

Heretaunga Ecological District

Survey Report for the Protected Natural Areas Programme



Department of Conservation
Te Papa Atawhai

*Alan Lee
May 1994*

Cover Photograph: View of the small wetland surrounded by podocarp-broadleaved forest cont
within RAP 39 and situated adjacent to the Makaretu River. Photo Alan Lee.

HERETAUNGA ECOLOGICAL DISTRICT

SURVEY REPORT FOR THE PROTECTED NATURAL AREAS PROGRAMME

Alan Lee

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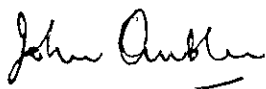
FOREWORD

New Zealand has a protected areas network which is the envy of many nations. On face value it may seem we need not seek protection of additional natural places. That perception is wrong.

The Heretaunga Ecological District is an example of a part of New Zealand where almost all of the original vegetation has been removed, and the landscape converted into pastoral or horticultural uses. Little has been retained for conservation. By contrast, much of the adjoining Ruahine Ecological District has been protected for conservation purposes, in Ruahine Forest Park. So, why do we need to protect more in Heretaunga?

The answer is simple. All ecological districts are ecologically different. To protect a fully representative sample of our natural heritage we must seek to identify and protect sites through an objective and scientifically defensible process.

That is what this survey report achieves. It will be of value to the landowners, to local authorities, to conservation organisations and to the Department. We all share interests in, and responsibility for, the protection of the indigenous biodiversity of New Zealand. In Heretaunga Ecological District we now have a valuable reference to guide us.



J S Ombler
Regional Conservator
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Hawke's Bay

SUMMARY

This report is the result of a survey carried out as part of the Protected Natural Areas Programme (PNAP), a programme aimed at protecting representative examples of a complete range of New Zealand's natural areas and ecological diversity.

The Heretaunga ecological district contains broad plains, river terraces, hill country and coastline, much of which has been modified to the stage that what now remains of the original vegetation of these areas is restricted to small, scattered pockets. In many parts of this district it is possible to travel many kilometres through totally alien vegetation and it is only in the west and north that significant areas of native vegetation still remain, with many of these being confined to land unsuitable for productive use.

A total of 89 areas were visited and surveyed during the course of the field work. Of these, 42 were later selected as Recommended Areas for Protection (RAPs).

These 42 RAPs were selected to complement the existing network of Protected Natural Areas and are recommended as highest priorities for protection. Collectively they exemplify the best of what little is left of the variety of different ecological units originally found on the plains and foothill areas that made up the Heretaunga ecological district. The legal and physical protection of any of these RAPs will result in far better representation of the ecological diversity of this highly modified district.

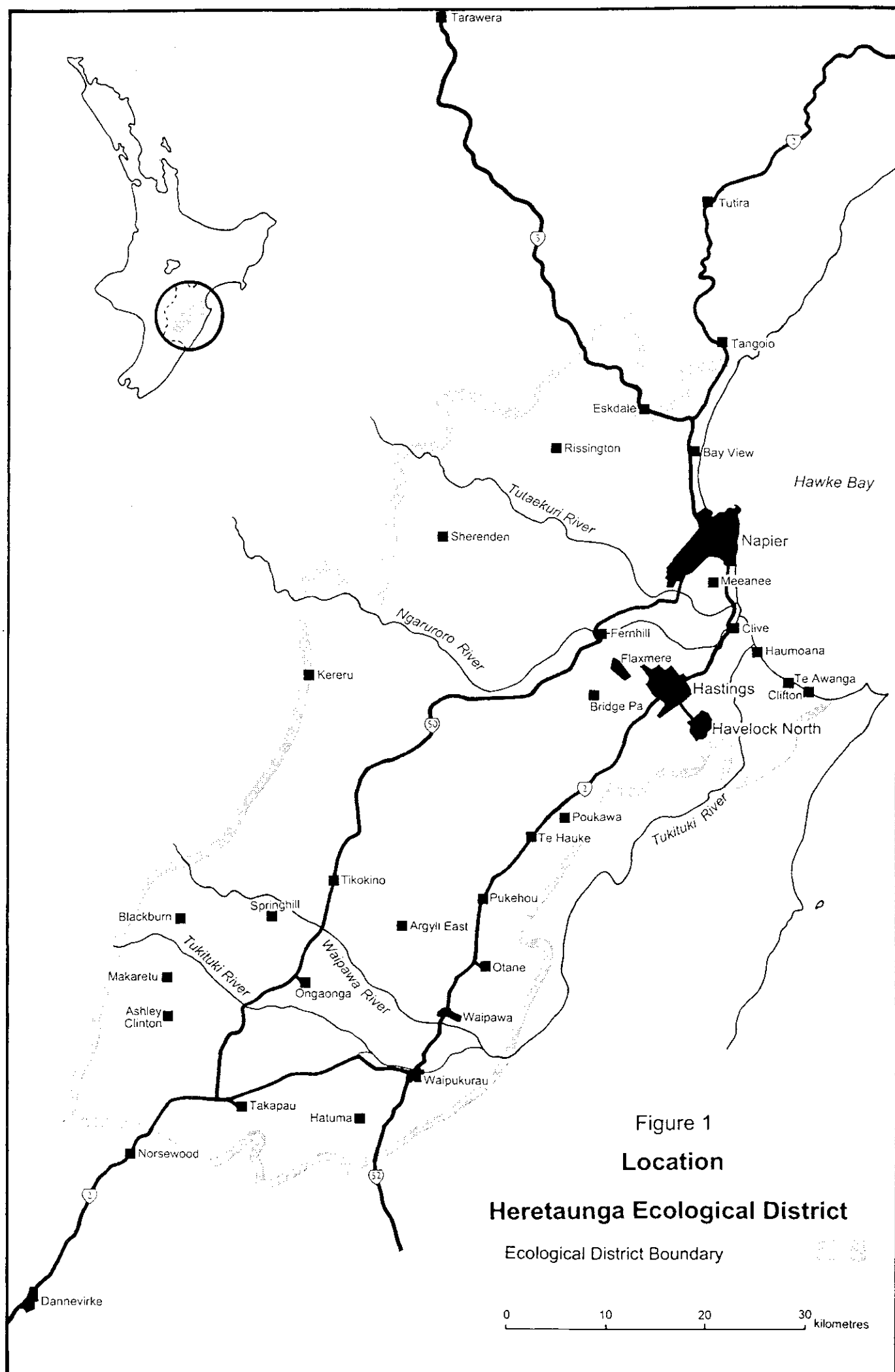


Figure 1
Location

Heretaunga Ecological District

Ecological District Boundary

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INTRODUCTION

The Protected Natural Areas Programme (PNAP) has been established to ensure the protection of a network of areas representative of those natural values giving the New Zealand landscape its own distinctive character. The aim of the programme is to identify areas of natural landscape and vegetation values throughout the 268 ecological districts of New Zealand and, by a process of field survey and evaluation, to select from these a number of Recommended Areas for Protection (RAPs). These RAPs are selected on the basis of their suitability to supplement existing protected natural areas and to give the greatest possible diversity of land form and vegetation pattern, consistent with what was originally present. Once these RAPs have been selected formal protection by various means can then begin to be implemented.

The Heretaunga ecological district is an area of approximately 310,000 ha encompassing much of the lowlands of Hawke's Bay. The Heretaunga ecological district has been identified by the Technical Advisory Group of the Protected Natural Areas Programme as being of urgent priority for survey, based on the adequacy of existing protected natural areas, the extent of knowledge of each region and the threat to remaining unprotected natural areas. Extensive agricultural and horticultural development has extensively modified almost all of this ecological district and it is estimated that only 3% of the land is now covered in native vegetation (Fromont and Walls, 1988).

Much of the natural diversity of this district is not well represented in existing protected natural areas and those that do exist are generally small and scattered. With this in mind the obvious priorities for the future are to add variety and to increase the total area of the existing protected natural areas. Of the 42 RAPs chosen 30 are areas of forest, treeland or scrub, 9 are wetlands and 2 are braided riverbed systems. The other RAP is a small colony of the threatened plant *Muehlenbeckia ephedroides* growing on the coast near Te Awanga.

With the survey, identification and documentation of these RAPs the way is now open to begin formal protection.

ECOLOGICAL CHARACTER OF HERETAUNGA ECOLOGICAL DISTRICT

Landform/Geology

The Heretaunga ecological district is composed mainly of low hills of gentle to moderate topography surrounding the Ruataniwha and Heretaunga plains. Bounded to the west by the Ruahine and Wakarara Ranges and to the east by lower hill country these plains are crossed by several large rivers and their tributaries, all of which flow into the sea close to Napier. Material transported from the rapidly eroding western ranges by these large rivers is responsible for the formation of these extensive plains and high terraces, and for the steep, pebble beaches that characterise almost the entire coastline of this district.

To the northwest of Napier the hill country is steeper and comprises an uplifted, dissected plateau of Pliocene and early Pleistocene sediments. The strata and the plateau surface here dip uniformly at 5° to 10° toward Hawke Bay and the hill tops generally range between 200 and 300 metres in altitude. The predominant rock types of this area are cemented conglomerates and siltstones.

A long northwesterly-dipping ridge of late Pliocene and early Pleistocene age limestone occurs southwest of Hastings as the Raukawa Range, rising to a height of 400 metres above sea level. These limestones are geologically unusual because they are largely composed of barnacle plates and white mollusc shells (Kingma 1971). Barnacle limestones have only rarely been reported from other localities.

Several small, shallow lakes occur within the Heretaunga ecological district, the most significant and largest being Runanga, Oingo, Poukawa and Hatuma. Three large estuaries are located close to Napier: the Ahuriri estuary, the combined Ngaruroro/ Tutaekuri estuary (Waitangi) and the Tukituki estuary.

Soils

Yellow-grey earths are the predominant soil type in the lowland basins of the Heretaunga ecological district. These weakly leached soils occur in areas of less than 875mm/year rainfall and are the more fertile soils.

Yellow-brown earths occur in the more humid parts of the district along the western boundary and closer to the ranges. These soils have a greater variation in fertility owing to parent material differences, vegetation types and rainfall.

Between these two soil types is an intergrade of yellow-grey earths and yellow-brown earths which develop under uniform high rainfall conditions. Compared with yellow-grey earths their topsoils have a more strongly developed granular and nutty structure, their subsoils are darker and more yellow, and their pans are generally softer.

Recent soils from alluvium and gley recent soils are formed in areas where river sediments have been recently deposited. Where accumulation of sediment has been rapid the soils have

only a thin layer of topsoil but a thick, dark granular topsoil is present where deposition has been slower.

Intergrades between yellow-brown loams and yellow-brown earths, organic soils and saline gley recent soils occur to a lesser extent in the ecological district.

Climate

The climate of the Heretaunga ecological district is characterised by warm summer temperatures and mild winters, with high sunshine hours. This applies particularly to the eastern half of the district where annual rainfall is 600-1000 mm/year and summer droughts are common. Rainfall increases and average temperatures decrease further west, and on the western edge of the district the annual rainfall is around 2000 mm/year. Winds are predominantly from the south and west, and are mostly dry foehn winds contributing to the drying effects over the summer months. Frosts may occur during 9 months of the year and while mild near the coast the severity increases with distance inland. Snowfall is rare and snow only occasionally settles on the western parts of the district for brief periods.

Bioclimatic Zones

Within the Heretaunga ecological district four bioclimatic zones have been recognised (Fromont and Walls, 1988). The boundaries of these zones have been decided by the following criteria:

- (i) Coastal zone - A narrow strip up to 5km in width subject to strong maritime influence including exposure to a salt environment and moderation of temperature by the sea's proximity.
- (ii) Lowland arid zone - This zone is subject to extreme growing season moisture deficit and includes the more seaward lowland hill country and plains.
- (iii) Lowland dry zone - The more inland plains and lowland hill country, subject to a lesser growing season moisture deficit.
- (iv) Temperate zone - The inland, higher hill country close to the Wakarara and Ruahine ranges. This zone has a moisture surplus of 0-200 mm/year. The wettest parts of this zone are to the southwest.

Vegetation

The original vegetation cover of the Heretaunga ecological district was vastly different to that which now covers the land. Once virtually all of the Hawkes Bay lowlands supported a cover of forest and shrublands, and extensive areas of low lying swampy ground were found near the coast. To the southwest tall dense forests of totara, matai, rimu and kahikatea covered large areas while further north and east species such as tawa, titoki, maire, ngaio and kowhai would have been more common. In the coastal zone low forest and scrub of ngaio, kanuka, manuka, cabbage trees and tauhinu would have grown. Of this original vegetation cover much was destroyed by the fires of Maori and what was left has been further reduced by the

effects of Pakeha settlement and conversion of forested areas to farmland and exotic plantations.

The landscape today is overwhelmingly dominated by introduced vegetation. Almost all of the Heretaunga ecological district has agriculture or horticulture as the primary land use, with a few small pine plantations in the north and west. With the clearance of bush and conversion to "productive" land an abundance of exotic trees, shrubs and weeds has been planted or has spread by natural means to all parts of the district. Most of the native vegetation that remains is restricted to relatively small and isolated pockets or to riparian strips on steep sided stream gullies unsuited to agriculture.

In the northwest of the district kanuka is the dominant canopy tree and is found clothing the sides of many larger stream gullies, and in blocks of varying sizes on steeper hill country. Many tall straight stands occur and in places second growth tree species such as marbleleaf, kohuhu, pigeonwood, mapou and mahoe form small pockets within the kanuka forest. Introduced animals have severely modified many of these kanuka forests and treelands, but in those areas closed to stock and kept relatively free of feral animals regeneration of broadleaved tree species is occurring under the kanuka canopy. A few larger broadleaved tree species also occur in pockets, particularly in gullies and on damper sites. These trees are mainly titoki and rewarewa. Podocarps, mostly matai and kahikatea, are found scattered throughout this northern zone, though they are not common. Manuka is not uncommon but is generally restricted to smaller pockets associated with the far more abundant kanuka.

On the eastern side of the ecological district domination by exotic vegetation is almost complete. What little native vegetation remains is restricted to the slopes of the Raukawa Range and comprises a mix of highly modified forests and treelands dominated in most instances by titoki. Totara, matai and kahikatea are common, although almost all of the large trees are long gone, and rewarewa, mahoe, kaikomako, lacebark, pigeonwood, ngaio and cabbage trees are all well represented. Almost all of these forest and treeland areas are grazed to a greater or lesser degree, regeneration is minimal and for many areas the future is uncertain.

An area of rolling to steep hill country in the southwest of the district and to the west of the Ruataniwha Plains contains the majority of tall forest found during the survey. Here totara is the dominant tree of the forested areas and it grows in association with matai, kahikatea, rimu and a mix of broadleaved trees. Of these broadleaved trees the most common are mahoe, pigeonwood, black maire, rewarewa, pokaka and cabbage trees. While there are many areas of totara-dominant forest there are also extensive areas of open totara treelands and paddocks of scattered totara trees, mostly intensively grazed by stock and with no understory. Though they have very little species diversity these areas of treeland add greatly to the character of this locality. Totara trees here are hosts to the mistletoe *Ileostylus micranthus*, now rare in the Hawke's Bay region. Black beech makes an appearance here and is found mostly on steeper faces, spurs and the sides of steep gullies running from the western ranges.

The majority of wetlands surveyed are located toward the east of the district and all have been greatly modified by human activity. This has in most cases resulted in a narrow fringe of native vegetation surrounding the wetland dominated by raupo, *Carex* and *Juncus spp.* Almost all of the wetland areas have pasture growing close to the water's edge and in many cases stock have access to the wetland itself. None of the wetlands surveyed had any significant areas of native woody vegetation apart from a very small wetland in RAP 39.

The 40km of coastline is almost devoid of significant areas of native vegetation, the only exception being the small colony of *Muehlenbeckia ephedroides* at Te Awanga (RAP 15) and a small area of coastal forest and scrub near Clifton (RAP 16).

Fauna

With the loss of such huge areas of native vegetation from the lowlands of Hawkes Bay a correspondingly large reduction in native fauna has occurred. Birds, reptiles, fish, bats and invertebrates would have been plentiful in the forests and rivers at the beginning of human settlement but by the turn of this century had been largely supplanted by a wide range of introduced wildlife more adapted to open country and more able to cope with the effects of predation by animals such as cats, mustelids, rats and man himself.

Of particular note within the Heretaunga ecological district are the larger freshwater wetlands supporting high numbers of waterfowl and waders including such threatened species as Australasian bittern, dabchick and banded dotterel, and the larger estuaries with significant resident and transitory populations of coastal and wading birds. Common bush birds including NZ pigeon and tui are widespread throughout the northern and western areas of the district and kaka and falcon are occasional visitors. It is possible that a very small population of brown kiwi still remains in the north of the district and fernbird and pied tit are found in a few small isolated pockets.

Long-tailed bats have been recorded from several sites in the southwest of this district and one near Havelock North. It is possible that they are more widespread than is indicated by records.

Many species of native freshwater fish inhabit the rivers and lakes, the most common and widespread being long and shortfinned eels. Various species of *galaxiids* and bullies occur in most rivers and torrentfish are recorded from some of the larger shingle based streams.

METHODS

Familiarisation

The first step of the survey was familiarisation with the aims and objectives of the Protected Natural Areas Programme and this was undertaken in mid October of 1993. Following this the Lowlands of Hawke's Bay" (Stage One PNAP Survey), (Fromont and Walls, 1988) was read and information was gathered on existing protected natural areas within the Heretaunga ecological district.

A set of NZMS 260 series topographical maps was obtained and on these maps the ecological district boundary was marked and all areas of significant native vegetation or known sites with natural values were marked. Researching of Departmental files, questioning of Department of Conservation staff and a brief inspection of the SSWI and WERI¹ inventories turned up several other sites worth inspection.

An aerial survey was then undertaken over the northern half of the ecological district and brief notes were made for those areas circled on the topographical maps. Any areas of significant native vegetation felt worthy of inspection were noted, and the few that were not were deleted from the map. The southern half of the district was not surveyed from the air as access to this area was considerably easier.

Priorities for survey were with areas of 5 ha and above unless smaller areas were known to contain outstanding natural values. Those areas identified by Fromont and Walls as being key sites were automatically included in the survey.

Although a few protected natural areas were visited during the course of the PNAP survey, information on most of the existing protected natural areas was obtained from the Conservation Management Strategy and from local knowledge gained by the author during previous field work within the Napier Field Centre area of operations.

Field Survey

Field surveying of the areas identified during familiarisation commenced approximately two weeks into the survey. All sites were visited on foot or by vehicle apart from the Ngaruroro, Tukituki and Waipawa rivers and Lake Poukawa. Much information on these sites was available from files and existing reports.

The areas were surveyed roughly from north to south and where possible contact was made with the landowner and a meeting was arranged. In a number of cases this meeting was not possible and only telephone contact was made. Most landowners were happy to allow access, many were enthusiastic about protection and only one outright refusal was given, though a few were suspicious about the use to which information would be put.

¹ SSWI = Sites of special wildlife interest. (New Zealand Wildlife Service habitat inventory database).
WERI = Wetlands of Ecological and Representative Importance. (An inventory of information on important remaining wetlands).

On arrival at each site a walk through survey, usually requiring between 1 and 3 hours, was carried out and a survey form was completed (see Appendix 5). During the site inspection particular attention was paid to vegetation patterns and descriptions, plants (both native and exotic) were listed as they were seen, and fauna was recorded.

