest O05/089	Rep.site	Coastal forest. Fauna: 1 threatened, 1 reg.sign.	4 e.u.s	One of largest and best quality coastal remnants. Stock access, kahili ginger	Vegetation to Hokianga Harbour	60 ha
Lower Waihou Swamp & Shrubland O05/090	Rep.site	Swamp forest. Fauna: 2 threatened	4 e.u.s Forest, shrub- land, wetland	Modified, <i>Gambusia</i> present	Close to Warawara Forest	95 ha 2 remnants, blocks linked by pine
Motuti Coastal Remnants O05/091	Rep.site for 7 e.u.s	Coastal forest, shrubland and alluvial forest. Flora: 1 threatened, 2 reg.sign. Fauna: 2 threatened	10 e.u.s	High quality, diverse	Vegetation sequence down to Hokianga Harbour	203 ha 1 large and 1 smaller remnant
Panguru/Pukepoto Shrublands O05/094	Rep.site	Coastal forest	2 e.u.s	Mostly regenerating	Contiguous with Warawara Forest	125 ha 2 remnants
Matawera Rd Bush O05/096	Rep.site	Fauna: 2 threatened species	2 e.u.s		Remnants linked by pine forest. Close to O05/097	160 ha 1 large and 3 smaller remnants

LEVEL 1 SITES Survey no.	REPRESENT- ATIVENESS	RARITY/SPECIAL FEATURES	DIVERSITY AND PATTERN	NATURALNESS	BUFFER/ LINKAGE/ CORRIDOR	SIZE AND SHAPE
Tapuwae Scenic Reserve O05/097	Rep.site	Coastal forest. Fauna: 4 threatened	3 e.u.s	Large site, reasonably good condition, successional stages	Sequence from hill country to estuarine on Hokianga Harbour	406 ha
Tapuwae River Bush O05/098	Rep.site	Coastal forest. Fauna: 1 threatened	1 e.u		Vegetation sequence down to Hokianga Harbour	78 ha
Tapuwae Wetland O05/099	Rep.site	Rare e.u. Not surveyed	1 e.u	Very small, isolated, stock access	Adjacent to Hokianga Harbour	0.4 ha
Wairupe Forest Remnant O05/111	Rep. site	Lowland forest. Not surveyed	1 e.u	Small, adjacent to road edge		6 ha
Motukaraka Remnant O05/112	Rep.site	Coastal forest	1 e.u	Cutover, otherwise intact	Close to harbour's edge	7 ha
Blue Mountain Rd Bush O05/114	Rep.site for 2 e.u.s	Fauna: 1 threatened	8 e.u.s	Cutover old growth and regenerating forest		187 ha 1 large and 1 small remnant
Tapuwae Forest & Outliers O05/115	Rep.site for 5 e.u.s	Fauna: 2 threatened	6 e.u.s	Diverse including old growth forest	Largest forest north of Hokianga Harbour in ED	1174 ha 2 nd largest forest in ED
Te Karae Stn Remnants O05/116	Rep.site for 4 e.u.s	Flora: 1 reg.sign. Fauna: 2 threatened	5 e.u.s	Southern remnant fenced		22 ha 2 remnants
Maungapohatu Bush O05/117	Rep.site for 2 e.u.s	Flora: 1 reg.sign. Fauna: 3 threatened	5 e.u.s	Regenerating and cutover old-growth forest	Vegetation sequence to Hokianga Harbour edge	321 ha 1 large and 1 small remnant
Pukekohe Stream Bush O05/118	Rep.site for 1 e.u.	Fauna: 2 threatened	4 e.u.s	Fenced with occasional stock access. Cutover and secondary forest, emergents evident	Close link to Tapuwae Forest O05/115	38 ha
Paponga-Mata Rd Association O05/119	Rep.site for 2 e.u.s	Fauna: 3 threatened	4 e.u.s	Cutover and regenerating forest	Close link to Tapuwae Forest O05/115	126 ha 1 large and 1 small remnant
Pahangahanga Remnant O05/120	Rep.site for 1 e.u.	Alluvial forest e.u. and rare swamp shrubland e.u. Fauna: 2 threatened	4 e.u.s	Forest area is unfenced	Part of chain of linking remnants	64 ha
Mata Rd Intersection Remnant O05/122	Rep.site for 2 e.u.	Fauna: 1 threatened	4 e.u.s Forest, shrubland, wetland	Small wetland and secondary vegetation	Part of cluster of remnants	34 ha
Te Tio Rd Bush O05/123	Rep.site	Coastal forest. Fauna: 2 threatened	3 e.u.s	Forested remnant	Forest to harbour's edge	40.5 ha 2 remnants

LEVEL 1 SITES Survey no.	REPRESENT- ATIVENESS	RARITY/SPECIAL FEATURES	DIVERSITY AND PATTERN	NATURALNESS	BUFFER/ LINKAGE/ CORRIDOR	SIZE AND SHAPE
Oraoa Stream Saltmarsh O05/124	Rep.site	Saltmarsh/freshwater wetland.Fauna: 1 threatened	2 e.u.s	Very small. Environ- mental weeds present	Adjacent to Oraoa Stream	1 ha
Umawera Bush O05/125	Rep.site	Fauna: 2 threatened species	2 e.u.s	Partially fenced	Corridor between larger forests	117 ha
Rangiahua Wetland O05/128	Rep.site	Rare swamp association. Not surveyed	1 e.u	Modification since 1994 survey	Contiguous with Waihou River	12 ha
Whangape Harbour O05/143	Rep.site	Harbour Fauna: 5 threatened	5 e.u.s	Little riparian vegetation, large intertidal area		916 ha
Waiwhakaruku Bush O05/146	Rep.site	Alluvial forest. Fauna: 1 threatened	1 e.u	Old-growth forest, environmental weed present		11 ha
Orira River Remnants O05/148	Rep.site for 1 e.u.	Coastal forest and shrubland. Not surveyed	2 e.u.s	Forest understorey mostly grazed out	2 remnants adjoining Hokianga Harbour	88 ha 5 remnants
Rawhia Remnants O05/149	Rep.site for 1 e.u.	Coastal forest. Not surveyed	3 e.u.s		Buffer to Hokianga Harbour	18 ha 2 remnants
Hautau Stream Remnant O05/151	Rep.site	Coastal forest and shrub- land, rare wetland types. Flora: 1 reg.sign. Fauna: 2 threatened	6 e.u.s Forest, shrub- land, wetland		Vegetation sequence down to Hokianga Harbour	55 ha
Hokianga Harbour O05/152	Rep.site for 11 e.u.s	4 th largest harbour in NZ. Flora: 3 threatened, 3 reg. sign. Fauna: 18 threatened, 2 reg.sign.	13 e.u.s	<i>Spartina</i> present in in parts. Stock access common		11 065 ha
Runaruna Mud Volcano O05/154	Rep.site	Nationally important geological site and landform, Northland's only mud volcano. Not surveyed	1 e.u		Isolated	1 ha
Herbert Rd Swamp Forest O05/155	Rep.site	Alluvial forest. Not surveyed	1 e.u	Very small remnant, degraded		2 ha
Reena Bush O05/156	Rep.site	Flora: 1 reg.sign. Fauna: 1 threatened	1 e.u	Largest and best examples of its type in ED	Contiguous with Warawara Forest	165 ha
Opapa Rd QEII Remnant O05/157	Rep.site	Coastal forest. Fauna: 2 threatened	1 e.u		Vegetation to harbour's edge	20.7 ha
Northern Mataraua Forest O06/002	Rep.site for 1 e.u.	Not surveyed	3 e.u.s	Some historical modification, emergents	Contiguous with Waipoua-Waima- Mataraua Forest tract and P06/022	796 ha

LEVEL 1 SITES Survey no.	REPRESENT- ATIVENESS	RARITY/SPECIAL FEATURES	DIVERSITY AND PATTERN	NATURALNESS	BUFFER/ LINKAGE/ CORRIDOR	SIZE AND SHAPE
Waoku Rd Bush O06/003	Rep.site	Alluvial forest e.u.	3 e.u.s		Southern remnant contiguous with Waima Forest, close to O06/002	175 ha 2 remnants
Classens/Duddys Bush O06/004	Rep.site for 6 e.u.s	Saltmarsh e.u. Fauna: 3 threatened, 2 reg.sign. Flora: 1 reg.sign.	7 e.u.s Forest, shrub- land, wetland	Cutover, modified, strong regeneration. <i>Gambusia</i> present	Vegetation sequence to harbour's edge Not contiguous	2130 ha Largest terrestrial habitat in ED 6 remnants
Upokowhawha Forest Remnant O06/006	Rep.site	Alluvial forest e.u. Not surveyed	2 e.u.s	Contains old- growth forest, unfenced	Close to Waima Forest	11 ha
Karangi Bush Remnants O06/007	Rep.site for 1 e.u	Not surveyed	2 e.u.s	Stock access to western remnant, little understorey		39 ha 2 remnants
Vujcich Rd Swamp O06/008	Rep.site	Rare swamp association. Not surveyed	1 e.u	Modified	Isolated	3 ha
Wheoki Stream/Pukemaire Remnants O06/009	Rep.site	Coastal forest and shrubland. Fauna: 1 threatened	8 e.u.s Forest, shrubland	Regenerating	Vegetation sequence to harbour's edge	135 ha 2 large and 2 small remnants
Te Hurunga Forest O06/010	Rep.site for 3 e.u.s	Lowland forest. Flora: 1 (historic) threatened. Fauna: Not surveyed	4 e.u.s Forest, shrub- land, wetland	Significant emergent element	Contiguous with O06/035	470 ha
Otawhiti Bush O06/012		Coastal forest. Fauna: 1 threatened	2 e.u.s		Adjacent to Hokianga Harbour	46 ha 1 main and 1 smaller remnant
Waoku Coach Rd Wetlands O06/032	Rep.site for 1 e.u.	Swamp forest. Fauna: 1 threatened	3 e.u.s Forest, wetland	Artificial ponds	Northern remnant isolated, southern remnant linked to Waima Forest by pine forest	4 ha 2 remnants
Whawharu Swamp O06/033	Rep.site for 3 e.u.s	Swamp forest. Fauna: 1 threatened	4 e.u.s Forest, wetland	High quality/high water table. Some willow	Close to O06/002	11 ha
Hokianga North Head Coastal Associations O06/034	Rep.site for 6 e.u.s	Nationally important geological site and land- form (large area active sand dunes), forest on dunes. Flora: 4 threatened. Fauna: 5 threatened	7 e.u.s Forest, dune- land, shrubland	Weed component	Significant duneland around North Head and along west coast and small duneland area at Kawehitiki Point	1163 ha 2 remnants
Rangi Point Remnants O06/035	Rep.site for 3 e.u.s	Coastal shrubland. Fauna: 1 threatened	4 e.u.s Shrubland, wet- land, estuarine	Vegetation gradients to Hokianga Harbour	Contiguous with O06/010 and harbour	99 ha

LEVEL 1 SITES Survey no.	REPRESENT- ATIVENESS	RARITY/SPECIAL FEATURES	DIVERSITY AND PATTERN	NATURALNESS	BUFFER/ LINKAGE/ CORRIDOR	SIZE AND SHAPE
Araiwhenua Stream Swamp Forest Remnants P06/016	Rep.site	Alluvial forest. Not surveyed	2 e.u.s	Isolated remnants, unfenced, sparse understorey	Riparian	9 ha 2 small remnants
Ninihi Rd Swamp & Catchment P06/020	Rep.site for 2 e.u.s	Not surveyed	3 e.u.s Forest, wetland		Corridor to Kaipeha Swamp (Kaikohe ED)	120 ha
Mangatawa Stream Forest Remnants P06/021	Rep.site	Alluvial forest e.u. Not surveyed	2 e.u.s	Unfenced, some emergents		20 ha 4 small remnants
Mangatawa Bush P06/022	Rep.site	Fauna: 2 threatened	3 e.u.s	Historic modification	Contiguous with Waipoua-Waima- Mataraua Forest tract	433 ha 2 remnants
Taumatawhauwhau Forest Outlier P06/023	Rep.site	Fauna: 1 threatened	3 e.u.s	Contains unmodified forest	Contiguous with Waipoua-Waima- Mataraua Forest tract	262 ha
Amazon Rd Forest P06/027	Rep.site	Alluvial forest. Not surveyed	1 e.u.	One remnant partly fenced	Contiguous with pine forest linking to Waipoua-Waima- Mataraua Forest tract	14 ha 3 small remnants
Total Level 1 sites						25523.5 ha

LEVEL 2 SITES Survey no.	REPRESENT- ATIVENESS	RARITY/SPECIAL FEATURES	DIVERSITY AND PATTERN	NATURALNESS	BUFFER/ LINKAGE/ CORRIDOR	SIZE AND SHAPE
Herekino River South Remnants N05/004		Coastal forest/shrubland. Fauna: 1 threatened	2 e.u.s	Fragmented	Shrubland adjoins Herekino Harbour	16 ha 3 remnants
Upper Mangakotukutuku Stream O05/021		Not surveyed	3 e.u.s	Artificial ponds		2 ha
Waiotihue Stream Bush O05/026		Alluvial treeland. Not surveyed	2 e.u.s	Riparian strip	Riparian along Waitotihue Stream	11 ha
Yuretich Rd Shrubland O05/027		Fauna: 1 threatened (reported)	2 e.u.s	Mostly regenerating		10 ha 4 remnants
"137" Awaroa River Shrubland O05/028		Not surveyed	2 e.u.s		Partial linkage	36 ha
Uwhiroa Stream Remnants O05/029		Alluvial treeland. Not surveyed	2 e.u.s	Small, fragmented	Riparian to Uwhiroa Stream	6 ha 3 remnants
McDonald Rd Bush O05/031		Not surveyed	4 e.u.s	Fragmented. Successional	Partial linkage	24 ha
Smith Rd Forest Remnants O05/034		Not surveyed	3 e.u.s	Small fragmented remnants		13 ha 5 remnants
Stephens Bush O05/038		Flora: 1 reg sign	3 e.u.s	Degraded	Part of cluster of remnants	21 ha
Poutawhera Pa Shrubland O05/039		Not surveyed	1 e.u.	Discontinuous canopy	Catchment protection, Whangape Harbour	26 ha
Pawarenga Rd Shrubland O05/042		Not surveyed	1 e.u.	Successional	Adjacent to Rotokakahi River	19 ha
Tamaho Rd Bush O05/043		Not surveyed	3 e.u.s	Erosion present	Catchment protection, adjacent to Whangape Harbour	45 ha 4 remnants
"165" Kohe Bush O05/044		Not surveyed	3 e.u.s	Regenerating	Catchment protection	25 ha
Candy Bush O05/047		Not surveyed	2 e.u.s	Small fragmented remnants		10 ha 3 remnants
Maire Stream Pond O05/050		Not surveyed	2 e.u.s	Constructed pond		1 ha
Grounds-Haumanga Rd Bush O05/051		Not surveyed	2 e.u.s	Fenced		4 ha
Awaroa Rd Bush O05/057		Not surveyed	1 e.u.	Small		3 ha 2 remnants

LEVEL 2 SITES Survey no.	REPRESENT- ATIVENESS	RARITY/SPECIAL FEATURES	DIVERSITY AND PATTERN	NATURALNESS	BUFFER/ LINKAGE/ CORRIDOR	SIZE AND SHAPE
Mansbridge Scenic Reserve O05/063		Alluvial forest. Not surveyed	1 e.u.	Degraded, environmental weeds present	Close to Raetea Forest	1 ha
Paponga Pond O05/068		Not surveyed	2 e.u.s	Constructed pond		1 ha
Beer Bush O05/070		Not surveyed	2 e.u.s		Part of cluster of remnants	18 ha
Runaruna Scenic Reserve O05/073		Fauna: 2 threatened	6 e.u.s	Grazed	Part of cluster of remnants	42 ha 4 remnants
Runaruna Rd Shrubland O05/074A		Not surveyed	1 e.u	Successional		20 ha
Irvine Rd Bush O05/074B		Not surveyed	4 e.u.s	Diverse but heavily grazed, canopy dis- continuous in areas		112 ha 5 remnants
Panguru Bush Remnant O05/093		Not surveyed	2 e.u.s		Continuous with pine forest	32 ha
Puketawa Rd Bush O05/095		Not surveyed	3 e.u.s		Close to Warawara Forest, pine forest adjoins	65 ha 1 main and 1 small remnant
Mihirau Bush O05/100		Not surveyed	3 e.u.s		Pine forest enclave	24 ha
Te Konoke Bush O05/121			2 e.u.s	Cutover and secondary forest		12 ha
Mudgeway Rd Bush O05/126		Not surveyed	1 e.u.	Good diversity	Close to Omahuta Forest	12 ha
Upper Mangawero Stream Tributary Remnant O05/147		Not surveyed	1 e.u.		Adjacent to pine forests	11 ha
Whakaoma/Huraunui Stream Secondary Forest Remnant O05/150		Not surveyed	2 e.u.s	Small secondary forest		11 ha
Kahikatoa Rd Pond O05/153			1 e.u.	Constructed pond, weed species present		1 ha
Koutu Shrubland O06/011		Coastal. Fauna: 1 threatened	1 e.u.	Small	Adjacent to Hokianga Harbour	5 ha 2 remnants
Total Level 2 sites						639 ha

6. Acknowledgements

We thank the landowners who cooperated with this survey, in particular those who cheerfully provided transport around their properties (and there were many), not to mention cups of tea and other refreshments.

Conservation Department staff Bruce Waddell, Alan Macrae, and Adrian Walker provided valuable assistance from time to time with information and transport during the survey phase of this report.