The landforms and topography were briefly described and any modifiers or threats were described and ranked. Using the selection criteria described by Myers *et al* (1987) each site was given a ranking of low, medium, high or unknown. A significance rating of local, ecological district, regional, national or unknown was also given to each site. At this stage of the survey these rankings were tentative only and most were reassessed at the completion of the field survey once a better knowledge of the complete district was obtained. Also noted on the form were any other values associated with each site including recreational, economic, spiritual or education values.

Landowner attitude was noted if known and protection requirements such as fencing and weed control were given an urgency ranking of high, low or medium. General comments were added at this stage but recommendations were not made until all sites had been surveyed and the evaluation process was complete.

At many sites photographs were taken and these are held, along with all the survey forms, by the Department of Conservation, Napier.

Evaluation

Evaluation of the surveyed sites began with an assessment of the adequacy of existing protected natural areas. It was found that existing protected natural areas only covered a small part of the range of ecological units² represented within the Heretaunga ecological district, mostly podocarp dominant forest on alluvial terraces. With this in mind it was decided to select as RAPs examples of all ecological units known to exist in the district.

Following the method used for the Eastern Hawkes Bay Ecological District Survey report (Maxwell, Adams and Walls, 1993), landform features were listed down the left side of a table and vegetation types along the top row (see Table 1). Each surveyed site was then checked against this table and marked into an appropriate box.

Once this process was complete the table was assessed and those sites of obviously low natural values were removed. At this stage the selection criteria listed by Myers *et al*, and ranked on the survey forms, were used as a guide to prioritise those areas of higher natural values and decide which areas became RAPs.

The selection criteria are:

Representativeness: The primary criterion. High representative values are given to ecological units which:

- (1) Have larger overall areas in the district.
- (2) Have been markedly reduced from their former extent.
- (3) Are poorly represented in reserves.

² An ecological unit is a combination of vegetation types plus the landform it occurs on. As an example this may be podocarp forest on alluvial terraces or totara treeland on upland hills. (Myers *et al* 1987).

<u>Diversity:</u>	The overall richness of ecosystems and species.
<u>Special Features:</u>	Any features of importance or rarity in a particular ecosystem such as geographical features, animals or plants.
<u>Naturalness:</u>	An assessment of how closely the ecosystem reflects its former state.
<u>Viability:</u>	The ability of an area to retain its natural values over time.
<u>Size and Shape:</u>	An important factor, especially with regard to diversity and viability.
<u>Buffering:</u>	The relationship a natural area has with its surrounding landscape and external influences.
<u>Fragility and Threat:</u>	A measure of the sensitivity of habitats and ecosystems to environmental change.

A total of 42 RAPs were selected using this system, representing 41 ecological units. Many of these RAPs have outstanding natural values, others were chosen because they represent the only or best example of that particular ecological unit occurring within the ecological district. A few RAPs are represented in more than one ecological unit. In a few cases other ecological units did occur but the quality was not considered sufficient to include these sites as RAPs, mainly due to small size or extreme modification.

The RAPs chosen represent the best of what is left but there are also many other areas that have significant natural values. While the RAPs should be given priority for future protection, natural areas in this ecological district so few that even less significant and smaller remnants assume great importance. They should not be overlooked and every effort should be made to encourage the protection of these often small and modified areas.

TABLE 1

**ECOLOGICAL UNITS OF THE HERETAUNGA ECOLOGICAL DISTRICT
SHOWING RAP'S AT WHICH THEY ARE REPRESENTED**

	Coastal Forest	Coastal Scrub	Beach Vegetation	Estuarine Vegetation	Freshwater Wetland Vegetation	Riverbed/ Riverbank Vegetation	Forest, treeland and scrub dominated by manuka and kanuka	Scrub dominated by other species	Forest dominated by podocarps	Forest dominated by broad- leaved trees	Forest dominated by beech	Treeland of totara	Treeland of other species
Alluvial Plains							35		28				
Alluvial Terraces					11	12,42 (1)	2,5,7 (1)		19,36 (3) (4) (6) (7) (9)	39		34	
Lowland Hills <300m	16						1,5		19,20,29, 33	30	17		22,30
Upland Hills >300m							3,4	17	27,31,37 (4) (5)	17,30,32, 39	17,37,38 (7)	26	
Beaches			15 (15)										
Estuaries			10,14	10,14 (11) (13)		10,14							
Wetlands					6,8,9,11,18 23,41 (10)				39				
Braided Riverbeds						12,42							
Riparian Strips	16	16					1,2,3,4,5,7		13 (2)	7,21,25 (8)	24,37,40		
Cliffs/Bluffs	16	16					1,2,3,4,5,7	25		25,39	37		

Numbers in brackets () refer to existing PNA's (See Appendix 3)

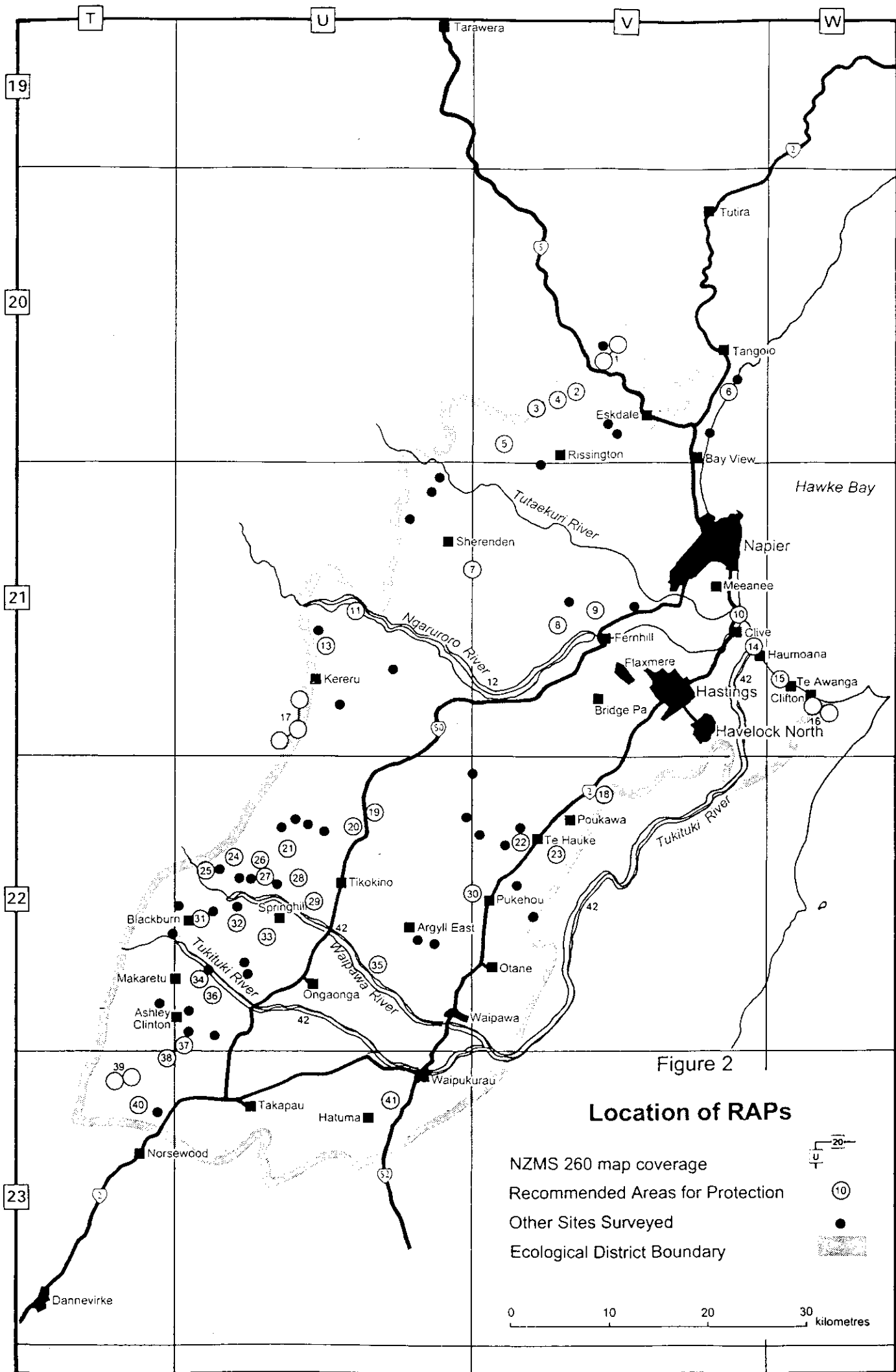
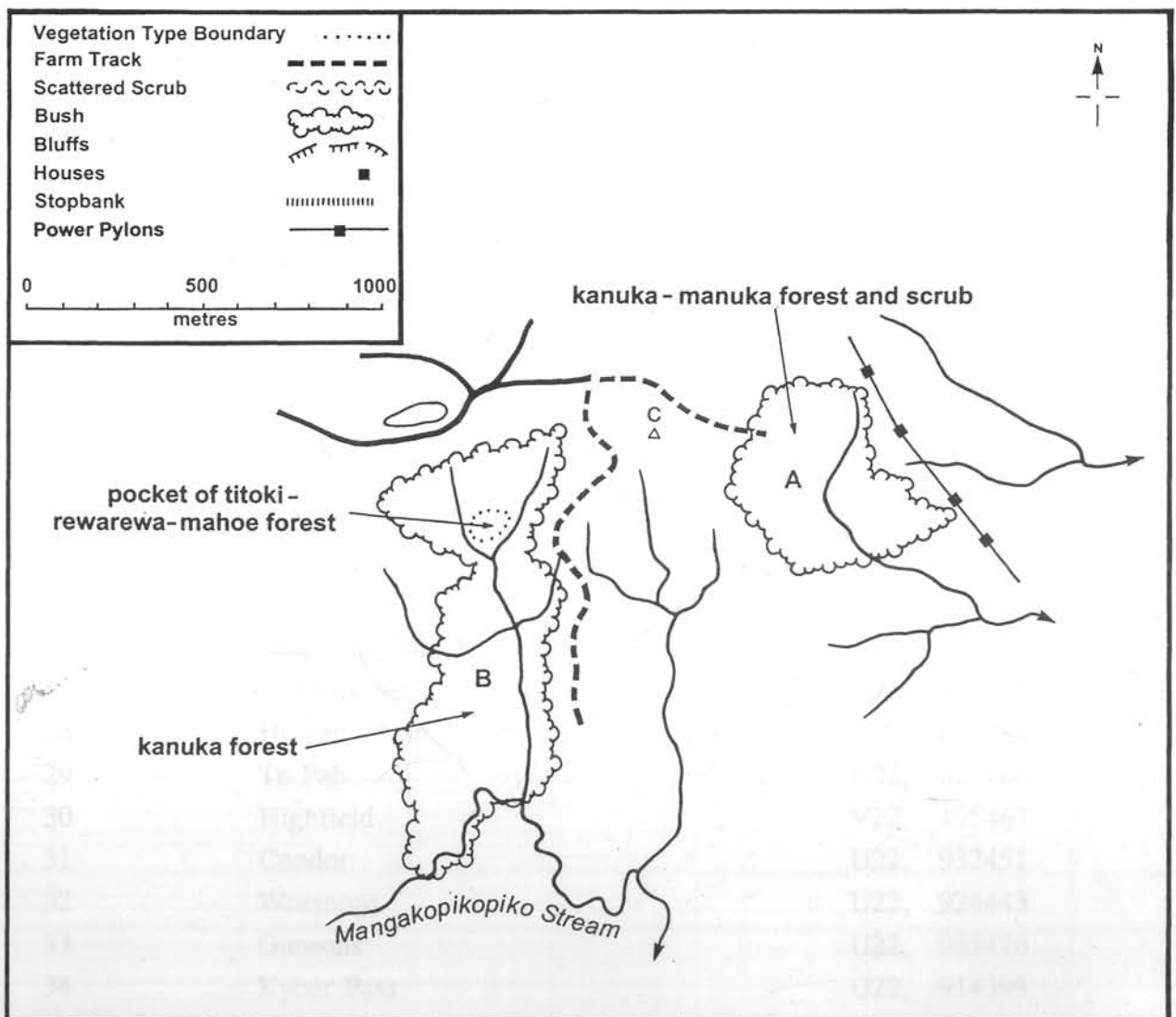
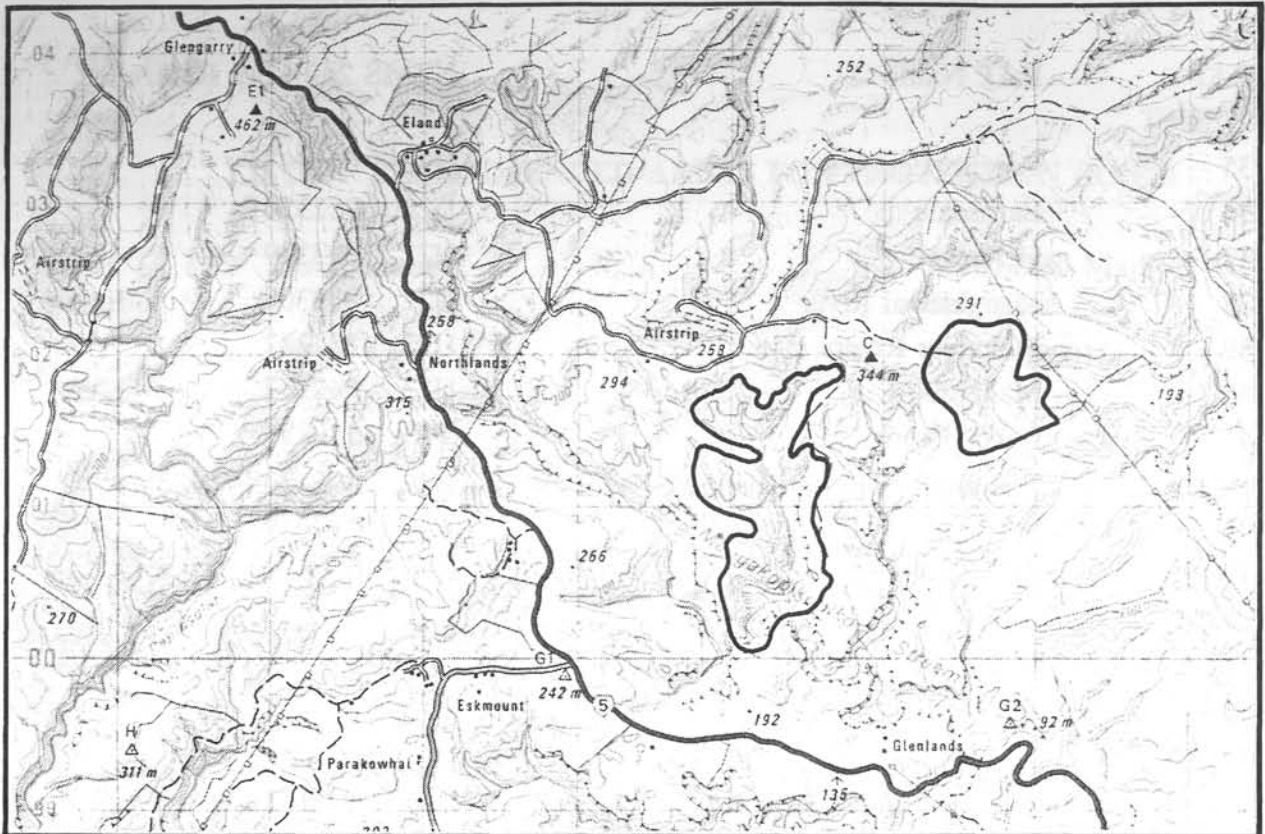


TABLE 2**LIST OF RECOMMENDED AREAS FOR PROTECTION (RAPs)**

RAP Number	RAP Name	NZMS 260 Map Reference
1	Eland	V20, 356018
2	Peninsular Stream/Mangaone River	V20, 292983
3	Mangahina No 1	V20, 252966
4	Mangahina No 2	V20, 280967
5	Waiiti Stream	V20, 225935
6	Whirinaki Lagoons	V20, 461975
7	Okawa Stream	V21, 192802
8	Runanga Lake	V21, 285735
9	Oinga Lake	V21, 322755
10	Waitangi Estuary	V21, 474755
11	The Pigsty	U21, 084763
12	Ngaruroro Riverbed	U21, 040771 to V21, 320729
13	Ohara	U21, 041731
14	Tukituki Estuary	V21, 485712
15	Te Awanga	W21, 507677
16	Clifton	W21, 535655
17	Poporangi Stream	U21, 998628 (4 areas)
18	Pekapeka Swamp	V22, 323573
19	Glentui	U22, 091550
20	Puahanui Bush	U22, 075535
21	Mangamauku Stream	U22, 000523
22	Haronga Road	V22, 236514
23	Lake Poukawa	V22, 270515
24	Mangaoho No 2	U22, 945515
25	Smedley Bluffs	U22, 925509
26	Mangaoho No. 1	U22, 971519
27	Holdens No 2	U22, 975495
28	Holdens Bush	U22, 015488
29	Te Pah	U22, 025466
30	Highfield	V22, 195467
31	Condor	U22, 932451
32	Worsnops	U22, 924443
33	Gunsons	U22, 985426
34	Kyber Pass	U22, 914399

RAP Number	RAP Name	NZMS 260 Map Reference
35	Eastern Equities	U22, 091401
36	Barnsdale	U22, 922370
37	Herricks	U22, 893329
38	Mangatewai River	U22, 883305
39	Makaretu River	U23, 824282
40	Mahurauti	U23, 847257
41	Lake Hatuma	V23, 110255
42	Tukituki/Waipawa Riverbed	U22, 898420/935483 to V21, 475702



RAP 1: Eland

Survey form(s): **Area A:** V20/3 Grid reference: **Area A:** V20, 356018
 Area B: V20/4 **Area B:** V20, 343010

Area: **Area A:** 45 ha Altitude: **Area A:** 140-290m
 Area B: 85 ha **Area B:** 80-230m

Landform: This RAP consists of two areas of moderate to steep gully heads and short ridges dropping abruptly into small, entrenched streams. A number of small recent slips have occurred on the eastern side of area A. Area B contains many areas of steep bluffs, especially on the south and east sides.

Vegetation:

Area A - Mixed manuka-kanuka forest and scrub covers most of this area with some small grassed areas (<5% and confined mainly to the perimeter). Other native tree species present are mahoe, marbleleaf, cabbage trees and tree ferns. A sparse understorey of regenerating kanuka, *Helichrysum lanceolatum*, low blackberry and ferns is present.

Area B - Kanuka forest of ~10-15m tall with a few small areas of manuka (<5%). There is a small pocket of mature titoki-rewarewa-mahoe forest near the north end of this area. The understory ranges from sparse on the drier slopes to moderate in the damper gulleys and comprises mainly regenerating kanuka, *Helichrysum lanceolatum* and low ferns.

Fauna: Low-moderate numbers of goats inhabit this RAP and possums are present in moderate numbers. Stock have access to both areas but sign was less evident in the interior and on steeper slopes.

Cultural: No archaeological sites are recorded.

Modifiers/Threats:

- Occasional large wilding pines are scattered throughout both areas.
- Domestic stock and goats are affecting understory regeneration, especially around fringes.
- There is potential for wildfire, though this is not likely.
- Firewood cutting is a potential threat around the edges of both areas.