Special acknowledgement is due to the following members of the team, without whom this report would not have been completed. Peter Anderson was a constantly positive and encouraging team leader and had considerable input into the Introductory section of the Protected Natural Area Programme reports. Geomorphological data was compiled and written by Fred Brook, who also provided valuable scientific advice, guidance and comment.

During the survey phase, Fraser Moors kept the paper, data analysis and map production under control and contributed significantly to the compilation of the glossary. Chrissy Wicks coded the vegetation types for the original draft.

Ray Pierce in particular provided expert advice and assistance with regard to fauna distribution and status. Richard Parrish was also called on for fauna advice and comment. Lisa Forester and Ewen Cameron were frequently called upon for plant identification and botanical advice. Herbarium records from Landcare Research, Lincoln (CHR) and Auckland Museum and Institute (AK) were consulted.

Peter Anderson, Lisa Forester, Ray Pierce, Karen Riddell, and Peter de Lange also provided helpful editorial comment.

Wendy Sporle's knowledge of NI brown kiwi distribution in this Ecological District was invaluable.

Some mapping services in the early stages of this project were carried out by Eric Dutton with financial assistance of the Far North District Council.

Word processor operator Barbara Lyford prepared the original draft and Terry Conaghan and Lorraine Wells prepared the maps and areas for publication using ArcView GIS.

7. Bibliography

Allan, H.H. 1961: Flora of New Zealand. Volume 1. Government Printer, Wellington.

Anderson, P. 1993: A Habitat Protection Strategy for the Northland Conservancy. (Draft) Unpublished report, Department of Conservation, Whangarei.

Arand, J.; Basher, L.; Wardle, R.; Wardle, K. 1993: Inventory of New Zealand soil sites of international, national and regional importance. Part Two - North Island and northern offshore islands. (1st edition) New Zealand Society of Soil Science Occasional Publication 2. Lincoln University.

- Atkinson, I.A.E. 1962: Semi-quantitative measurements of canopy composition as a basis for mapping. *Proceedings New Zealand Ecological Society* 9: 1–8.
- Atkinson, I.A.E. 1985: Derivation of vegetation mapping units for an ecological survey of Tongariro National Park, North Island, New Zealand. *New Zealand Journal of Botany* 23: 361–178.
- Bell, B. 1986: The Conservation Status of New Zealand Wildlife. NZ Wildlife Service, Wellington.
- Brook, F.J. 1996: Classification of the Ecological Districts of Northland. Unpublished Report Department of Conservation, Whangarei.
- Brook, F.J. 2002: Uncommon and rare landsnails in the Northland region of New Zealand, and an assessment of conservation management priorities. Department of Conservation, Whangarei.
- Brownsey, P.; Smith-Dodsworth, J.C. 2000: New Zealand Ferns and Allied Plants. David Bateman, Auckland.
- Chapman, V.A. 1978: Mangroves and saltmarshes of the Herekino, Whangape and Hokianga Harbours. Department of Lands and Survey.
- Conning, L. 2001: Northland Protection Strategy. A Report to the Nature Heritage Fund Committee. Nature Heritage Fund, Wellington.
- Cunningham, A. 1838: Specimen of the Botany of New Zealand. In: Jardine, W.; Selby, P.J.; Johnston, Dr.; Hooker, W.J.; Taylor, R. *Annals of Natural History*. Volumes I - IV. London.
- Davis, A.; Bellingham, M. 1984: Hokianga Harbour Wildlife Survey. Unpublished Report. New Zealand Wildlife Service, Wellington.
- de Lange, P. J.; Heenan, P.B.; Given, D.R.; Norton, D.A.; Ogle, C.C.; Johnson, P.N.; Cameron, E.K. 1999: Threatened and uncommon plants of New Zealand. *New Zealand Journal of Botany*, 37: 603–628.
- Department of Conservation. Internal reports, files and databases. Northland Conservancy, Whangarei.
- Department of Conservation. 1991: An Internal Review of the Protected Natural Areas Programme. Internal unpublished report, Department of Conservation, Wellington.
- Department of Conservation. 1994: Protected Natural Areas Programme Draft Discussion Document. Internal unpublished report, Department of Conservation, Wellington.
- Department of Conservation. 1999: Conservation Management Strategy. Northland Conservancy 1999–2009. Volume one & Volume two. Department of Conservation, Northland Conservancy, Whangarei.
- Druce, A.P. 1992: Indigenous Higher Plants of New Zealand. Unpublished checklist, Landcare Research, Lincoln, New Zealand.
- Evans, R.B. 1993b: Geological Map of Northland Sheets O05, O06 and P06: Rawene, Waipoua and Mangakahia. Published by the author, PO Box 383, Kerikeri.
- Froude, V.A. 1995: Significant Natural Features Gain Protection. *New Zealand Planning Quarterly No. 119*: 20–23.
- Gill, B.; Whitaker, T. 1996: New Zealand Frogs and Reptiles. David Bateman, Auckland.
- Harris, R.J.; Burns B.R. 2000: Beetle assemblages of kahikatea forest fragments in a pasture-dominated landscape. *New Zealand Journal of Ecology* 24: 57–67.
- Harrison, M. 1995: National “Ecosystem” Mapping for Conservation. In: Firms, P.G.; Sutherland, N.C. Proceedings of the 1995 New Zealand Conference on Geographical Information Systems and Spatial Information Research, University of Otago.
- Healy, A. J.; Edgar, E. 1980: Flora of New Zealand. Vol III. Government Printer, Wellington.
- Heather, B.D.; Robertson, H.A. 2000: The Field Guide to the Birds of New Zealand. Penguin Books (NZ) Ltd, Auckland.
- Hitchmough, R. (comp.) 2002: New Zealand Threat Classification System lists 2002. *Threatened species occasional publication* 23. 210 p.

- Kershaw, K.A.; Looney, J.H.H. 1985: Quantitative and Dynamic Ecology. (3rd edn) Edward Arnold, London.
- Kelly, G.C.; Park, G.N. 1986: The New Zealand Protected Areas Programme: a scientific focus. Science Information Publishing Centre, Wellington.
- Kenny, J.A.; Hayward, B.W. 1996: Inventory and maps of important geological sites and landforms in the Northland Region. *Geological Society of New Zealand Miscellaneous Publication 83*.
- King, C.M. 1990: A Handbook of New Zealand Mammals. Oxford University Press, Auckland.
- Lear, R.; Turner, T. 1977: Mangroves of Australia. University of Queensland Press, Brisbane.
- Leathwick, J.R.; Rogers, G.M. 1996: Modelling relationship between environment and canopy composition in secondary vegetation in central North Island, New Zealand. *New Zealand Journal of Ecology 20*: 147–162.
- Lee, Jack. 1987: Hokianga. Hodder and Stoughton, Auckland.
- McEwen, W.M. 1987: Ecological Regions and Districts of New Zealand. *New Zealand Biological Resources Centre Publication 5*.
- Moir, R.W.; Collen, B. Thompson, C.S. 1986: The Climate and Weather of Northland. *New Zealand Meteorological Service miscellaneous publication 115 (2)*. (2nd edn) Ministry of Transport, Wellington.
- Molloy, L. 1988: The Living Mantle. Mallinson Rendel & New Zealand Society of Soil Science, Wellington.
- Molloy, J.; Bell, B.; Clout, M.; de Lange, P.; Gibbs, G.; Given, D.; Norton, D.; Smith, N.; Stephens, T. 2002: Classifying species according to threat of extinction. A system for New Zealand. *Threatened species occasional publication 22*. 26 p.
- Moore, L.B.; Edgar, E. 1970: Flora of New Zealand. Vol II. Government Printer, Wellington.
- Mueller-Dombois, D.; Ellenberg, H. 1974: Aims and Methods of Vegetation Ecology. John Wiley & Sons, New York.
- Myers, S.; Park, G.; Overmars, F. 1987: A Guidebook for the Rapid Ecological Survey of Natural Areas. *New Zealand Biological Resources Centre Publication 6*.
- O'Donnell, C.F.J.; Dilks, P.J. 1987: Preliminary Modelling of Impacts of Logging on Forest Birds in South Westland. *Science and Research Internal Report 1*. Department of Conservation, Wellington.
- O'Donnell, C.F.J. 2001: Advances in New Zealand mammalogy 1990–2000: Long-tailed bat. *Journal of the Royal Society of New Zealand 31*: 43–57.
- Ogle, C. 1982: Wildlife and Wildlife Habitat Values of Northland. *Fauna Survey Unit Report 30*. New Zealand Wildlife Service, Wellington.
- Park, G.N.; Walls, G.Y. 1978: Inventory of Tall Forest Stands on Lowland Plains and Terraces in Nelson and Marlborough Land Districts, New Zealand. Botany Division, Department of Scientific and Industrial Research, Lower Hutt.
- Pierce, R.J.; Atkinson, R.; Smith, E. 1993: Changes in bird numbers in six Northland forests 1979–93. *Notornis 40*: 285–293.
- Pierce, R.J.; Graham, P.J. 1995: Ecology and breeding biology of kukupa (*Hemiphaga novaeseelandiae*) in Northland. *Science and Research Series 91*. Department of Conservation, Wellington.
- Pierce, R.J.; Sporle, W. 1998: Causes of kiwi mortality in Northland. *Conservation Advisory Science Notes 169*. Department of Conservation, Wellington.
- Poole, L.; Adams, N. 1994: Trees and Shrubs of New Zealand. Manaaki Whenua Press, Landcare Research, Lincoln.
- Shaw, W.B. 1994: Botanical Ranking for Nature Conservation. *Science and Research Series 72*. Department of Conservation, Wellington.

- Spurr, E.B.; Warburton, B.; Drew, K.W. 1992: Bird abundance in different-aged stands of rimu (*Dacrydium cupressinum*) – Implications for coupe-logging. *New Zealand Journal of Ecology* 16(2): 109–118.
- Turbott, E.G. 1990: Checklist of the birds of New Zealand and the Ross Dependency, Antarctica, by the Checklist Committee. Ornithological Society of New Zealand, Auckland.
- Warburton, B.; Kingsford, S.J.; Lewitt, D.W.; Spurr, E.B. 1992: Plant species preferences of birds in lowland rimu (*Dacrydium cupressinum*) forest – Implications for selective-logging. *New Zealand Journal of Ecology* 16(2): 119–126.
- Wardle, P. 1991: Vegetation of New Zealand. Cambridge University Press.
- Webb, C.J.; Sykes, W.R.; Garnock-Jones, P.J. 1988: Flora of New Zealand. Vol IV. Botany Division, Department of Science and Industrial Research, Christchurch.
- Williams, G.; Given, R. 1981: The Red Data Book of New Zealand Rare and Endangered Species of Endemic Terrestrial Vertebrates and Vascular Plants of New Zealand. Nature Conservation Council, Wellington.
- Wilson, C.M.; Given, D.R. 1989: Threatened Plants of New Zealand. DSIR Publishing, Wellington.

8. Appendices

8.1 FIELD SURVEY FORM

DEPARTMENT OF CONSERVATION
PROTECTED NATURAL AREAS PROGRAMME

NAME OF HABITAT:..... DATE:

GRID REF.:SSBI NO.: PNA NO.:

HABITAT TYPE(S):

GEOMORPHOLOGICAL TYPE(S):

VEGETATION TYPE(S):

Vegetation Type	% of Total Habitat	Percentage of Cover Value (canopy)			
		Abundant (50-100)	Common (20-50)	Uncommon (5-20)	Rare (0-5)

[illegible]

8.2 LETTER TO RATEPAYERS/ NEWS MEDIA ITEM



Department of Conservation
Te Papa Atawhai

Dear Landowner,

Department of Conservation officers are currently surveying significant natural areas, e.g. bush, wetlands, gumland etc within the Far North District. This has involved mapping natural areas from roadsides or (with the permission of landowners) from other viewpoints, and recording information on their type and condition.

You may well have already talked to staff working in your area. If not, at a later stage departmental staff may ask for permission to enter your land and gather more detailed information on your properties natural areas.

Why are we doing this survey? Northland's natural areas, especially bush pockets, contribute significantly to the character and quality of the region. Many of these areas are habitat for some of our increasingly rare native wildlife.

The Resource Management Act 1991 requires District Councils to consider the natural areas they administer when preparing the District Plan. The information compiled from this survey will be given to the Far North District Council to provide them with a "snapshot" of the distribution and condition of natural areas in the various parts of Northland at a single point in time. The information will be valuable as a reference point for assessing habitat changes over time.

Perhaps the principal value of this survey will be to provide you, the landowners, with information on the significance and makeup of the natural areas that you have preserved on your property so you can better plan the way you wish to manage these areas.

If you have any questions or concerns about the survey process, please contact your local Department of Conservation Field Centre or ring **Peter Anderson, Fraser Moors** or **John Beachman** at our Whangarei Office, telephone (09) 438 0299, fax (09) 438 9886.

If you wish to contact the Far North District Council about this aspect of the District Plan, please phone Peggy Kilberg at the Kaikohe office, telephone (09) 401 2101.

Gerry Rowan
REGIONAL CONSERVATOR



Discussing natural habitats on Geoff Wightman's property at Waimate North are, from left, Department of Conservation officers Fraser Moors and Linda Winch, Far North District Council resource planner Kaylee Wilson, Mr Wightman and DOC officer Nigel Miller.

Natural sites studied in the Far North

Northland's most important natural habitats are being identified in a joint Department of Conservation and Far North District Council project.

Conservation officers have started working on the year-long project, which aims to identify significant habitat areas outside the department's protected land area.

The study is being done for a number of reasons, including the fact that many low-land forests, gumlands, dune-lands, wetlands and sea coasts are under-represented in the existing reserve system.

There is also insufficient information about the location and extent of remnant

areas of native bush, wetlands, dune systems and other areas.

Conservation officers Nigel Miller, Fraser Moors and Linda Winch have begun gathering information by checking DOC's database and then looking at areas from the roadside.

Identification

Once the team has broadly noted the natural features and habitat types which exist in the district, the more important sites will be identified and permission asked from landowners to complete a more indepth survey.

This will provide valuable information for the FNDC's district plan, which is required under the 1991 Re-

source Management Act to consider the environmental values of any proposed activity, and for DOC to advise and assist landowners to voluntarily manage and protect key sites.

It is the first time a Protected Natural Areas programme survey has been done in Northland. The last major Northland survey by the Wildlife Service in 1977-79 did not include observations of vegetation and land-form types.

DOC officer Peter Anderson said that five years later it was found 40 per cent of all surveyed wildlife habitats had been modified in some way or totally lost through land development.

8.3 CATEGORIES OF THREAT

In this report the categories of threat are taken from the New Zealand Threat Classification developed by Molloy et al. (2002). This new system replaces Molloy & Davis (1994), the prioritising system used previously for threatened species work by the Department of Conservation.

Below are Sections 3 and 7, which have been taken from Molloy et al. (2002) to explain the new species classification system.

3. Classification structure and categories

... This section describes each of the categories (shown in Fig. 1).

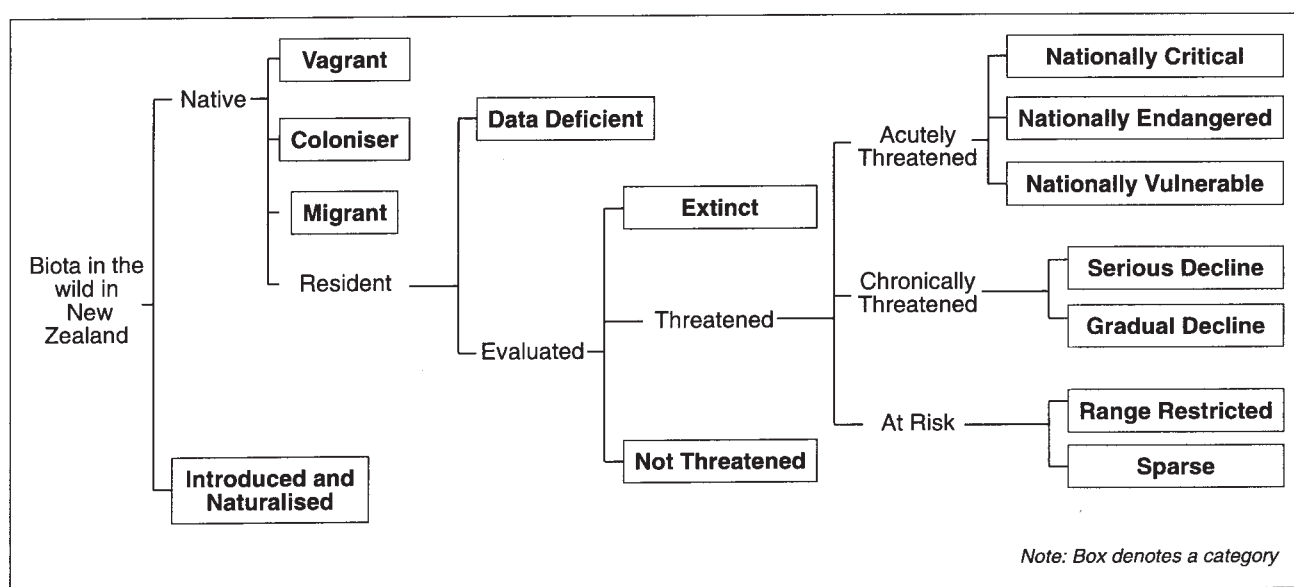


Figure 1. Structure of the New Zealand Threat Classification System.

INTRODUCED AND NATURALISED

Introduced and Naturalised taxa are those that have become naturalised in the wild after being deliberately or accidentally introduced to New Zealand by human agency.