Selection criteria:

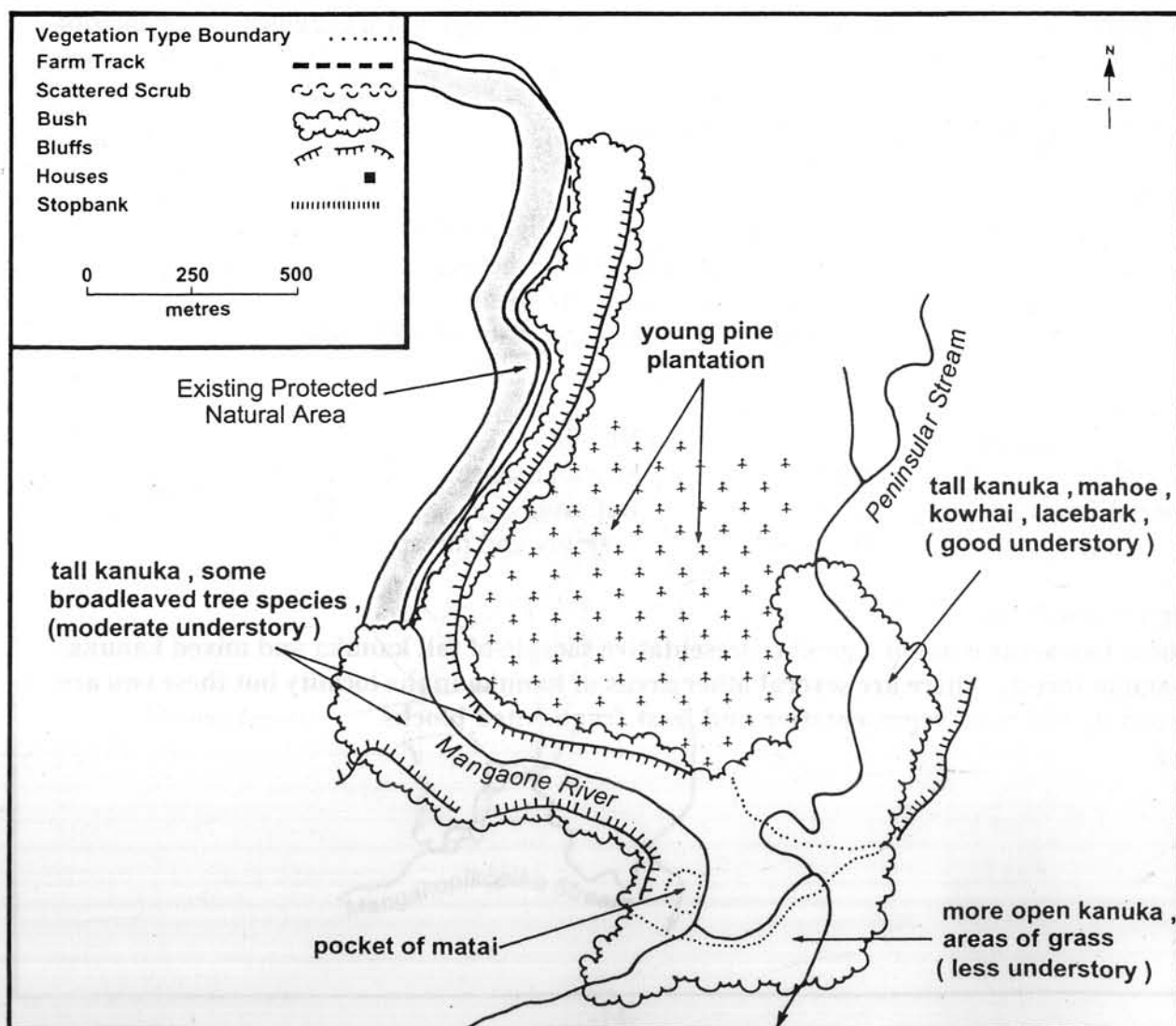
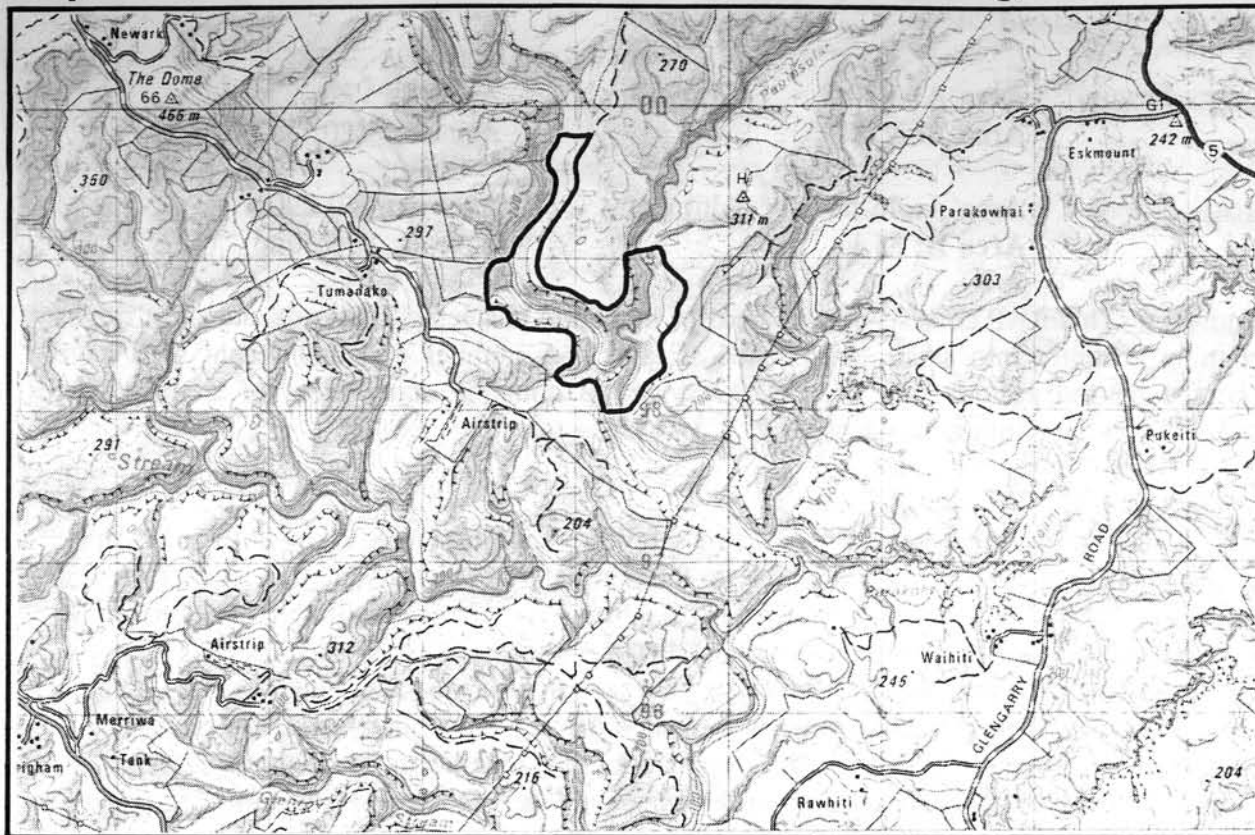
Representativeness	H	Viability	H
Diversity	L-M	Size and shape	H
Special features	L	Buffering	H
Naturalness	H	Fragility and threat	L

Significance: M

These two areas contain a good representative sample of tall kanuka and mixed kanuka-manuka forest. There are several other areas of kanuka in the locality but these two are probably the most representative and least fragmented blocks.

Rap 2

Peninsular Stream / Mangaone River



RAP 2: Peninsular Stream/Mangaone River

Survey form(s): V20/10

Grid reference: V20, 292983

Area: 70 ha

Altitude: 100-200m

Landform: The Mangaone River and Peninsular Stream in this area both flow through narrow and steep-sided entrenched gorges of mudstone surrounded by rolling to steep hill country. Both waterways contain some low terraces up to about 50m wide but mostly the gorge sides rise steeply from the riverbanks, becoming steeper at the top rim of the gorge before abruptly easing to gentler slopes.

Vegetation: Kanuka-mixed broadleaved forest. Tall even aged stands of kanuka with a few broadleaved trees such as mahoe, titoki, kowhai, and lacebark scattered throughout. The lower Peninsular Stream contains areas of kanuka with a very good subcanopy of rangiora, mahoe, lacebark, *Myrsine divaricata* and small titoki, while the more northerly aspect faces are drier, have almost no understory and contain a few areas of open grassland. There is a small pocket of mature matai (< 1ha) on the Mangaone River growing half on a small terrace and half on a hill slope containing ~ 10 large trees. These were the only podocarps seen.

Fauna: Goats are present in this area, probably in low to moderate numbers throughout, though most sign was seen in the Mangaone riverbed. Moderate amounts of possum sign were seen and deer are present in low numbers.

Bird species include most common bush and pasture birds. Blue duck have been reported from the Mangaone headwaters. The river itself contains common bully, redfinned bully, torrentfish, long and shortfinned eels and brown and rainbow trout.

Cultural: No archaeological sites are recorded.

Modifiers/Threats:

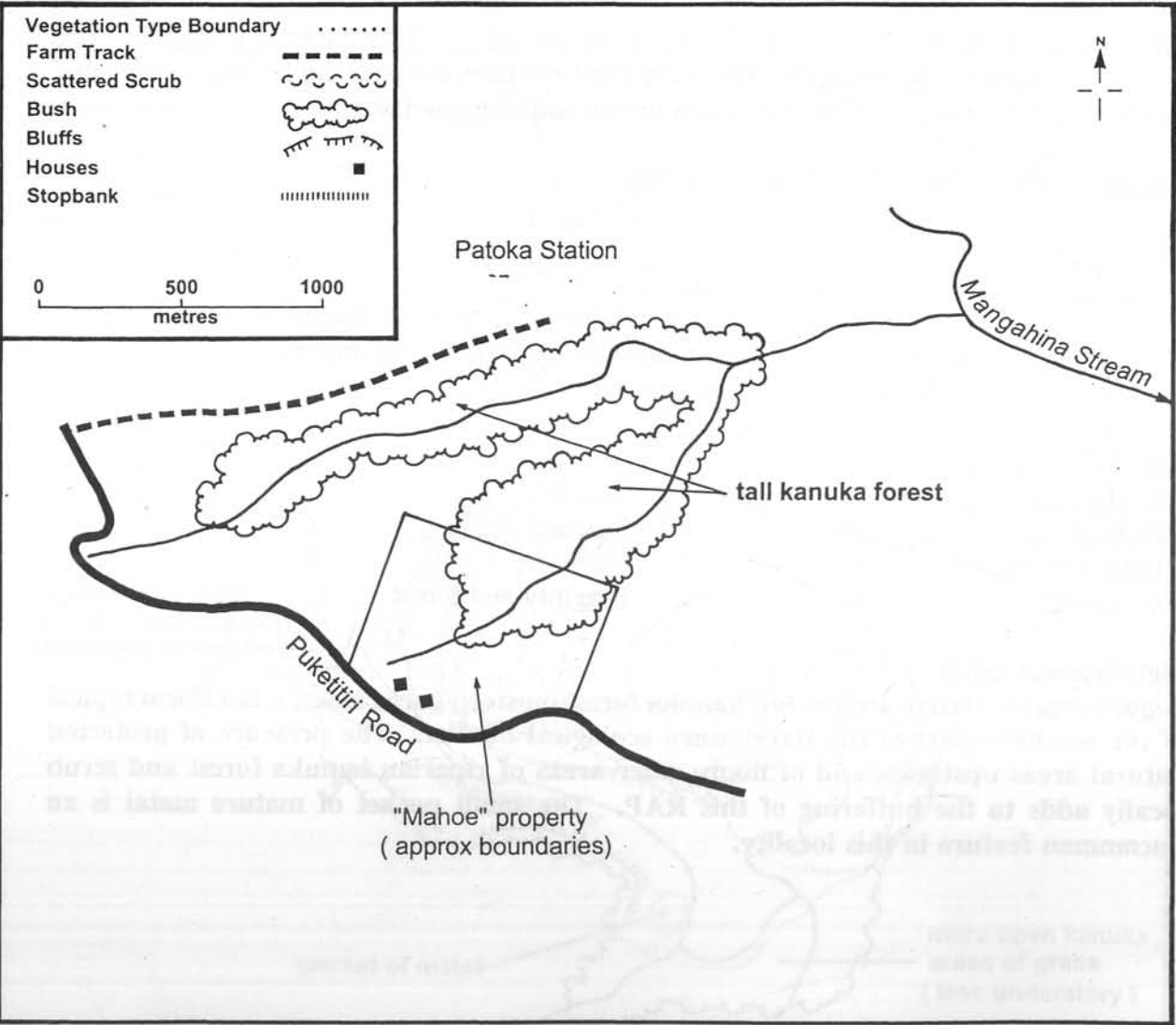
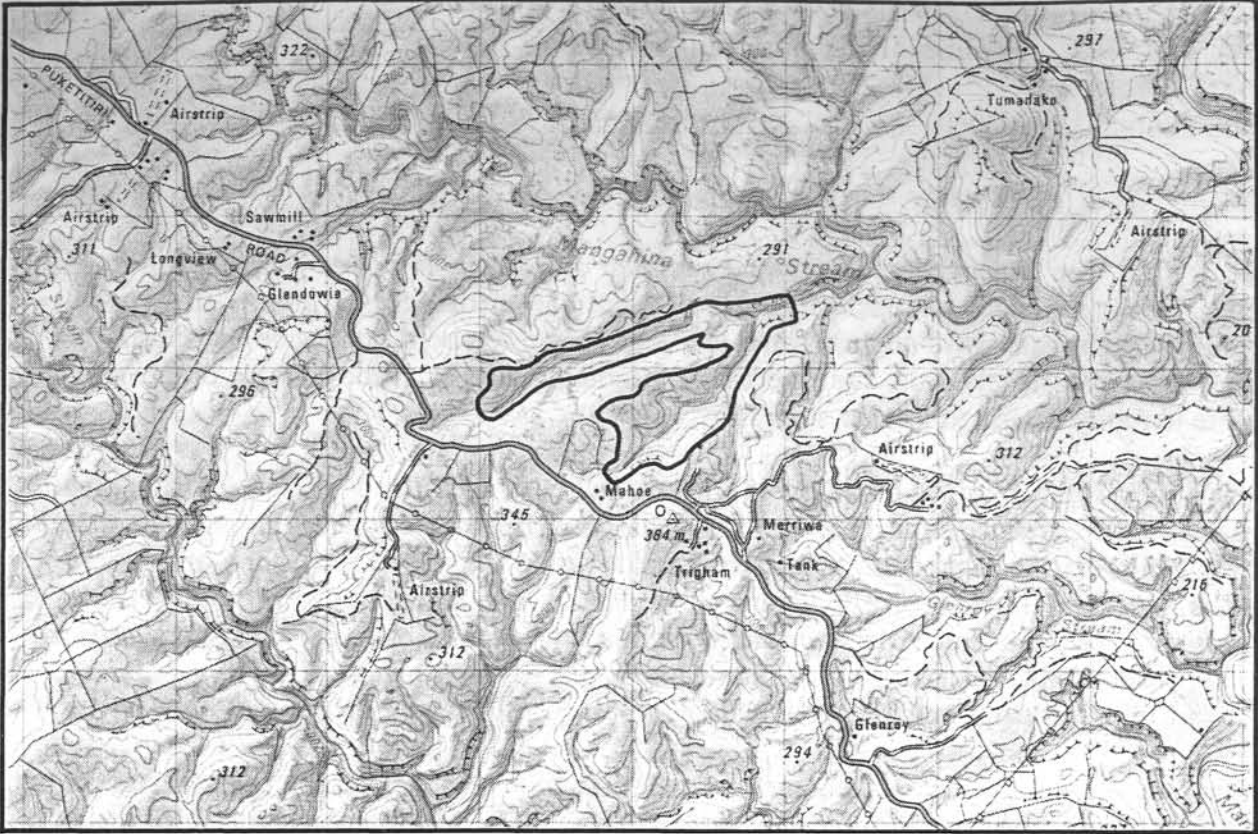
- Some small areas of pussy willow in the river bed.
- There is a threat of wilding pine infestation from surrounding plantation forests.
- Goats are having a minor effect on understory regeneration in places.
- There is a potential for wildfire, though this is not likely.

Selection criteria:

Representativeness	H	Viability	H
Diversity	M	Size and shape	H
Special features	M	Buffering	H
Naturalness	H	Fragility and threat	L

Significance: M-H

A good representative area of tall kanuka forest on steep gorge sides, a landform typical of the northern part of the Heretaunga ecological district. The presence of protected natural areas upstream and of many other areas of riparian kanuka forest and scrub locally adds to the buffering of this RAP. The small pocket of mature matai is an uncommon feature in this locality.



RAP 3: Mangahina No. 1

Survey form(s): V20/8 Grid reference: V20, 252966

Area: 90 ha Altitude: 200-360m

Landform: Two small streams flowing to the northeast and into the Mangahina Stream form this RAP. The lower gully sides are very steep and the gradient eases gradually to the ridges on both sides of the streams. There are a few small outcrops of limestone on the surrounding farmland and small bluffs occur in places within the RAP.

Vegetation: Kanuka-mixed broadleaved forest. Kanuka is dominant over most of this area with a few small pockets of broadleaved species such as mahoe, marbleleaf, rewarewa and kowhai occurring in the damper gulleys and on the shadier aspect slopes. The understory is generally open to moderately dense and comprises regenerating broadleaved tree species and ferns in the gulleys. Mingimingi (*Leucopogon fasciculatus*) and *Helichrysum lanceolatum* are the predominant species on the drier and higher sites of the upper gully slopes. There are some areas of pasture grass around the perimeter and occasional radiata pine scattered throughout.

Fauna: Goats and possums are present in low numbers and are controlled by the landowner. Occasional deer are also present.

Domestic stock have access to the area but do not penetrate far into the block.

Many common bush birds are reported and pied tits have been seen in recent years. Kiwi have been reported in the past (1950's) but are unlikely to still be in this area. Green gecko are present (SSWI).

Cultural: No archaeological sites are recorded.