If an Introduced and Naturalised taxon has an IUCN Red Listing in its country (or countries) of origin, the IUCN category and source of the listing are shown after the taxon's name in the New Zealand list. Current examples of this include the cress *Lepidium byssopifolium* and the southern bell frog (*Litoria raniformis*), both of which are listed as Endangered in Australia; and the Parma wallaby (*Macropus parma*), listed as Lower risk/Near threatened.

VAGRANT

For the purposes of this document, vagrants are taxa that are found unexpectedly and rarely in New Zealand, and whose presence in our region is naturally transitory. These are taxa that do not establish themselves beyond their point of arrival because of reproductive failure or for specific ecological reasons (see de Lange & Norton 1998).

Examples include the red-kneed dotterel (*Erythrogonys cinctus*) and the blue moon butterfly (*Hypolimnys bolina nerina*), both from Australia, and the spotted sawtail (*Prionurus maculatus*) from the tropical south-west Pacific Ocean.

If a taxon in the Vagrant category has been listed in an IUCN Red List in its country of origin, the IUCN category and source of the listing are shown beside the taxon's name in the New Zealand list.

COLONISER

Colonisers are taxa that have arrived in New Zealand without direct or indirect help from humans and have been successfully reproducing in the wild for less than 50 years. Three examples are the Nankeen night heron (*Nycticorax caledonicus*), the scoliid wasp *Radumeris tasmaniensis* and the orchid *Cryptostylis subulata*.

The IUCN Red List category and source of the listing is included where this exists.

MIGRANT

Taxa that predictably and cyclically visit New Zealand as part of their normal life cycle, but do not breed here are included in the category Migrant. Examples include the Arctic skua (*Stercorarius parasiticus*) and striped marlin (*Tetrapturus audax*).

In contrast, taxa that either breed here and migrate beyond New Zealand during their life cycle, e.g. Chatham Island albatross (*Thalassarche eremita*), or taxa that are resident in New Zealand for most of their lives, such as longfinned eels (*Anguilla dieffenbachii*), are not included in this category.

The IUCN Red List category and source of the listing is included where this exists.

DATA DEFICIENT

The amount of information available for assessing the threat of extinction is highly variable between taxa and groups of taxa. At one extreme there are taxa such as kakapo, *Gunnerya hamiltonii* and *Tecomantbe speciosa* where every wild individual is known, while at the other extreme there are taxa whose ecology and biology is virtually unknown (e.g. *Koeleria riguorum*, a recently described grass).

Certain criteria and/or definitions must be met for a taxon to be listed in a category. Where information is so lacking that an assessment is not possible, the taxon is assigned to the Data Deficient category. If a taxon is listed in a category other than Data Deficient but confidence in the listing is low due to poor quality data, then the listing can be qualified with the letters DP (Data Poor) to indicate this ...

EXTINCT

A taxon is listed as Extinct when there is no reasonable doubt, after repeated surveys in known or expected habitats at appropriate times (diurnal, seasonal and annual) and throughout the taxon's historic range, that the last individual has died. Examples include huia (*Heteralocha acutirostris*) and Adams's mistletoe (*Trilepidea adamsii*). Only taxa that have become extinct since 1840

are included in the list. Taxa that are extinct in the wild but occur in captivity or cultivation are not listed in this category. These are listed as Critically Endangered and are qualified with the letters EW (Extinct in the Wild).

THREATENED

The threatened categories are grouped into three major divisions: 'Acutely Threatened', 'Chronically Threatened' and 'At Risk'.

Acutely Threatened

The categories in the 'Acutely Threatened' division—Nationally Critical, Nationally Endangered and Nationally Vulnerable—equate with the IUCN categories of Critically Endangered, Endangered and Vulnerable. Taxa in these three categories are facing a very high risk of extinction in the wild, as defined by criteria that quantify:

- Total population size
- Area of occupancy
- Fragmentation of populations
- Declines in total population
- Declines in habitat area
- Predicted declines due to existing threats

Although the criteria (described in Section 6) measure similar population features as those in the IUCN Red List criteria, numerical limits and timeframes are tailored to suit New Zealand circumstances. These were set through a process of testing and refinement by the project team and as a result of feedback from New Zealand species experts. Criteria that attempt to predict declines due to possible future threats are not included because of the highly speculative nature of this type of assessment.

Chronically Threatened

Taxa listed in either of the two categories in the 'Chronically Threatened' grouping (Serious Decline and Gradual Decline) also face extinction, but are buffered slightly by either a large total population, or a slow decline rate (see Section 6).

At Risk

Taxa that do not meet the criteria for Acutely Threatened or Chronically Threatened, but have either restricted ranges or small scattered subpopulations, are listed in one of two categories (Range Restricted and Sparse) that fall under the division 'At Risk'. Although these taxa are not currently in decline, their population characteristics mean a new threat could rapidly deplete their population(s). Range Restricted taxa either occur in a small geographic area (e.g. Three Kings Islands), are restricted to a particular habitat (e.g. geothermal areas), or require very specific substrates (e.g. ultramafic rock), and for colonial breeders, have fewer than 10 subpopulations. Taxa that have naturally restricted ranges and taxa that have become restricted as a result of human activities are both included in this category. This is because both would face the same risk of extinction in the face of a new threat. The two groups are differentiated by the use of a qualifier (see Section 4).

Sparse taxa have very small, widely scattered populations, e.g. New Zealand spinach (*Tetragonia tetragonoides*). As with the Range Restricted category, taxa that are either naturally sparse or have become sparse as a result of human activities are included in this category.

NOT THREATENED

Taxa that are assessed and do not fit any of the Threatened categories are listed in the Not Threatened category.

7. Criteria for the Acutely Threatened and Chronically Threatened categories

... a taxon must meet specific criteria to be listed in one of the Acutely Threatened or Chronically Threatened categories. The criteria for each category are set out below ...

NATIONALLY CRITICAL

Very small population or a very high predicted decline

A taxon is Nationally Critical when available scientific evidence indicates that it meets any of the following three criteria:

1. The total population size is < 250 mature individuals.
2. Human influences have resulted in < 2 sub-populations *and either*:
 - a. < 200 mature individuals in the largest sub-population, *or*
 - b. the total area of occupancy is < 1 ha (0.01 km²).
3. There is a predicted decline of > 80% in the total population in the next 10 years due to existing threats.

NATIONALLY ENDANGERED

A: Small population *and* moderate to high recent or predicted decline

A taxon is Nationally Endangered when available scientific evidence indicates that it fits at least one Status criterion *and* one Trend criterion as follows:

Status criteria

1. The total population size is 250–1000 mature individuals.
2. There are < 5 sub-populations *and either*:
 - a. < 300 mature individuals in the largest sub-population, *or*
 - b. the total area of occupancy is < 10 ha (0.1 km²).

Trend criteria

1. There has been a decline of > 30% in the total population or habitat area in the last 100 years.
2. There is a predicted decline of > 30% in the total population in the next 10 years due to existing threats.

B: Small to moderate population *and* high recent or predicted decline

A taxon is Nationally Endangered when available scientific evidence indicates that it fits at least one Status criterion *and* one Trend criterion:

Status criteria

1. The total population size is 1000–5000 mature individuals.
2. There are < 15 sub-populations *and either*:
 - a. 300–500 mature individuals in the largest sub-population, *or*
 - b. the total area of occupancy is 10–100 ha (0.1–1 km²).

Trend criteria

1. There has been a decline of > 60% in the total population or habitat area in the last 100 years.
2. There is a predicted decline of > 60% in the total population in the next 10 years due to existing threats.

NATIONALLY VULNERABLE

Small to moderate population *and* moderate recent or predicted decline

A taxon is Nationally Vulnerable when scientific evidence indicates that it fits at least one Status criterion *and* one Trend criterion:

Status criteria

1. The total population size is 1000–5000 mature individuals.
2. There are < 15 sub-populations *and either*:
 - a. 300–500 mature individuals in the largest sub-population, *or*
 - b. the total area of occupancy is 10–100 ha (0.1–1 km²).

Trend criteria

1. There has been a decline of 30–60% in the total population or habitat area in the last 100 years and the total population or habitat area is still in decline.
2. There is a predicted decline of 30–60% in the total population in the next 10 years due to existing threats.

SERIOUS DECLINE

A. Moderate to large population *and* moderate to large predicted decline

A taxon is listed in Serious Decline when scientific evidence indicates that it fits at least one Status criterion *and* the Trend criterion:

Status criteria

1. The total population size is > 5000 mature individuals.
2. There are > 15 sub-populations *and either*:
 - a. > 500 mature individuals in the largest sub-population, *or*
 - b. the total area of occupancy is >100 ha (1 km²).