Modifiers/Threats:

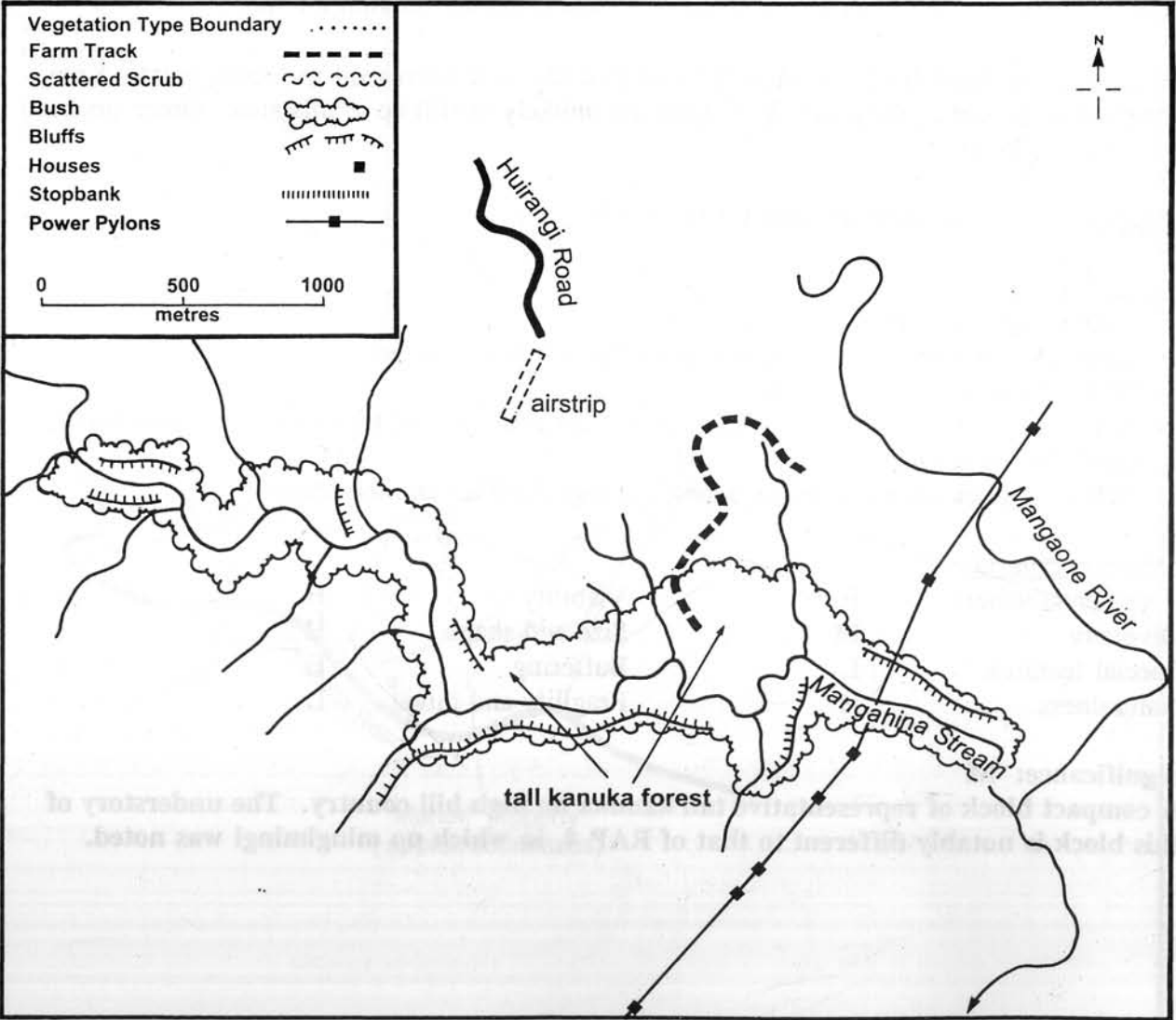
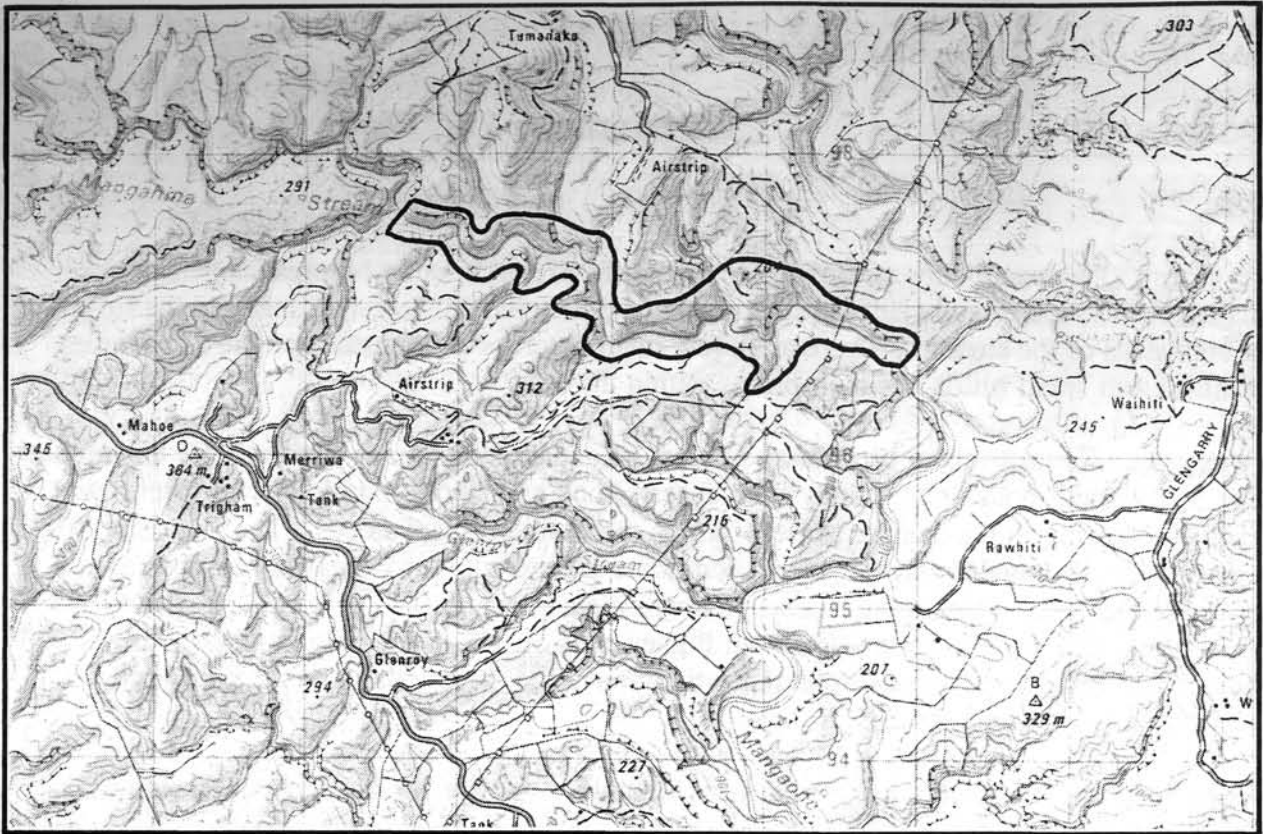
- Radiata pine is scattered thinly throughout.
- Goats and possums are having a minor effect on regeneration.
- There is potential for wildfire.
- There is potential for firewood extraction from the edges of the block, the remainder is probably too steep.
- Domestic stock have had some impact on vegetation around the fringes.

Selection criteria:

Representativeness	H	Viability	H
Diversity	M	Size and shape	H
Special features	L	Buffering	H
Naturalness	H	Fragility and threat	L

Significance: M

A compact block of representative tall kanuka on high hill country. The understory of this block is notably different to that of RAP 4, in which no mingimingi was noted.



RAP 4: Mangahina No. 2

Survey form(s): V20/9 Grid reference: V20, 280967

Area: 130 ha Altitude: 100-250m

Landform: A deep meandering stream gorge of the Mangahina Stream. The gorge sides range from steep to very steep with a few vertical bluffs and steep slips. Several small, steep tributary streams feed into the main stream from both sides over the length of the gorge. There are some small stream terraces and flats on the Mangahina Stream but mostly the gorge sides rise steeply from the stream to the top of the gorge.

Vegetation: Kanuka-mixed broadleaved forest. Kanuka is dominant with broadleaved trees scattered throughout but more common in the gullies and comprising ~ 10% of the canopy trees. Common broadleaved tree species are mahoe, kowhai, *Pittosporum ralphii*, titoki, cabbage tree and lacebark. There are a few small matai up to ~ 10m tall.

The understory is generally sparse and comprises *Helichrysum lanceolatum*, *Coprosma rigida*, *Melicope simplex*, rangiora, tree nettle and low ferns. No mingimingi was noted in this RAP, unusual as ~ 5km upstream in RAP 3 mingimingi is the dominant understory plant.

Mature radiata pines are thinly scattered throughout and there is a small amount of low blackberry, mostly around the fringes. There are a few small areas of open grass, <10% of the area.

Fauna: Low numbers of goats are present and probably a few deer live in the gorge. Possums are present and domestic stock graze the gorge, more commonly on the easier slopes and fringe areas. Common bush birds are present, probably nothing unusual or rare.

Cultural: No archaeological sites are recorded.

Modifiers/Threats:

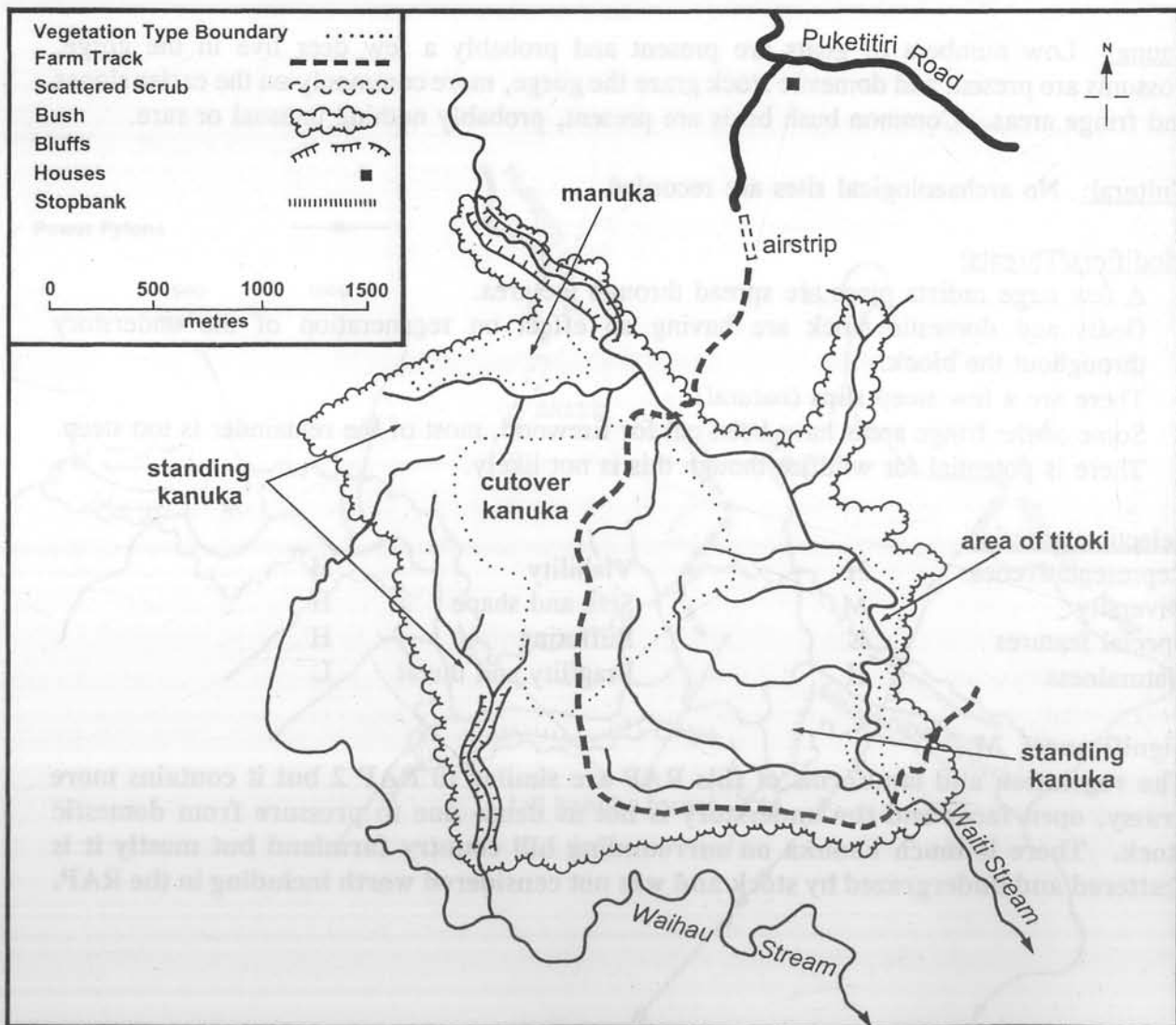
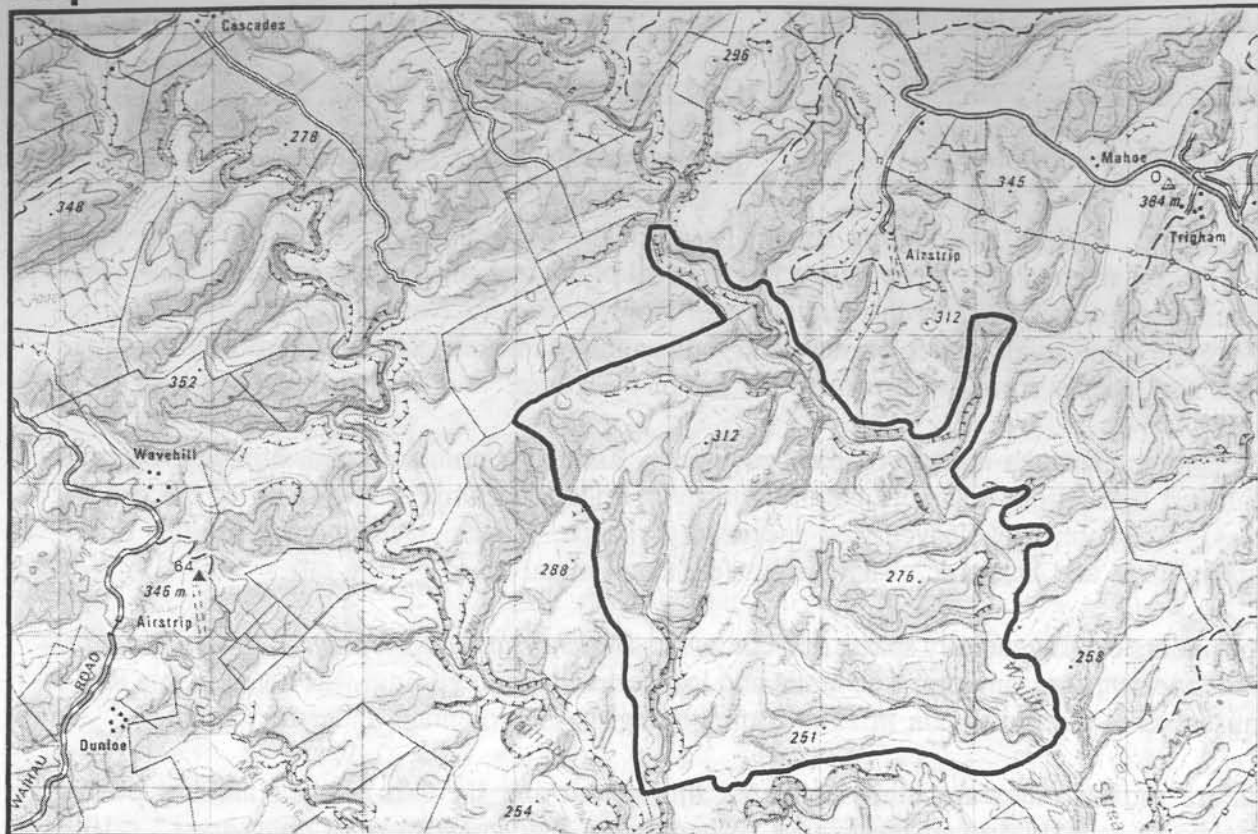
- A few large radiata pines are spread through the area.
- Goats and domestic stock are having an effect on regeneration of the understory throughout the block.
- There are a few steep slips (natural).
- Some of the fringe areas have been cut for firewood, most of the remainder is too steep.
- There is potential for wildfire though this is not likely.

Selection criteria:

Representativeness	H	Viability	H
Diversity	M	Size and shape	H
Special features	L	Buffering	H
Naturalness	H	Fragility and threat	L

Significance: M

The vegetation and landforms of this RAP are similar to RAP 2 but it contains more grassy, open faces and the understory is not as dense due to pressure from domestic stock. There is much kanuka on surrounding hill country farmland but mostly it is scattered and undergrazed by stock and was not considered worth including in the RAP.



RAP 5: Waiiti Stream

Survey form(s): V20/11 Grid reference: V20, 225935

Area: ~ 780 ha Altitude: 120-300m

Landform: A large block of easy hill country and broad ridges dropping into deeply incised stream gorges. The Waiiti Stream has cut a deep gorge along the northeast side of the area and numerous small streams drop steeply into this gorge.

Vegetation: Kanuka forest. This RAP is predominantly tall kanuka of a fairly even age, trees are ~ 20-30cm DBH and ~ 10-12m tall. The canopy over the uncut areas of the block is quite dense with very few natural clearings. There are some small areas of tall manuka scrub on the western side of the area and pockets of titoki on the lower slopes of the Waiiti Stream gorge but together this vegetation makes up < 10% of the total area. A few other broadleaved trees, mostly mahoe, marbleleaf and kowhai are scattered thinly through the gullies.

The understory is almost nil on the upper slopes and ridges and is sparse in the gullies, comprising mainly *Coprosma rigida*, *Helichrysum lanceolatum* and low ferns. The cut-over areas contain rapidly regenerating kanuka up to ~ 2m tall, pasture grasses, pasture weeds and small areas of *Juncus sp.*

Fauna: Goats are abundant throughout the area and possums are present in low numbers. Domestic stock have access throughout but avoid the steeper stream gorges. Most common bush birds are present including high numbers of bellbirds (SSWI). Pied tits are present in good numbers and kiwi are reported as having been present in the 1950-60's by the landowner. He thinks there may still be one or two near the western side of the block. The Waiiti Stream contains longfinned eels, koura and there is one report of a black flounder being caught in the past.

Modifiers/Threats:

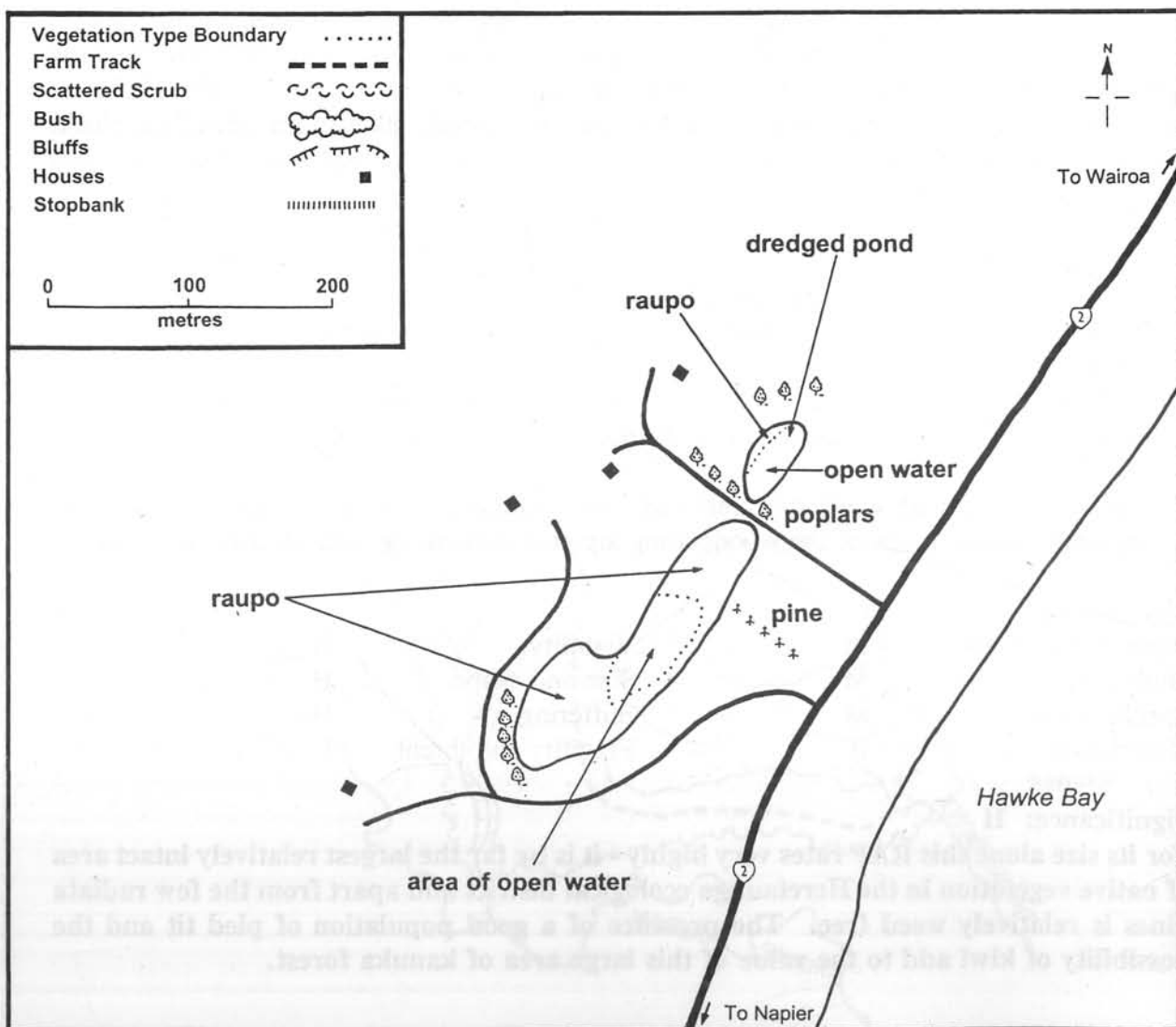
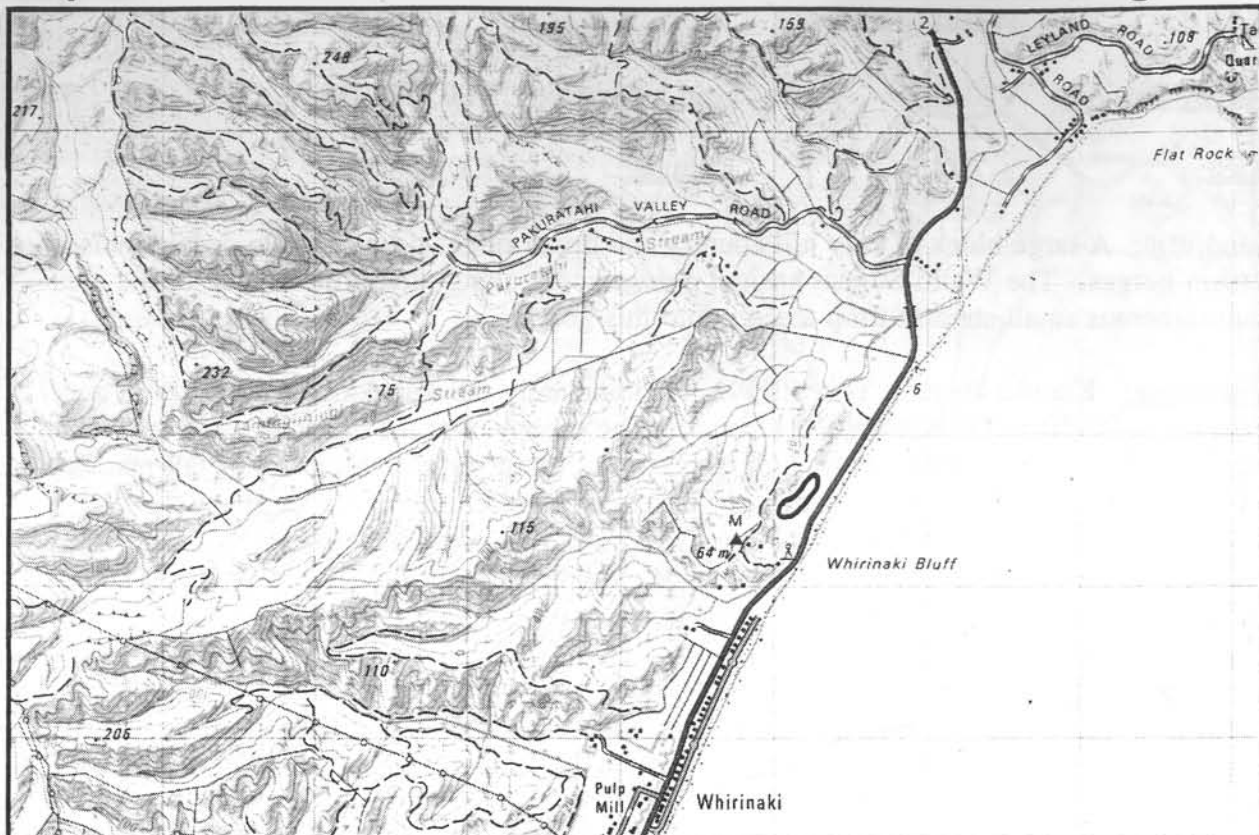
- ~ 20 mature radiata pine are scattered throughout.
- Goats and domestic stock are having a high impact on the understory.
- There is a potential for wildfire.
- A large area in the centre of the RAP has been felled for firewood over the past 10 years and it is possible more may be cut in the future, though the present owner does not intend to do so.
- An access road with many side tracks has been bulldozed through the area for firewood removal. Some relics of the woodcutting are still present, eg. old tractors, sheds etc.

Selection criteria:

Representativeness	M	Viability	H
Diversity	M	Size and shape	H
Special features	M	Buffering	H
Naturalness	H	Fragility and threat	L

Significance: H

For its size alone this RAP rates very highly - it is by far the largest relatively intact area of native vegetation in the Heretaunga ecological district and apart from the few radiata pines is relatively weed free. The presence of a good population of pied tit and the possibility of kiwi add to the value of this large area of kanuka forest.



RAP 6: Whirinaki Lagoons

Survey form(s): V20/12

Grid reference: V20, 461975

Area: 5 ha

Altitude: Sea level

Landform: Situated about 10m above sea level and about 150 metres from the sea these two small, shallow dune lakes are located at the base of low hills rising to ~40m. The lakes have formed behind a long shingle bank composed of pea sized gravel washed north from the Ngaruroro and Tukituki Rivers. No streams run into or exit these lakes and their water levels remain fairly constant.

Vegetation: The dominant wetland plant species is raupo, covering about 60% of the pond area. According to the landowners the area of raupo is increasing and open water areas are decreasing. Attempts are being made to increase the area of open water by the landowners. Areas of lake edge not fringed by raupo (~20%) contain pasture grasses, scattered *Juncus* and sedge species and areas of willow weed. A few exotic trees, flax and some native trees are planted around the edges. Surrounding land is pasture with many planted exotics, mostly poplars.

Fauna: There are a few possums and rabbits in the area, and domestic stock graze to the raupo edge in most places. Domestic cats and dogs are present in the houses close by.

Most common waterfowl use the lakes, also dabchick, bittern and spotless crake have been reported.

Recently the lake was prospected commercially for eels but nothing was caught.

Modifiers/Threats:

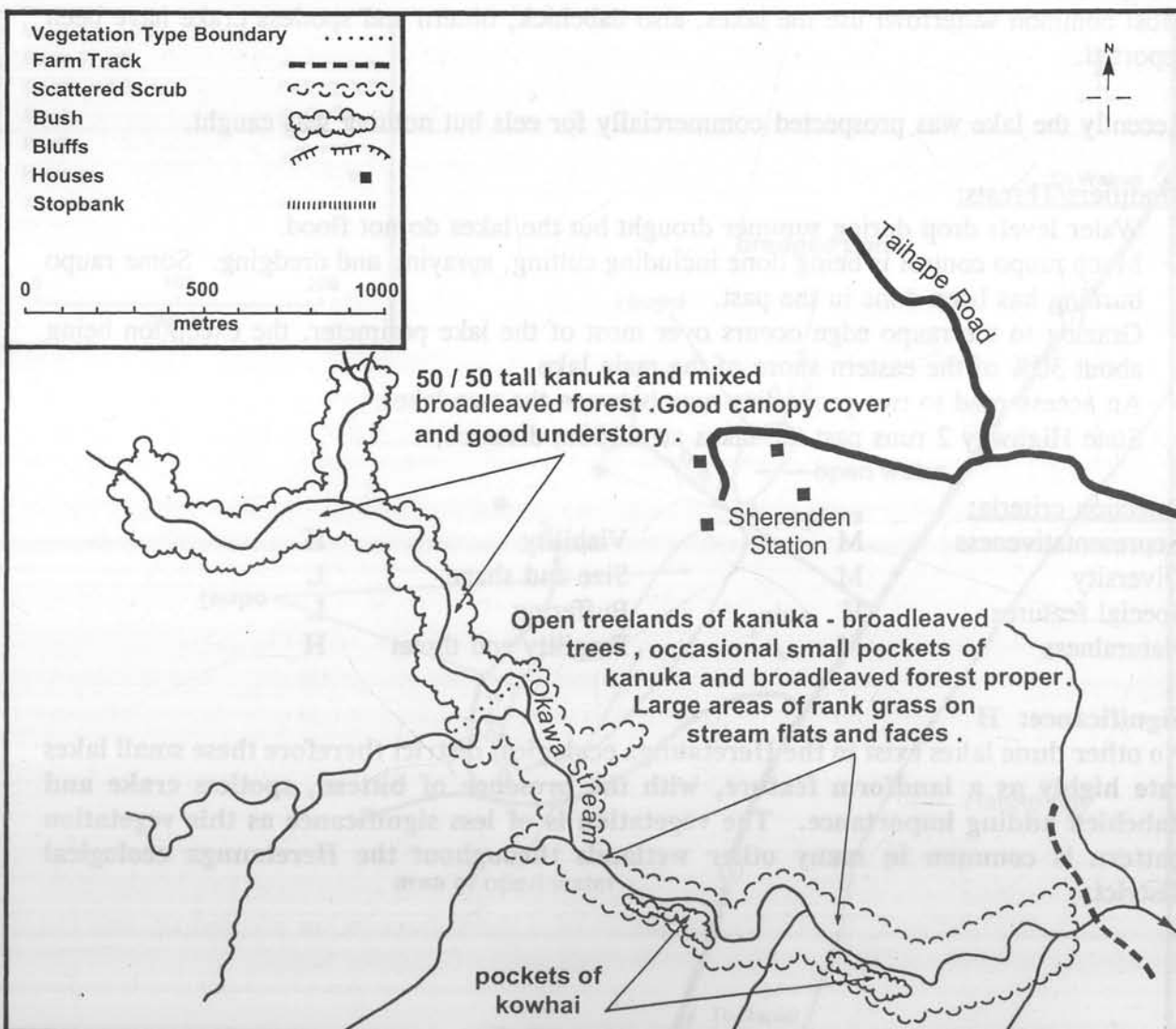
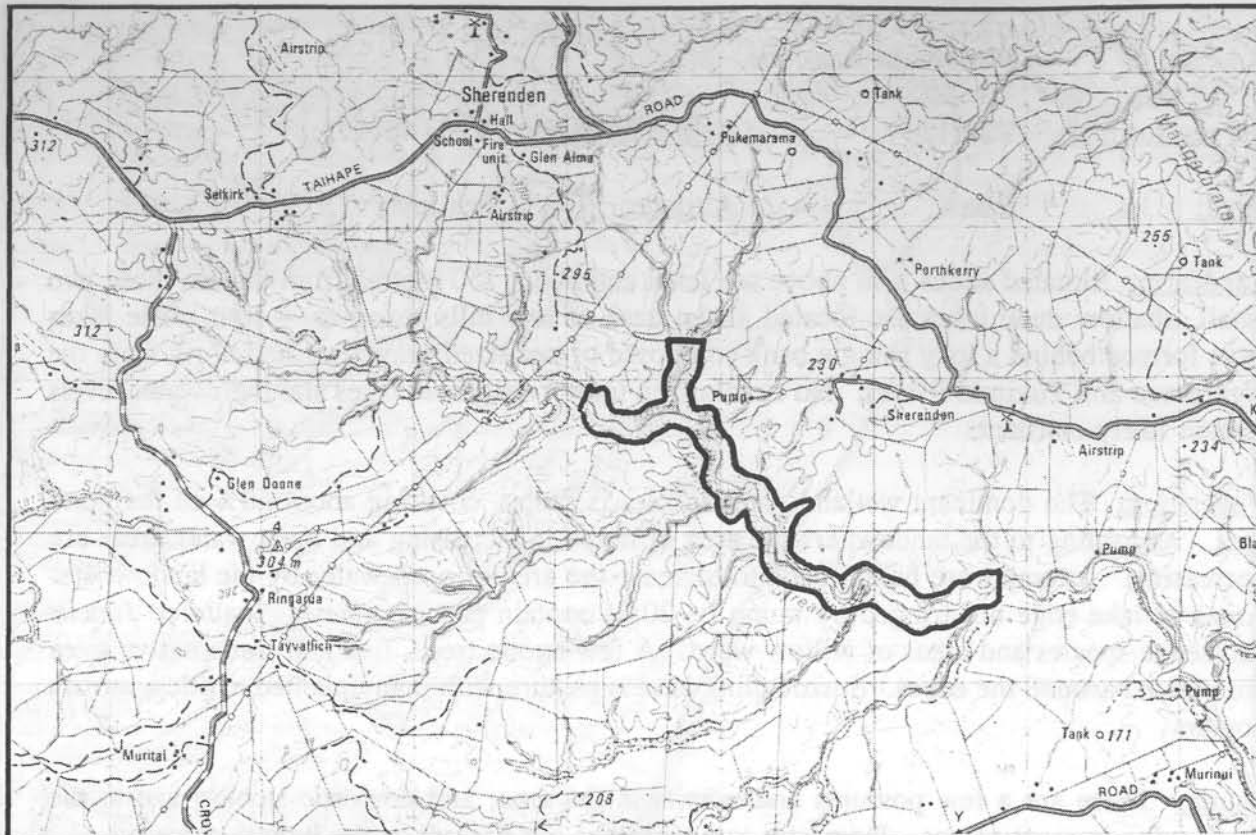
- Water levels drop during summer drought but the lakes do not flood.
- Much raupo control is being done including cutting, spraying and dredging. Some raupo burning has been done in the past.
- Grazing to the raupo edge occurs over most of the lake perimeter, the exception being about 30% of the eastern shore of the main lake.
- An access road to two properties runs between the two lakes.
- State Highway 2 runs past the lakes at ~100m distance.

Selection criteria:

Representativeness	M	Viability	H
Diversity	M	Size and shape	L
Special features	H	Buffering	L
Naturalness	M	Fragility and threat	H

Significance: H

No other dune lakes exist in the Heretaunga ecological district therefore these small lakes rate highly as a landform feature, with the presence of bittern, spotless crake and dabchick adding importance. The vegetation is of less significance as this vegetation pattern is common in many other wetlands throughout the Heretaunga ecological district.



RAP 7: Okawa Stream

Survey form(s): V21/6

Grid reference: V21, 192802

Area: 80 ha

Altitude: 100-200m

Landform: A narrow stream gorge of mudstone and sandstones 60-80 metres deep with steep to vertical sides at the upstream end widening downstream to include many low stream terraces and easier slopes. Surrounding land is easy hill country.

Vegetation:

Upper gorge: A mosaic of 50% tall kanuka and 50% mixed broadleaved forest and scrub. The kanuka is generally of an even canopy height (~ 10m tall) and the broadleaved forest and scrub has a more variable height (6-12m tall). The predominant broadleaved trees are mahoe, kowhai, lacebark, *Pittosporum ralphii* and kohuhu and there is a healthy subcanopy and understory of rangiora, hangehange and ferns. The steeper bluffs generally support mountain flax, toetoe, *Blechnum capense* and grasses.

Lower gorge: Here there are more open treelands of kanuka and mixed broadleaved species with many areas of pasture grass and a few small pockets of kanuka-mixed broadleaved forest. Two pockets of almost pure kowhai exist, growing on dry, steep faces. The understory in the lower gorge area is generally sparse except on slopes inaccessible to stock and parts of the steeper bluffs have no vegetation cover.

Fauna: Goats in moderate numbers (controlled by landowner) and possums are present, along with occasional deer. Domestic stock graze the lower gorge area but there is less sign of their presence in the upper gorge.

Common bush and pasture birds are present, but probably nothing unusual or rare.

Cultural: No archaeological sites are recorded.

Modifiers/Threats:

- Domestic stock and goats are affecting the understory.
- A few natural slips occur on steep bluffs.

Selection criteria:

Representativeness	M	Viability	H
Diversity	M	Size and shape	M-H
Special features	M	Buffering	M
Naturalness	M	Fragility and threat	H

Significance: M

The most valuable areas of this RAP are the upper gorge area of kanuka and broadleaved forest and the two pockets of kowhai. Although kowhai is fairly common in the Heretaunga ecological district these two areas of treeland were the only almost pure stands found. They are at threat in the long term from browsing by goats and would greatly benefit from being fenced.

RAP 8: Runanga Lake

Survey form(s): V21/10

Grid reference: V21, 285735

Area: 160 ha

Altitude: 35m

Landform: Runanga is a long, narrow lake contained between rolling to moderately steep hills with several flat swampy areas at the lake ends and in the inlets. A small stream channel drains the lake at the south end. The lake has a small catchment and water quality and levels remain fairly constant.

Vegetation: An almost continuous band of raupo varying between 10 and 30 metres wide surrounds the lake, and several low lying areas of raupo, flax, pussy willow and *Scirpus lacustris* occur at the lake ends and inlets. Small patches of pussy willow are scattered around the lake perimeter but over most of the shoreline grazed pasture grasses grow to the raupo edge. A few scattered cabbage trees are the only native trees present.

Fauna: Domestic stock graze to the raupo edge. This lake is an important waterfowl breeding and moulting site and rates highly in SSWI. Birds recorded include all common waterfowl as well as bittern, spotless crane, dabchick and scaup. Eels are present in good numbers and are commercially fished.

Cultural: A pa site is recorded at Grid Reference 287756. Other sites are probably present around the lake edge.