Trend criterion

1. There is a predicted decline of > 30% in the total population in the next 10 years due to existing threats.

B. Small to moderate population *and* small to moderate predicted decline

A taxon is listed in Serious Decline when available scientific evidence indicates that it fits at least one Status criterion *and* the Trend criterion:

Status criteria

1. The total population size is < 5000 mature individuals.
2. There are < 15 sub-populations *and either*:
 - a. < 500 mature individuals in the largest sub-population, *or*
 - b. the total area of occupancy is < 100 ha (1 km²).

Trend criterion

1. There is a predicted decline of 5–30% in the total population in the next 10 years due to existing threats.

GRADUAL DECLINE

Moderate to large population *and* small to moderate decline

A taxon is listed in Gradual Decline when available scientific evidence indicates that it fits at least one Status criterion *and* the Trend criterion:

Status criteria

1. The total population size is > 5000 mature individuals.
2. There are > 15 sub-populations *and either*:
 - a. > 500 mature individuals in the largest sub-population, *or*
 - b. the total area of occupancy is > 100 ha (1 km²).

Trend criterion

1. There is a predicted decline of 5–30% in the total population in the next 10 years due to existing threats, and *the decline is predicted to continue beyond 10 years*.

8.4 CATEGORIES OF IMPORTANCE FOR GEOLOGICAL AND SOIL SITES

Geological sites

Ranking criteria for important geological sites and landforms in the Northland Region follow Kenny & Hayward (1996).

Sites are listed under three levels of importance:

- (a) International – site of international scientific importance.
- (b) National – site of national scientific, educational or aesthetic importance.
- (c) Regional – site of regional scientific, educational or aesthetic importance.

Soil sites

Ranking criteria for New Zealand soil sites of international, national, and regional significance, from Arand et al. (1993).

Soil sites are listed under three levels of importance:

(a) International

- contains the best example of a soil (generally a soil group) or soil-vegetation or soil-landform association that is unique to New Zealand (or these latitudes)
- contains a soil that is naturally uncommon or greatly reduced in extent in other parts of the world
- contains a wide range of extensive soils with a relatively unmodified vegetation cover
- has been studied in detail and is known internationally.

(b) National

- Contains the best or a 'classic' example of a soil (either a soil group or a mapping unit) or a soil-vegetation or a soil-landform association in New Zealand
- contains a soil or soil-vegetation or a soil-landform association that is nationally uncommon or reduced in extent
- contains a moderate range of extensive soils with a relatively unmodified vegetation cover
- has been studied in detail and is known nationally.

(c) Regional

- Contains the best regional example of a soil (generally a mapping unit) or a soil or soil-vegetation or a soil-landform association
- Contains a limited range of soils under vegetation that is relatively unmodified.

8.5 FAUNA

A. Checklist of birds of Northland recorded in the Hokianga Ecological District

Nomenclature follows *Checklist of birds of New Zealand* (Turbott 1990) and *The field guide to the birds of New Zealand* (Heather & Robertson 2000)

Species	Other name	Scientific name	Harbour	Mainland
NI brown kiwi		<i>Apteryx australis mantelli</i>		P
Northern blue penguin	Korora	<i>Eudyptula minor treadalei</i>	P	P
NZ dabchick	Weweia	<i>Poliocephalus rufopectus</i>		P
Black-winged petrel		<i>Pterodroma nigripennis</i>	Record from harbour entrance	
Grey-faced petrel	Oi	<i>P. macroptera gouldi</i>	P	
Australasian gannet	Takapu	<i>Morus serrator serrator</i>	P	
Black shag	Kawau	<i>Phalacrocorax carbo novaebollandiae</i>	P	P
Pied shag	Karuhiruhi	<i>P. v. varius</i>	P	
Little black shag		<i>P. sulcirostris</i>	P	P
Little shag	Kawaupaka	<i>P. melanoleucos brevirostris</i>	P	P
White-faced heron		<i>Ardea novaebollandiae</i>	PL	PL
White heron	Kotuku	<i>Egretta alba modesta</i>	R	
Little egret		<i>E. garzetta nigripes</i>	R	
Reef heron	Matuku moana	<i>E. s. sacra</i>	R	
Cattle egret		<i>Bubulcus ibis coromandus</i>	R (occasional)	P
Australasian bittern	Matuku	<i>Botaurus poiciloptilus</i>	P	P
White ibis		<i>Threskiornis molucca strictipennis</i>	R	
*Black swan		<i>Cygnus atratus</i>	P	P
*Feral goose		<i>Anser anser</i>	R	P
Paradise shelduck	Putangitangi	<i>Tadorna variegata</i>	P	PL
*Mallard		<i>Anas platyrhynchos</i>	PL	PL
Grey duck	Parera, karakahia	<i>A. s. superciliosa</i>	PL	P
Australasian harrier	Kahu	<i>Circus approximans</i>	P	PL
*Californian quail		<i>Callipela californica</i>		PL
*Brown quail		<i>Synoicus ypsilophorus</i>		PL
*Ring-necked pheasant		<i>Phasianus colchicus</i>	P	PL
Royal spoonbill	Kotuku-ngutea	<i>Platalea regia</i>	P	
Banded rail	Moho-pereru	<i>Rallus philippensis assimilis</i>	PL	P
Marsh crake	Koitareke	<i>Porzana pusilla affinis</i>	R	
Spotless crake	Puweto	<i>P. tabuensis plumbea</i>	P	P
Pukeko	Purple swamphen	<i>Porphyrio porphyrio melanotus</i>	PL	PL
SI pied oystercatcher	Torea	<i>Haematopus finschi</i>	P	
Variable oystercatcher	Torea	<i>H. unicolor</i>	R	
Pied stilt	Poaka	<i>Himantopus himantopus leucocephalus</i>	PL	P
Arctic skua		<i>Stercorarius parasiticus</i>	1978 record	
Northern NZ dotterel	Tuturi whatu	<i>Charadrius obscurus aquilonous</i>	R	
Banded dotterel	Tuturiwhatu	<i>C. bicinctus bicinctus</i>	R	
Spur-winged plover	Masked lapwing	<i>Vanellus miles novaebollandiae</i>	PL	PL

Excludes vagrants; * = introduced.

PL = Present in large numbers (>100); P = Present in small numbers (<100); R = Recorded (<10).

Source: Department of Conservation, Northland Conservancy records, Davis & Bellingham (1984).

Species	Other name	Scientific name	Harbour	Mainland
Lesser knot	Huahou	<i>Calidris canutus rogeri</i>	R	
Wrybill	Ngutuparore	<i>Anarhynchus frontalis</i>	R	
Bar-tailed godwit	Kuaka	<i>Limosa l. lapponica</i>	PL	
Black-backed gull	Kararo	<i>Larus d. dominicanus</i>	PL	PL
Red-billed gull	Tarapunga	<i>L. novaebollandiae scopulinus</i>	PL	P
Caspian tern	Taranui	<i>Sterna caspia</i>	P	
White-fronted tern	Tara	<i>S. striata</i>	P	
Little tern	Eastern little tern	<i>S. albifrons sinensis</i>	1978 record	
Kukupā	NZ pigeon, kereru	<i>Hemiphaea n. novaeseelandiae</i>		P
*Eastern rosella		<i>Platycercus eximius</i>	P	P
Shining cuckoo	Pipiharauroa	<i>Corysophus lucidus</i>		PL
Morepork	Ruru	<i>Ninox novaeseelandiae</i>		PL
NZ kingfisher	Kotare	<i>Halcyon sancta vagans</i>	PL	PL
*Skylark		<i>Alauda arvensis</i>		PL
Welcome swallow		<i>Hirundo tabitica neoxena</i>	P	PL
*Dunnock	Hedge sparrow	<i>Prunella modularis</i>		PL
NZ pipit	Pihohoi	<i>Anthus n. novaeseelandiae</i>		P
*Blackbird		<i>Turdus merula</i>	P	PL
*Song thrush	Piopia	<i>T. philomelos</i>		PL
NI fernbird	Matata	<i>Bowdleria punctata vealeae</i>	PL	P
NI fantail	Piwakawaka	<i>Rhipidura fuliginosa placabilis</i>	P	PL
NI tomtit	Miromiro	<i>Petroica macrocephala toitoi</i>		P
Grey warbler	Riroriro	<i>Gerygone igata</i>	P	PL
Silvereye	Tahou, whiteye	<i>Zosterops l. lateralis</i>	P	PL
Tui		<i>Prosthemadera n. novaeseelandiae</i>		PL
*Yellowhammer		<i>Emberiza citrinella</i>	P	PL
*Chaffinch		<i>Fringilla coelebs</i>	P	PL
*Greenfinch		<i>Carduelis chloris</i>		PL
*Goldfinch		<i>C. carduelis</i>		PL
*Redpoll		<i>C. flammea</i>		P
*House sparrow		<i>Passer domesticus</i>	P	PL
*Starling		<i>Sturnus vulgaris</i>		PL
*Common myna		<i>Acridotheres tristis</i>	P	PL
Australian magpie		<i>Gymnobia tibicen</i>		PL