Modifiers/Threats:

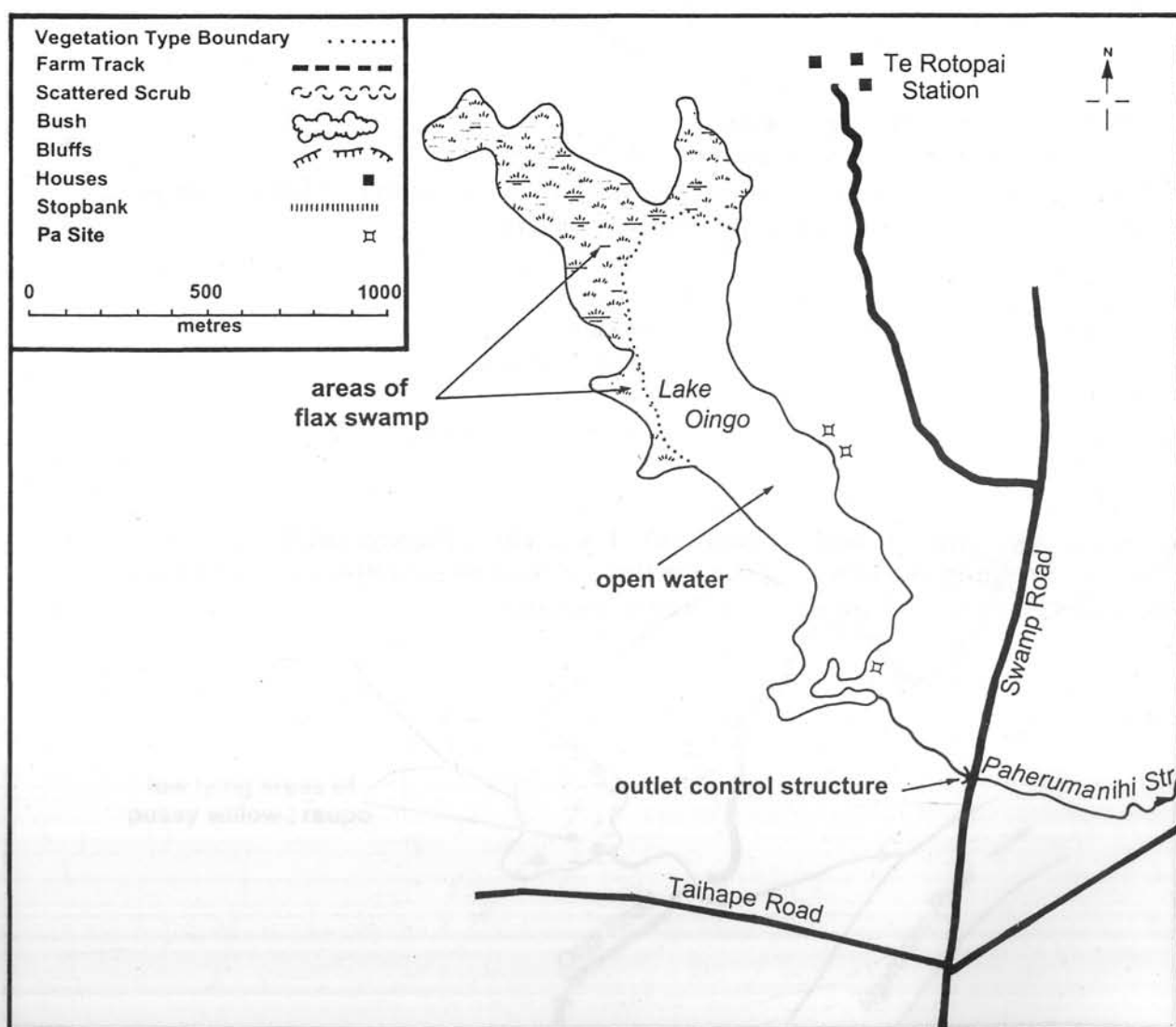
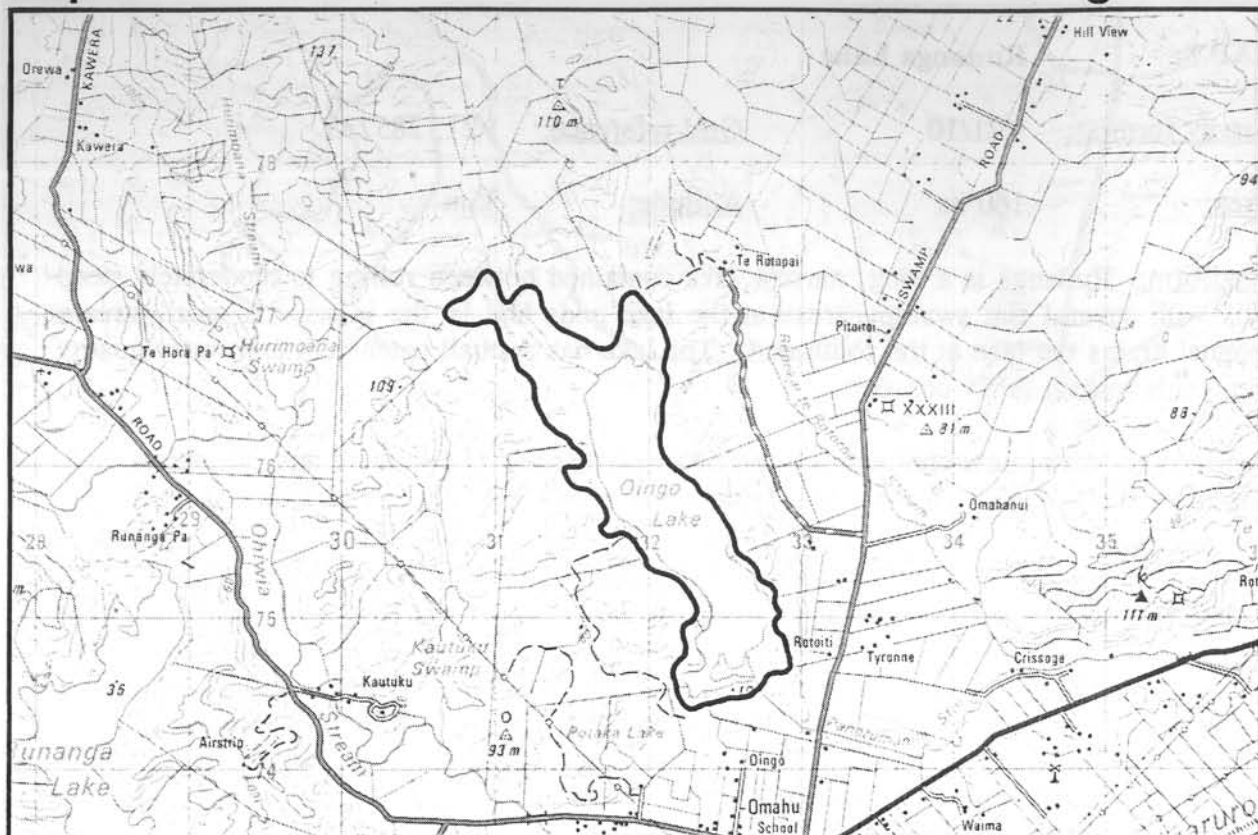
- Pussy willow is increasing in area.
- Alterations to water levels have been made in the past.
- There is a possibility of fire through the raupo (the past history of fire is unknown).
- Grazing stock have modified the marginal vegetation.

Selection criteria:

Representativeness	H	Viability	H
Diversity	H	Size and shape	H
Special features	H	Buffering	M
Naturalness	M	Fragility and threat	M

Significance: H

This large lake supports high populations of waterfowl throughout the year and is an important breeding and moulting site for these birds and for bittern and spotless crane. One of Heretaunga ecological district's best wetlands.



RAP 9: Oingo Lake

Survey form(s): V21/9

Grid reference: V21, 322755

Area: 120 ha

Altitude: 20m

Landform: A long narrow lake surrounded by rolling hill country. A large flat area at the northern end of the lake is low lying and swampy, while the southern end has a small permanent water drain.

Vegetation: A continuous band of raupo varying between 3 and 15 metres wide surrounds the lake, with areas of flax swamp in the low lying northern area. A few small pockets of mixed pussy and crack willow cover about 10% of the area of flax swamp and there are a few small raupo islands at the northern end. One plant of the locally rare species *Urtica linearifolia* was found on the eastern shore, more may be present.

Fauna: Domestic stock graze to the raupo edge. Common waterfowl are present in good numbers as well as dabchick, scaup, bittern and spotless crane. This lake is an important nesting and moulting site for waterfowl. The SSWI rating is "high" and the WERI rating is "national".

Eels are fished for commercially.

Cultural: Eight archaeological sites include pa, settlements, terraces, pits, middens and a grave are located around the lake edge.

Modifiers/Threats:

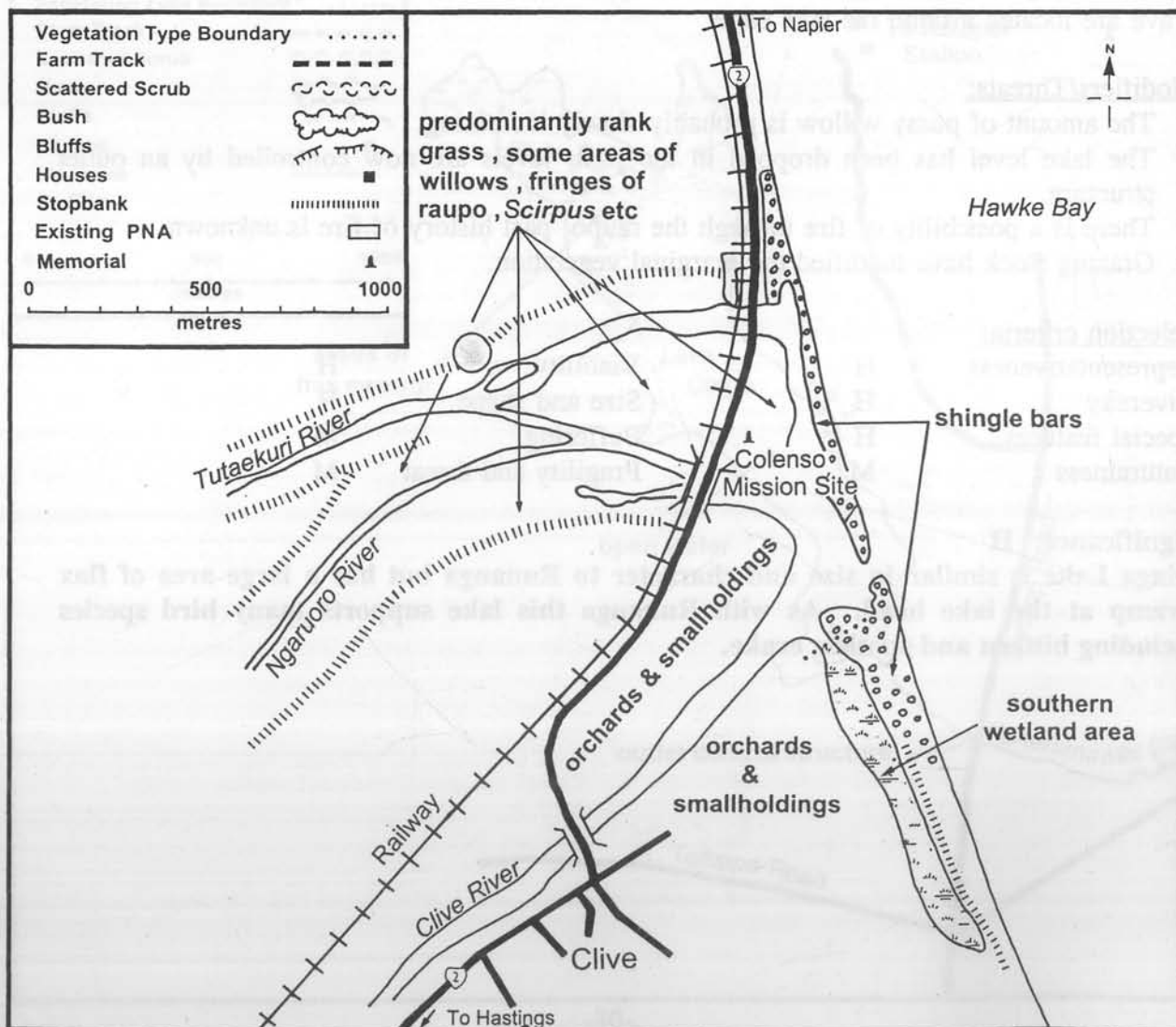
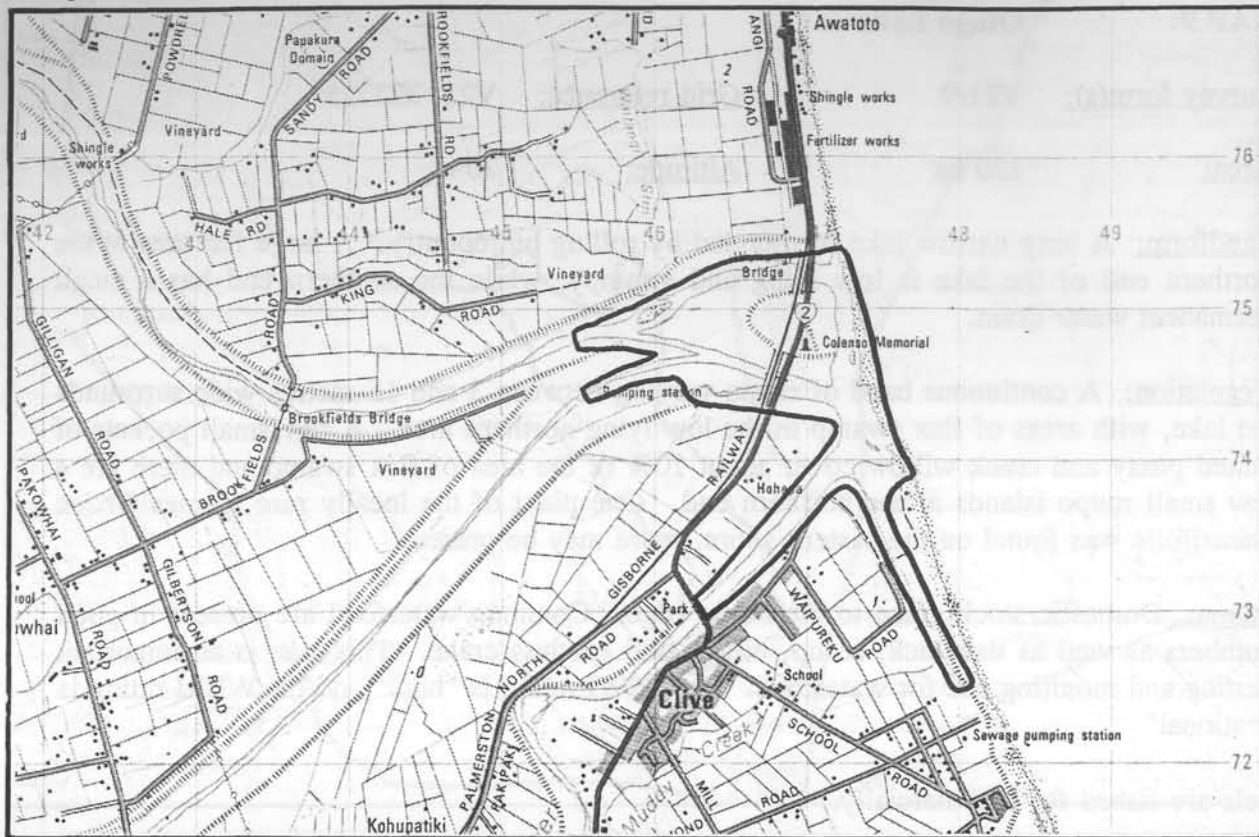
- The amount of pussy willow is probably slowly increasing.
- The lake level has been dropped in the past, levels are now controlled by an outlet structure.
- There is a possibility of fire through the raupo, past history of fire is unknown.
- Grazing stock have modified the marginal vegetation.

Selection criteria:

Representativeness	H	Viability	H
Diversity	H	Size and shape	H
Special features	H	Buffering	M
Naturalness	M	Fragility and threat	M

Significance: H

Oinga Lake is similar in size and character to Runanga but has a large area of flax swamp at the lake head. As with Runanga this lake supports many bird species including bittern and spotless crane.



RAP 10: Waitangi Estuary

Survey form(s): V21/1

Grid reference: V21, 474745

Area: 240 ha

Altitude: 0-10m

Landform: A large estuary at the common mouth of the Ngaruroro and Tutaekuri rivers. A lagoon has formed behind a changeable bar of pea size shingle. Surrounding land is flat alluvial plains.

Vegetation: Predominantly rank pasture grasses back from the waters edge with a discontinuous narrow fringe of raupo, *Bolboschoenus fluviatilis* and *Juncus spp* around the estuary edges. Most of the estuary is highly modified, the exception being the southern wetland area and a few small backwaters. Many exotic trees grow around the estuary but apart from a small area of ornamental plantings native trees are uncommon.

Fauna: Domestic stock graze some areas, rabbits and possums are present throughout, and horses and dogs are associated with human activities.

The estuary is an important nesting and feeding area for many species of wetland and coastal birds. White-fronted terns and black-billed gulls nest on the spit, white herons winter over, and bitterns and spotless crakes are present. Migrant waders occur in small numbers.

The estuary supports an important whitebait fishery and many estuarine fish species inhabit the lagoon.

Cultural: This RAP includes the site of Colenso's mission station (1844-1852). Other unrecorded European and pre-European sites are probably present also.

Modifiers/Threats:

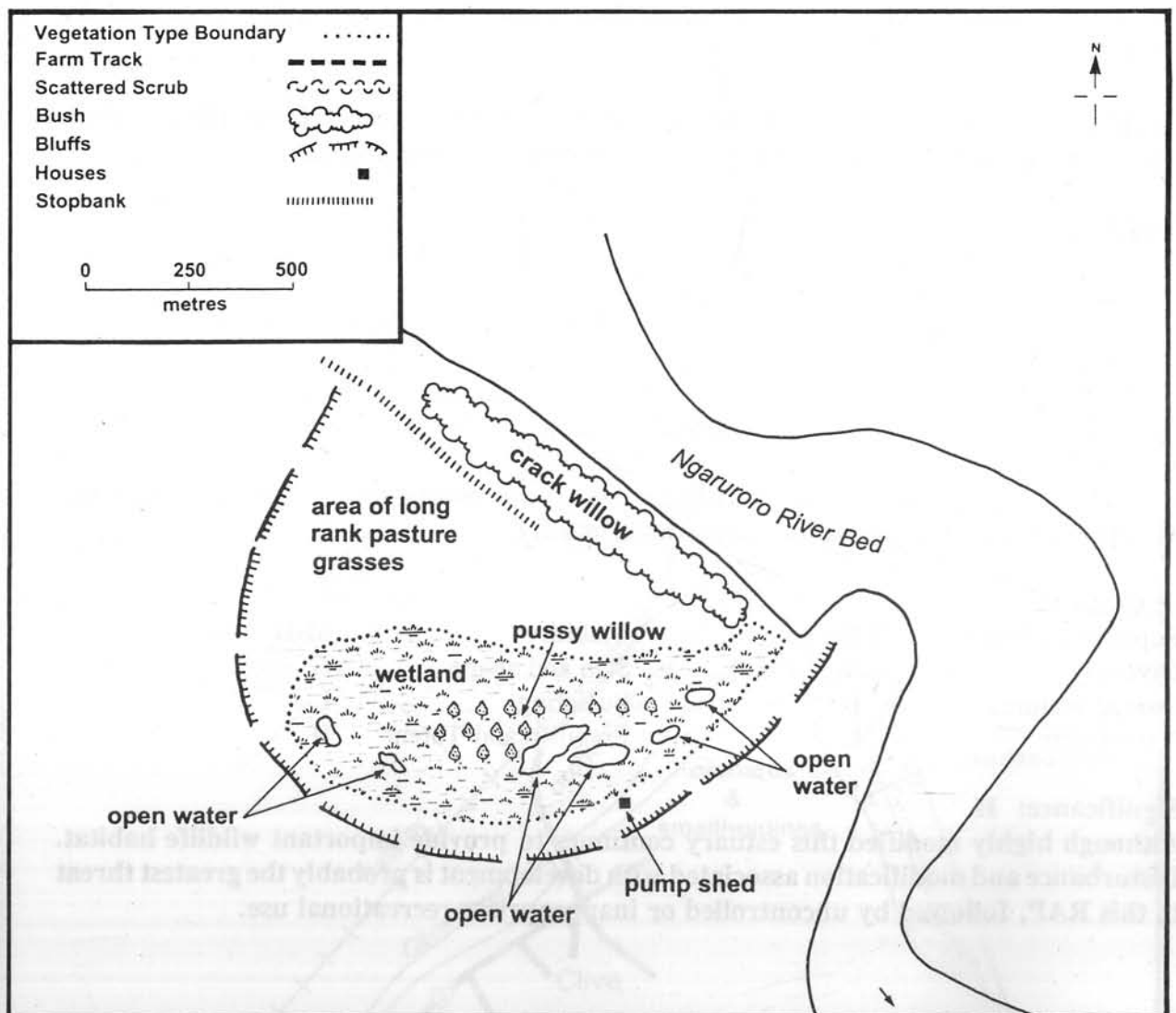
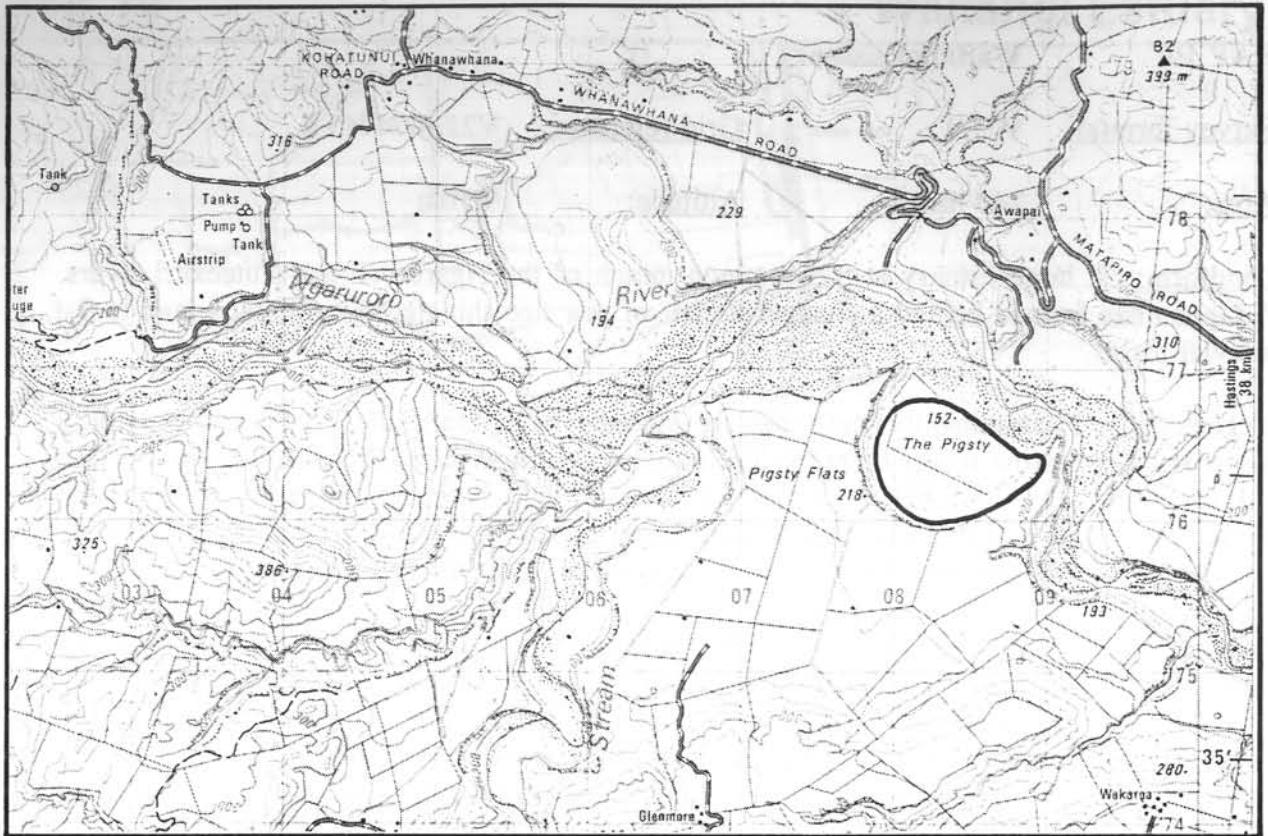
- Flooding is a regular event in the lower estuary and is caused by blocking of the river mouth by heavy seas and/or by high rainfall.
- The 1931 earthquake severely modified this area, subsequent stopbanking and river channelling followed and continues to the present day.
- Mowing, bulldozing, willow control etc is ongoing on land surrounding the estuary.
- Recreational use is very high and includes boating, fishing, picnics etc. Off road vehicles are often used for access to the river mouth.
- There is a proposal to dredge part of the estuary for rowing and water skiing activities.
- Upstream land use may affect future water quality.

Selection criteria:

Representativeness	H	Viability	M-H
Diversity	M	Size and shape	H
Special features	H	Buffering	L
Naturalness	L	Fragility and Threat	H

Significance: H

Although highly modified this estuary continues to provide important wildlife habitat. Disturbance and modification associated with development is probably the greatest threat to this RAP, followed by uncontrolled or inappropriate recreational use.



RAP 11: The Pigsty

Survey form(s): U21/1

Grid reference: U21, 084763

Area: 35 ha

Altitude: 140m

Landform: Located on a recent low terrace of the Ngaruroro river, this wetland area is surrounded for the most part by a steep semicircular escarpment. The water level of this wetland is very close to that of the Ngaruroro river and the wetland drains into the river via a narrow overgrown drain at the northeast end.

Vegetation: The Pigsty is a shallow raupo-sedge swamp comprising ~ 50% raupo and 30% *Carex secta*, with areas of pussy willow and open water making up the remainder of the area. A few kanuka, cabbage trees and flax bushes are scattered throughout the area. The swamp proper is surrounded by rank pasture grasses on the low flat areas and by scattered native plants such as mahoe, *Pittosporum ralphii*, flax, kanuka and kowhai on the steeper escarpments.

Fauna: Domestic stock graze to the swamp edge and goats were seen in the area. A wide range of waterfowl and wading birds use this wetland including bittern, spotless crane and dabchick. Fernbird has been reported. Domestic geese are very numerous in and around the wetland. Eels are abundant and are commercially fished every 4 years or so.

An SSWI rating of moderate-high is given to the Pigsty and it has a WERI rating of regional.

Cultural: No archaeological sites are recorded.

Modifiers/Threats:

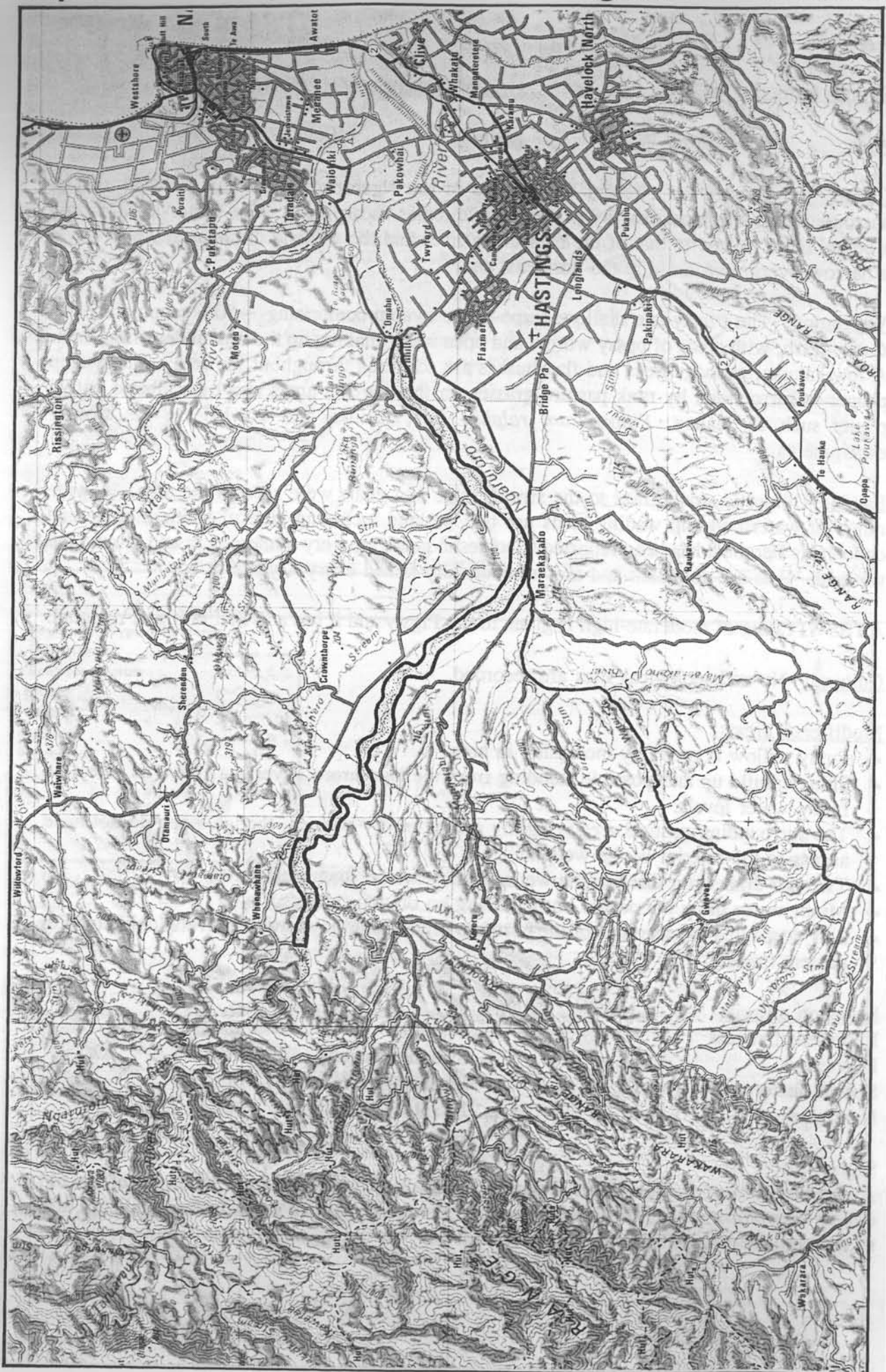
- Pussy willow is probably increasing in area.
- Shingle build up and possible flooding from the Ngaruroro River may have an effect on future water levels.
- The surrounding pasture area is lightly grazed in dry periods, though stock do not have access to the interior of the wetland.
- Two old drains run through the wetland, they are no longer effective.
- Minor water draw off occurs but is having no obvious effects.
- Any deepening or clearance of the northern drain would lower water levels (unlikely with present owner).

Selection criteria:

Representativeness	H	Viability	M-H
Diversity	M	Size and shape	M-H
Special features	H	Buffering	M
Naturalness	M	Fragility and Threat	M

Significance: H

A combination of a high quality wetland contained within a good example of an old oxbow formation makes this RAP unusual. Fernbird, bittern and spotless crane all add to the significance of this valuable wetland.



RAP 12: Ngaruroro Riverbed

Survey form(s): V21/11 Grid reference: U21, 040771 to V21, 320729

Area: ~ 1500 ha Altitude: 30-170m

Landform: Between Whanawhana and Fernhill the Ngaruroro River occupies a wide and unstable riverbed of sands and gravels, backed by broad terraces of varying heights and by low hills. Floods often cover the shingle bed and the river channels are subject to frequent change.

Vegetation: This RAP is dominated by exotic vegetation. The shingle riverbed is for the most part sparsely covered in annual weeds and grasses, with a few areas of lupin on more stable areas. The higher river flats have many areas of gorse and above the Mangatahi Stream kanuka grows on a few of the terraces. Mature willows and silver poplars fringe the river for most of the distance below the Mangatahi Stream to Fernhill and in places have formed islands of willow in the shingle riverbed. Exotic weed species are widespread over the full length of the RAP, the most common being gorse, blackberry, *Clematis vitalba* and buddleja.

Fauna: Rabbits, possums and hares are present throughout the RAP. Parts of the riverbed and adjacent low terraces and flats are grazed by cattle and sheep.

The open braided sections of river provide important habitat for many species of birds but are particularly important for two species, the black fronted dotterel and the banded dotterel, both dependant on wide shingle riverbeds for breeding. South Island pied oystercatchers have been recorded as breeding and other commonly seen birds are pied stilt, black-backed gull, paradise shelduck and spur-winged plover. An SSWI rating of high is given to this RAP.

Modifiers/Threats:

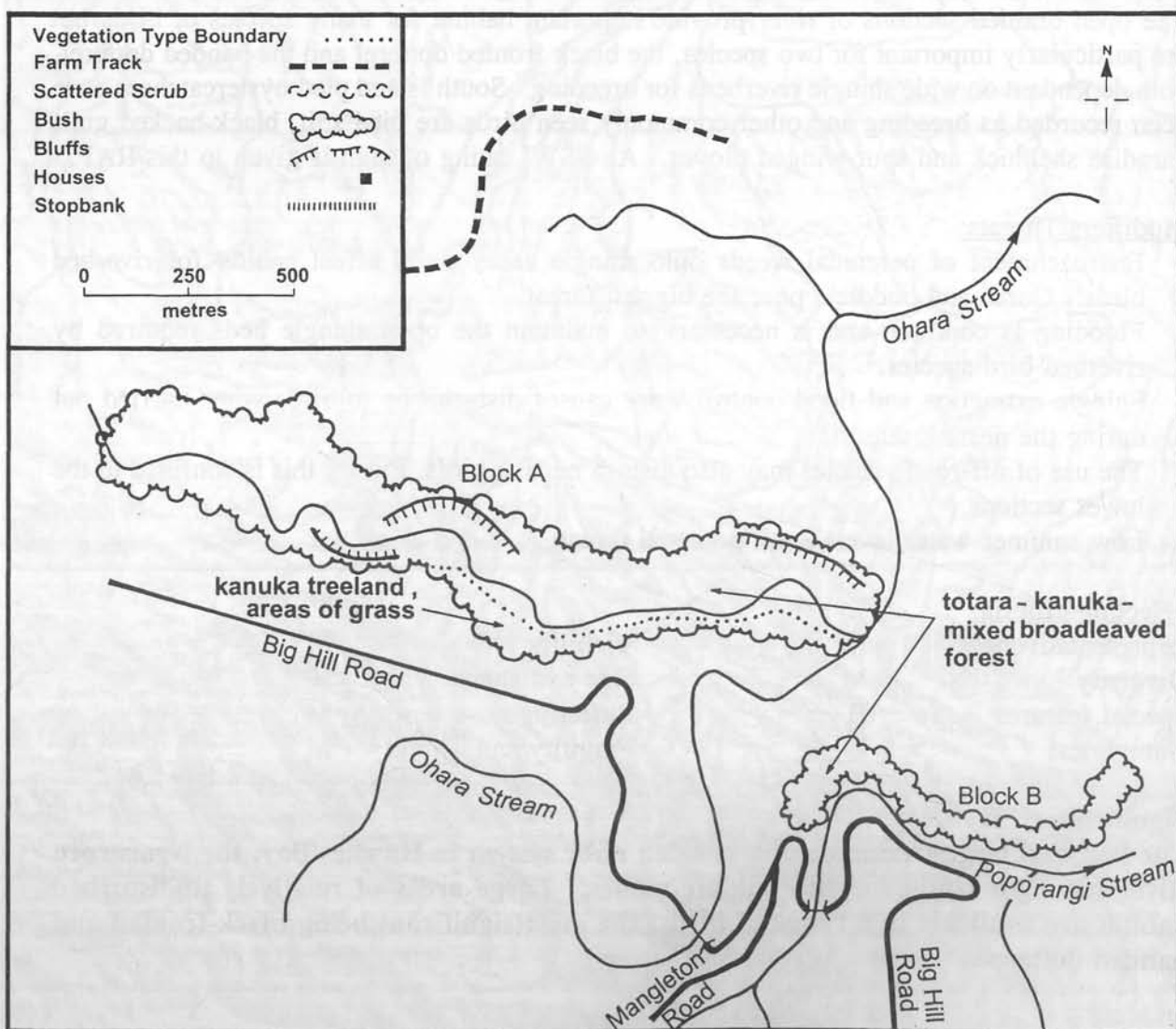
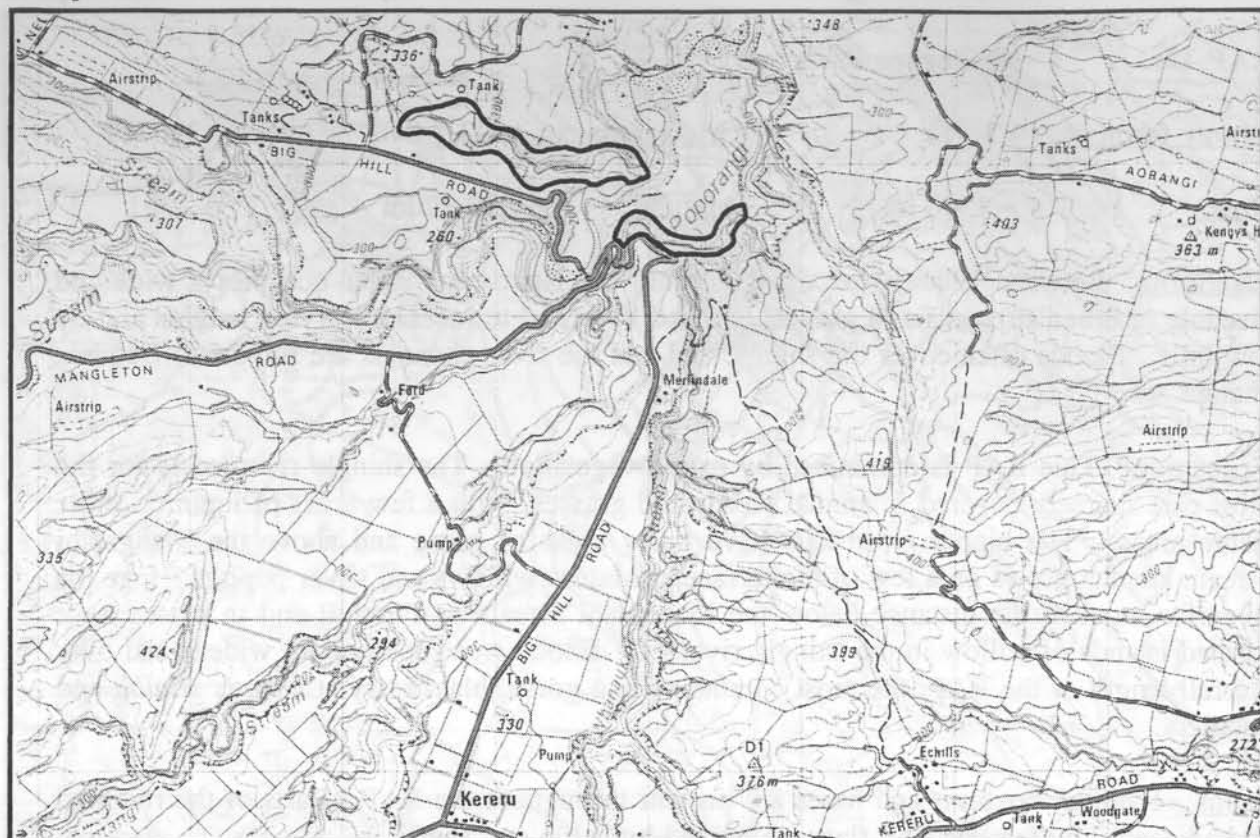
- Encroachment of perennial weeds onto shingle areas could affect habitat for riverbed birds. Gorse and buddleja pose the biggest threat.
- Flooding is common and is necessary to maintain the open shingle beds required by riverbed bird species.
- Shingle extraction and flood control work causes disturbance to birds when carried out during the nesting season.
- The use of off-road vehicles may also disturb nesting birds, mostly this is confined to the lower sections.
- Low summer water levels are a potential threat.