B. Other fauna recorded in the Hokianga Ecological District

Fish		
Short-finned eel	<i>Anguilla australis</i>	
Long-finned eel	<i>A. dieffenbachii</i>	Gradual Decline
Torrentfish	<i>Cheimarrichthys fosteri</i>	
Banded kokopu	<i>Galaxias fasciatus</i>	Regionally significant species
Inanga	<i>G. maculatus</i>	
Common smelt	<i>Retropinna retropinna</i>	
Red-finned bully	<i>Gobiomorphus buttoni</i>	
Common bully	<i>G. cotidianus</i>	
Giant bully	<i>G. gobtoides</i>	Regionally significant species
Cran's bully	<i>G. basalis</i>	
Lizards		
Pacific gecko	<i>Hoplodactylus pacificus</i>	Gradual Decline
Northland green gecko	<i>Nautilinus grayi</i>	Northland endemic – Gradual Decline
Auckland green gecko	<i>N. e. elegans</i>	Gradual Decline
Forest gecko	<i>Hoplodactylus granulatus</i>	Widespread
Shore skink	<i>Oligosoma smithi</i>	Widespread
Invertebrates		
Kauri snail	<i>Paryphanta busbyi</i>	Found throughout
	<i>Pbrixgnathus murdochii</i>	Snail – old record from Rawene
	Punctidae sp. 30 (recorded as Punctidae sp. 155 by Brook (2002))	Snail recorded from Pangaru
Northland tusked weta	<i>Hemiandrus monstrosus</i>	Sparse
Freshwater invertebrates		
Koura, freshwater crayfish	<i>Parenephrops planifrons</i>	
Freshwater shrimp	<i>Paratya curvirostris</i>	
Freshwater mussel	<i>Hydriella menziesi</i>	
Introduced fish		
Catfish	<i>Ameiurus nebulosus</i>	Recorded at Waireia (near site O05/090)
<i>Gambusia</i>	<i>Gambusia affinis</i>	Widespread
Koi carp	<i>Cyprinus carpio</i>	Recorded just outside this District in the Whakanekeneke River which drains into the Waihou River
Introduced mammals		
House mouse	<i>Mus musculus</i>	
Ship rat	<i>Rattus rattus</i>	
Norway rat	<i>R. norvegicus</i>	
Common weasel	<i>Mustela nivalis</i>	
Stoat	<i>M. erminea</i>	
Ferret	<i>M. furo</i>	
Feral cat	<i>Felis catus</i>	
Feral dog	<i>Canis familiaris</i>	
Feral cattle	<i>Bos taurus</i>	
Feral goat	<i>Capra hircus</i>	
Brushtail possum	<i>Trichosurus vulpecula</i>	
Feral pig	<i>Sus scrofa</i>	
European hedgehog	<i>Erinaceus europaeus</i>	
European rabbit	<i>Oryctolagus cuniculus</i>	
Brown hare	<i>Lepus europaeus</i>	

8.6 COMMON AND SCIENTIFIC PLANT NAMES USED IN THE TEXT

This is not a definitive list of common names used for plants from the Ecological District. Rather it is a guide to the reader as to exactly which species is referred to when the common name is used in the text.

Indigenous plants	
black maire	<i>Nestegis cunninghamii</i>
bachelor's button	<i>Cotula coronopifolia</i>
bracken	<i>Pteridium esculentum</i>
filmy ferns	<i>Hymenophyllum</i> sp.
five-finger	<i>Pseudopanax arboreus</i>
giant umbrella sedge	<i>Cyperus ustulatus</i>
glasswort	<i>Salicornia quinqueflora</i>
hangehange	<i>Geniostoma rupestre</i>
harakeke	<i>Phormium tenax</i>
<i>Hebe</i>	<i>Hebe</i> sp.
heketara	<i>Olearia rani</i>
hinau	<i>Elaeocarpus dentatus</i>
hook grass	<i>Uncinia uncinata</i>
houhere	<i>Hoheria populnea</i>
kahikatea	<i>Dacrycarpus dacrydioides</i>
kanuka	<i>Kunzea ericoides</i>
karaka	<i>Corynocarpus laevigatus</i>
karamu	<i>Coprosma robusta</i>
kauri	<i>Agathis australis</i>
kawaka	<i>Libocedrus plumosa</i>
kiekie	<i>Freycinetia banksii</i>
kiokio	<i>Blechnum novae-zelandiae</i>
kohekohe	<i>Dysoxylum spectabile</i>
kohuhu	<i>Pittosporum tenuifolium</i>
koromiko	<i>Hebe stricta</i>
kotukutuku	<i>Fuchsia excorticata</i>
kowhai	<i>Sophora microphylla</i>
lancewood	<i>Pseudopanax crassifolius</i>
large-leafed mahoe	<i>Melicytus macrophyllus</i>
mahoe	<i>M. ramiflorus</i>
maidenhair fern	<i>Adiantum</i> sp.
makamaka	<i>Ackama rosifolia</i>
mamaku	<i>Cyathea medullaris</i>
mamangi	<i>Coprosma arborea</i>
manuka	<i>Leptospermum scoparium</i>
mangrove	<i>Avicennia marina</i>
mapou	<i>Myrsine australis</i>
marsh clubrush	<i>Bolboschoenus fluviatilis</i>
matai	<i>Prumnopitys taxifolia</i>
mingimingi	<i>Leucopogon fasciculatus</i>
miro	<i>Prumnopitys ferruginea</i>
native grass	<i>Optismenus imbecilis</i>
nettle	<i>Urtica incisa</i>
ngaio	<i>Myoporum laetum</i>

Indigenous plants

nikau	<i>Rhopalostylis sapida</i>
northern rata	<i>Metrosideros robusta</i>
oioi	<i>Apodasmia similis</i>
parataniwha	<i>Elatostema rugosum</i>
pate	<i>Schefflera digitata</i>
pigeonwood	<i>Hedycarya arborea</i>
pingao	<i>Desmoschoenus spiralis</i>
pohuehue	<i>Muehlenbeckia complexa</i>
pohutukawa	<i>Metrosideros excelsa</i>
ponga	<i>Cyathea dealbata</i>
puka	<i>Griselinia lucida</i>
pukatea	<i>Laurelia novae-zelandiae</i>
puriri	<i>Vitex lucens</i>
putaputaweta	<i>Carpodetus serratus</i>
rangiora	<i>Brachyglottis repanda</i>
rasp fern	<i>Doodia media</i>
raupo	<i>Typha orientalis</i>
rewarewa	<i>Knightsia excelsa</i>
rimu	<i>Dacrydium cupressinum</i>
ring fern	<i>Paesia scaberula</i>
saltmarsh ribbonwood	<i>Plagianthus divaricatus</i>
sea primrose	<i>Samolus repens</i>
sea rush	<i>Juncus kraussii</i>
shore bindweed	<i>Calystegia soldanella</i>
small-leaved milktree	<i>Streblus heterophyllus</i>
<i>Spinifex</i>	<i>Spinifex sericeus</i>
supplejack	<i>Ripogonum scandens</i>
swamp maire	<i>Syzygium maire</i>
swamp millet	<i>Isachne globosa</i>
tanekaha	<i>Phyllocladus trichomanoides</i>
taraire	<i>Beilschmiedia tarairi</i>
tarata	<i>Pittosporum eugenoides</i>
taurepo	<i>Rhabdotamnus solandri</i>
tawa	<i>Beilschmiedia tawa</i>
tawari	<i>Ixerba brexioides</i>
thread fern	<i>Blechnum filiforme</i>
ti kouka	<i>Cordyline australis</i>
titoki	<i>Alectryon excelsus</i>
toro	<i>Myrsine salicina</i>
toru	<i>Toronia toru</i>
totara	<i>Podocarpus totara</i>
towai	<i>Weinmannia silvicola</i>
tutu	<i>Coriaria arborea</i>
wharangi	<i>Melicope ternata</i>
whau	<i>Entelea arborescens</i>
wheki	<i>Dicksonia squarrosa</i>
white maire	<i>Nestegis lanceolata</i>
white rata vine	<i>Metrosideros perforata</i>
wineberry	<i>Aristotelia serrata</i>

Adventive plants

African club moss	<i>Selaginella kraussiana</i>
apple of Sodom	<i>Solanum linnaeanum</i>
blackberry	<i>Rubus fruticosus</i>
blue pine	<i>Psoralea pinnata</i>
buffalo grass	<i>Stenotaphrum secundatum</i>
crack willow	<i>Salix fragilis</i>
<i>Elaeagnus</i>	<i>Elaeagnus</i> x <i>reflexa</i>
fireweed	<i>Senecio</i> sp.
gorse	<i>Ulex europaeus</i>
honeysuckle	<i>Lonicera japonica</i>
kahili ginger	<i>Hedychium gardnerianum</i>
kikuyu	<i>Pennisetum clandestinum</i>
lantana	<i>Lantana camara</i> var. <i>aculeata</i>
lupin	<i>Lupinus luteus</i>
macrocarpa	<i>Cupressus macrocarpa</i>
Mexican daisy	<i>Erigeron karvinskianus</i>
Mexican devilweed	<i>Ageratina adenophora</i>
mistflower	<i>A. riparia</i>
pampas	<i>Cortaderia selloana</i>
paspalum	<i>Paspalum dilatatum</i>
pine	<i>Pinus radiata</i>
poplar	<i>Populus</i> sp.
prickly hakea	<i>Hakea sericea</i>
thistle	<i>Carduus</i> sp.
tobacco weed	<i>Solanum mauritianum</i>
wattle	<i>Racosperma</i> sp.
wandering willy	<i>Tradescantia fluminensis</i>
wild ginger	<i>Hedychium</i> sp.
willow	<i>Salix babylonica</i> or <i>S. fragilis</i>
willow weed	<i>Polygonum</i> sp.

8.7 GLOSSARY

Biodiversity

The variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems. (IUCN 1993)

Buffer

A zone surrounding a natural area which reduces the effects of external influences on the natural area. For example shrubland, scrub and exotic trees around native forested areas provide a gradation of habitats from fully modified to a natural state. This effect also applies to waterways - riparian vegetation and wetlands protect both water quality and habitat from influences arising from the surrounding land.

Community

An association of populations of plants and animals which occur naturally together in a common environment.

Diversity and Pattern

Diversity is the variety and range of species of biological communities, ecosystems and landforms. Pattern refers to changes in species composition, communities and ecosystems along environmental gradients.

Ecological District

A local part of New Zealand where geological, topographical, climatic and biological features and processes, including the broad cultural pattern, interrelate to produce a characteristic landscape and range of biological communities.

Ecological Region

A group of adjacent Ecological Districts which have diverse but closely related characteristics, or in some cases a single very distinctive Ecological District.

Ecological unit

Vegetation type occurring on a particular landform or soil or rock type.

Ecosystem

Any inter-related and functioning assemblage of plants, animals and substrates (including air, water and soil) on any scale including the processes of energy flow and productivity. (Myers et al. 1987)

Endemic

Occurring naturally in, and restricted to, a particular country, region or locality.

Exotic

Introduced from outside New Zealand.

Fernland

Dominated by ferns such as *Gleichenia*, bracken, tree ferns, with occasional woody plants.

Forest

A tall, predominantly closed canopy consisting mainly of tree species (a tree being a woody plant which attains a 10 cm diameter at breast height - Atkinson 1985).

Much of Northland's forest consists of or includes secondary growth which has developed following disturbance or destruction of the original forest. This may include secondary manuka/kanuka forest where those species have reached tree size and may contain other canopy species.

Flood forest

Forest situated on a floodplain alongside a stream/river and subject to periodic inundation by floodwaters.

It is characterised by species such as ti kouka, kowhai, kahikatea, pukatea, kaikomako, titoki and divaricating shrubs. On drier areas totara, taraire, kohekohe, matai and kanuka may occur. It commonly occurs only as narrow strips due to the deforestation of flat land for pasture.

Habitat

The part of the environment where a plant or animal lives. It includes both the living and non-living features of the area.

Indigenous

Native to and occurring naturally within the New Zealand Biogeographic region.

Landform

A part of the land's surface with distinctive naturally formed physical characteristics e.g. a hill, valley, etc.

Linkages/Corridors

Vegetated or aquatic areas (can be forest, shrubland, wetland, streams, beach or exotic vegetation such as pine) that link up two or more habitats. With a link between habitats the gene pool for a species is greater, which enhances the viability of that population. The corridor does not have to be continuous for many species to utilise it. Small remnants can act as stepping stones between two larger habitats so that birds such as kiwi can move from remnant to remnant up to 500 m apart.

Natural area

A tract of land which supports natural landforms and predominantly native vegetation or provides habitat for indigenous species; identified as a unit for evaluation of ecological quality and representativeness and has potential to be ecologically significant.

Naturalness

The degree to which a habitat is modified and disturbed by human activity or introduced plants and animals and what natural values are retained despite these factors, i.e. to what extent native species are functioning according to natural processes.

Rarity

This is a measure of commonness and may apply to entire ecosystems through to single species. It may refer to the threatened status of a species (see Appendix 8.3) or habitat type in any one of the following ways: formerly common but now rare; rare elsewhere but common in the district; rare in the district but common elsewhere; confined to a limited geographic area; at the limit of its range; or with a contracting or fragmented range.

For example, old-growth alluvial swamp forests are an extremely rare ecosystem type in Northland, and indeed nationally, even though they contain no species which are regarded as rare in themselves.

Reedland

A swampy area dominated by reeds such as raupo, *Eleocharis*, *Glyceria*, harakeke.

Refuge

Native bush enclaves in production pine forest become a refuge for some native species during the logging phase. For example, they allow bird species, such as kiwi, a retreat from logged areas.

Representativeness

The extent to which an area represents or exemplifies the components of the natural diversity of the ecological district. This implies consideration of the full range of natural ecosystems and landscapes that were originally found in the ecological district, how well they are represented in today's environment, and the extent to which they are included in the protected areas network.

Riparian functions

Riparian vegetation performs important functions such as providing corridors linking habitats and providing shading to streams, which is important in Northland, with many streams having small catchments, the water temperature can rise depleting the available oxygen and leading to the death of aquatic life. Litter debris enters into the nutrient cycle with invertebrates like mayfly, caddisfly and stonefly feeding on it. Riparian vegetation acts as a filter for non-point water discharges.

Riparian zone

An area of land immediately adjacent to a watercourse.

Rush/Sedgeland

Swampy areas dominated by rushes, sedges, or rush-like sedges, e.g. *Baumea*, *Juncus* (rush), *Carex*, *Schoenus*, *Isolepis*, marsh clubrush.

Scrub

Refers to seral communities, often dominated by or with a large component of exotic species such as gorse, *Hakea*, tobacco weed, etc. and/or commonly lacking a closed canopy and in which an understorey is either absent or composed primarily of exotic species.

Secondary vegetation

Native vegetation established after destruction or disturbance of the previous vegetation and which is essentially different from the original vegetation. (See Succession, below).

Seral

Describes a plant community in the process of succession.

Shrubland

Vegetation in which the canopy is dominated by woody plants less than 10cm diameter at breast height.

There are 2 main types:

- (i) Successional vegetation dominated by seral species such as manuka, kanuka, mahoe etc or shrubs such as hangehange, bracken, kumerahou.

As used in this report it implies a closed canopy and in more advanced stages contains an understorey of indigenous species.

- (ii) Seral vegetation where the rate of further succession is extremely slow, being limited by abiotic factors such as soil structure and fertility, wind shear, etc., e.g. Gumland manuka shrubland, pohuehue shrubland on dunes.

Site

An area of habitat identified during the rapid field inventory phase of the PNAP.

Its boundaries may be defined by the edge of the habitat (where discrete), catchment or other geographical feature, e.g. river, vegetation type or legal title.

Some small habitats occurring in close geographical proximity, with similar characteristics and functions, have been grouped and addressed as one site, e.g. small broadleaf remnants.

Some large contiguous habitats have been subdivided into separate sites on the basis of catchment or vegetation type, for convenience of administration.

Succession

The process of change in the appearance, composition and structure of a community, usually over a period of time. Change may be due to natural or human-induced factors, or both. For example the colonisation of bare rock, or soil by algae and lichens ending with a stable climax community in equilibrium with the environment. Secondary succession occurs where the original vegetation has been destroyed, e.g. by fire.

Survey no.

The identifier number given to each site. The first three figures refer to the NZMS 260 topographical map sheet that the habitat is on.

Sustainability

The long-term ecological viability of a natural area. This is related to the size and shape of the area as well as to threats from introduced pests.

Swamp

Fertile or eutrophic wetland, usually dominated by raupo, *Carex*, *Baumea articulata*, harakeke and ti kouka.

Swamp forest

A forest type containing water tolerant trees and swamp species such as kahikatea, swamp maire, and pukatea. It may occur on alluvial valley areas but also occurs on poorly drained, semi-level sites within forests at higher altitudes.

Swamp shrubland

A transitional type with woody co-dominants like *Coprosma propinqua*-manuka-ti kouka with putaputaweta, *Coprosma tenuicaulis*, and other divaricating shrubs.

Toeslope

The area at the base of a slope where debris and topsoil have accumulated and often more fertile than higher up the slope.

Vegetation type

Defined by the dominant canopy species and the structure of the vegetation e.g. taraire forest, manuka shrubland

Viability

The ability of an area's natural communities to maintain themselves in the long term in the absence of particular management efforts to achieve this. Regeneration and vigour of species within these communities and stability of communities and processes contribute to viability.

Wetland

An area of land that is permanently or intermittently waterlogged and supports flora and fauna adapted to wet conditions. Wetland is used as a broad definition for several types of aquatic systems, e.g. swamps, bogs and ephemerals.

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