Selection criteria:

Representativeness	H	Viability	M
Diversity	M	Size and shape	H
Special features	H	Buffering	M
Naturalness	L	Fragility and Threat	M

Significance: H

The best and largest example of a braided river system in Hawkes Bay, the Ngaruroro River has high landscape and wildlife values. Large areas of relatively undisturbed habitat are available to a range of birds, the most significant being black-fronted and banded dotterels.



RAP 13: Ohara

Survey form(s): U21/5

Grid reference: U21, 041731

Area: 41 ha

Altitude: 200-320m

Landform: RAP 13 is in two blocks, the first is located in a steep sided gully running into the Ohara Stream and the second is a steep face above the Poporangi Stream. Both have some very steep faces and bluffs on the upper slopes directly below the gully rim and are surrounded by high flat terraces.

Vegetation: Totara-kanuka-mixed broadleaved forest. This unusual forest type is made up of predominantly 20-30cm DBH totara, often emerging through a canopy of kanuka and broadleaved tree species approximately 10-16m tall. Near the stream in block A are a few large kahikatea and totara up to ~ 1.25m DBH but no large trees were seen elsewhere in the RAP. Mostly the canopy is closed but parts of the true right side of the gully in block A have areas of open kanuka and small grassy faces. On the easier slopes the understory is sparse to moderate and comprises mainly rangiora, tree nettle and ferns while the steeper areas have a dense understory of similar composition.

Fauna: Goats are present in this area and signs of domestic stock were seen in area A.

Cultural: No archaeological sites are recorded.

Modifiers/Threats:

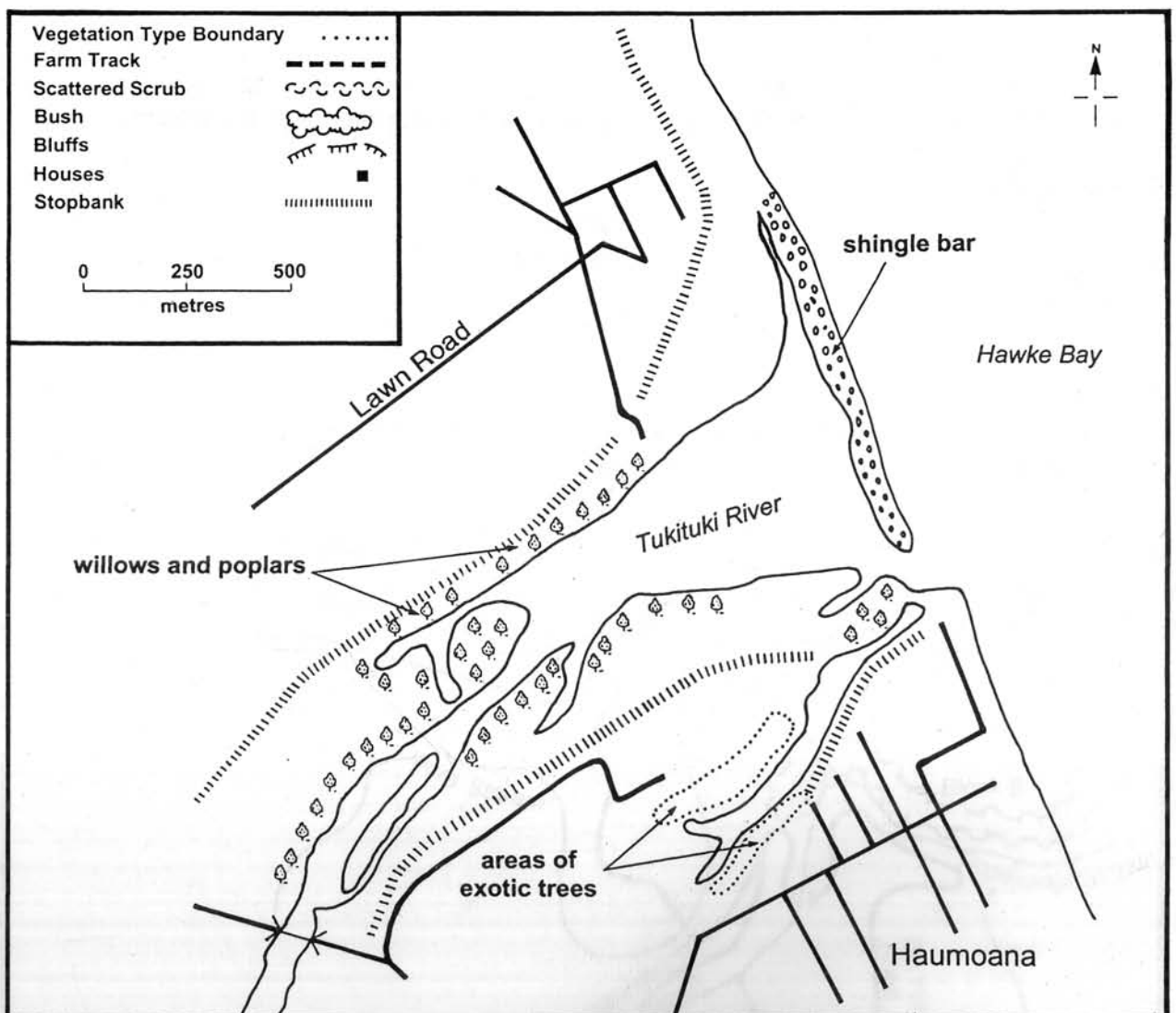
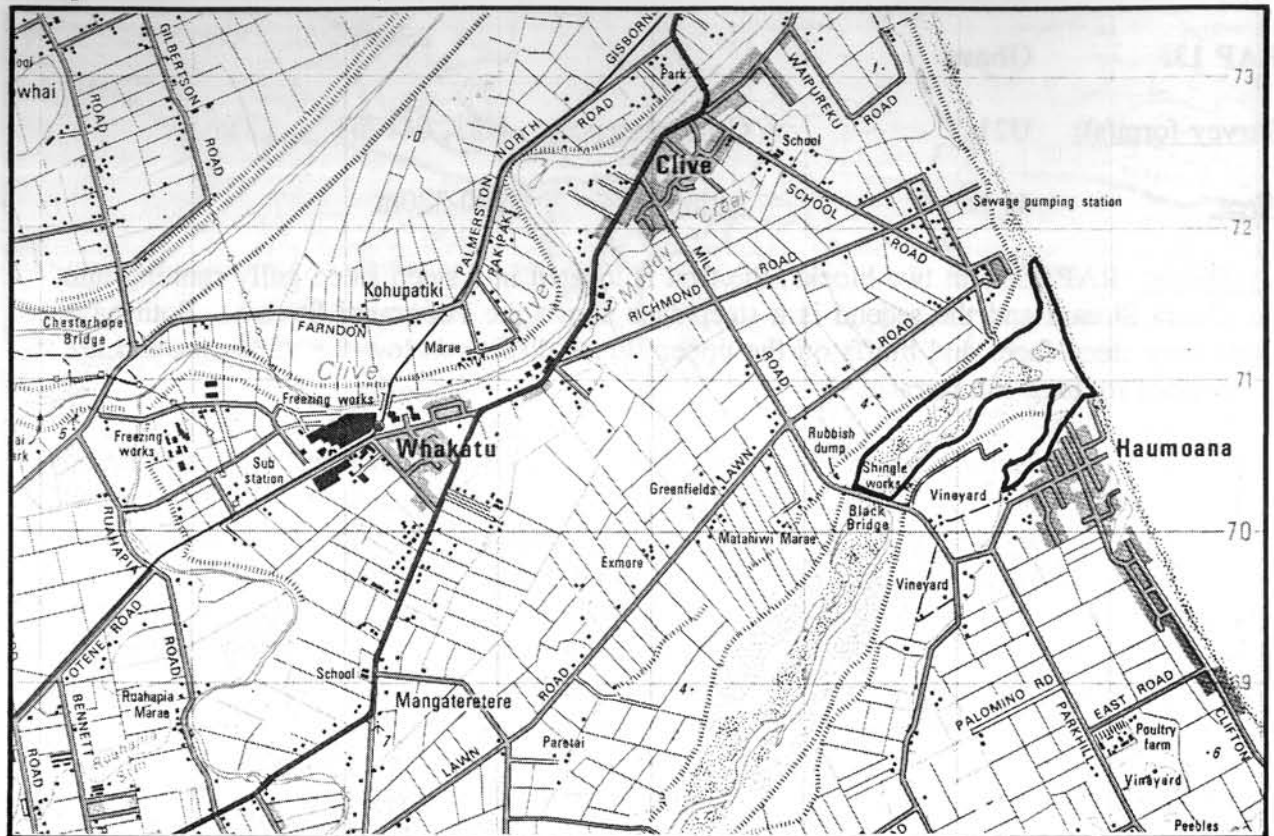
- A few small gorse pockets are present, gorse is abundant on surrounding land.
- Goats and stock are affecting the understory of area A, especially near the stream.

Selection criteria:

Representativeness	H	Viability	H
Diversity	M	Size and shape	M
Special features	M	Buffering	M
Naturalness	H	Fragility and Threat	L

Significance: M

This forest type of evenly mixed totara-kanuka-broadleaved trees is unusual and was not found elsewhere in the Heretaunga ecological district.



RAP 14: Tukituki Estuary

Survey form(s): V21/2

Grid reference: V21, 485712

Area: 43 ha

Altitude: 0-5m

Landform: This is a moderate sized estuary with several inlets and backwaters, surrounded by flat, low-lying alluvial plain. As with the Waitangi Estuary a lagoon has formed behind a changeable seaward bar of pea size shingle.

Vegetation: The open water of the lagoon area is surrounded by exotic plant species, predominantly rank pasture grasses backed by treelands of silver poplar and willows, but with areas of blackberry and fennel also common. In contrast the backwaters contain extensive beds of *Bolboschoenus fluviatilis* (40%) and raupo (10%), with open water making up the remainder of the backwater area. These backwaters and inlets are backed by treelands of a variety of exotic species as well as a few ngaio and taupata. Occasional shrubs of saltmarsh ribbonwood are present around these backwaters. The shingle bar is almost devoid of vegetation, supporting only a few low growing coastal plants.

Fauna: Rabbits and a few possums are present, as well as visiting domestic cats and dogs from nearby houses.

The estuary contains high numbers of gulls, terns and shags and supports smaller numbers of wading birds. Bittern and spotless crane are present in the backwaters and white heron winter over. Commoner waterfowl use the backwaters as feeding and resting areas.

Many estuarine fish species are found in the lagoon and an important local whitebait and smelt fishery is based on this river. An SSWI rating of moderate-high is given to this RAP.

Modifiers/Threats:

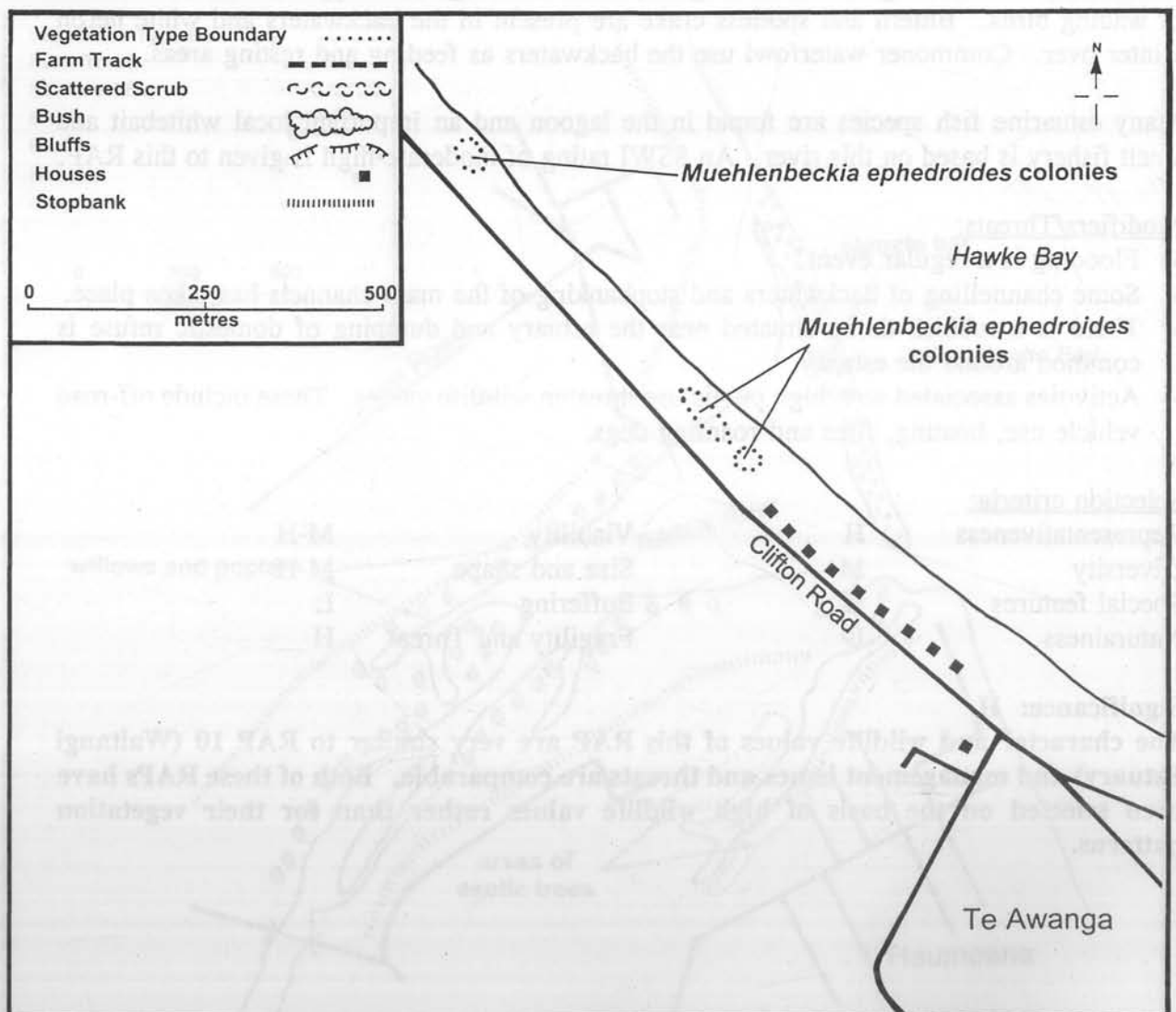
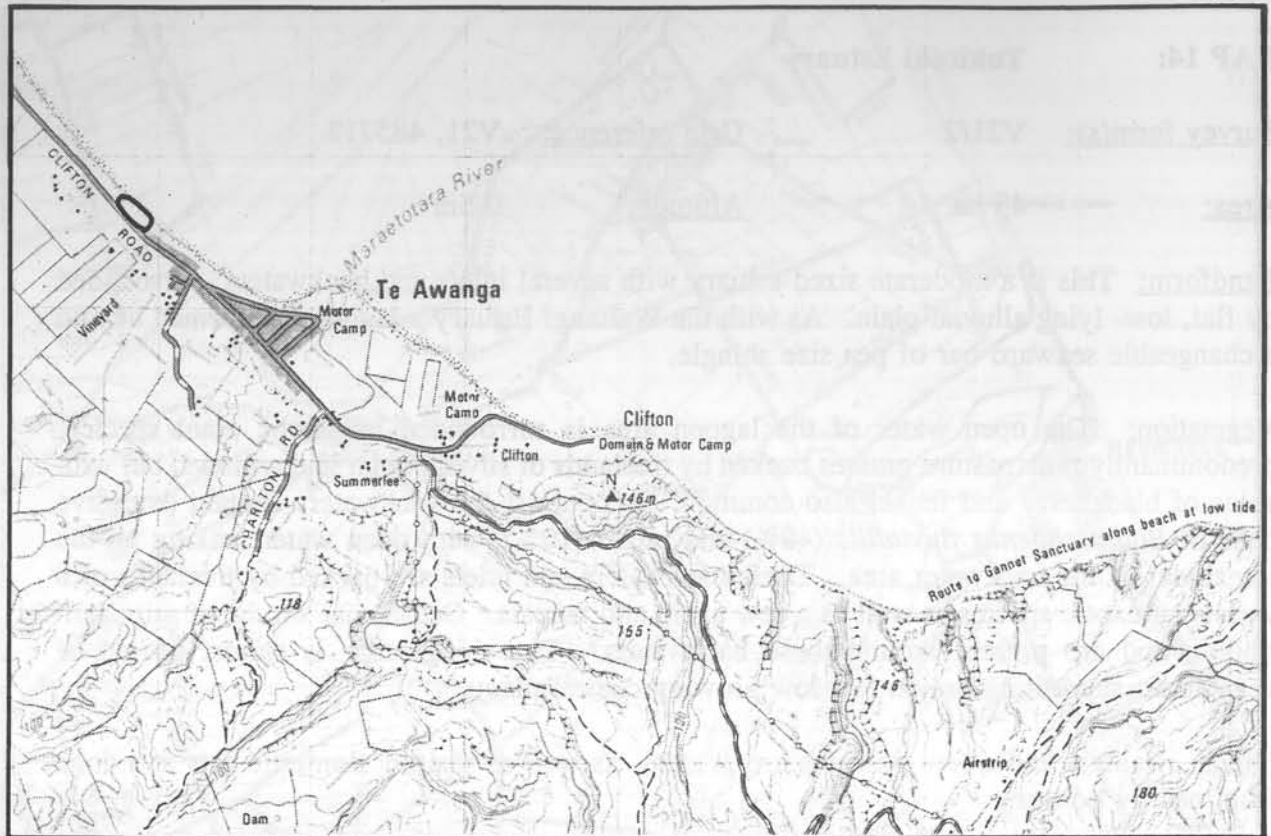
- Flooding is a regular event.
- Some channelling of backwaters and stopbanking of the main channels has taken place.
- There is a rubbish dump situated near the estuary and dumping of domestic refuse is common around the estuary.
- Activities associated with high public use threaten wildlife values. These include off-road vehicle use, boating, fires and roaming dogs.

Selection criteria:

Representativeness	H	Viability	M-H
Diversity	M	Size and shape	M-H
Special features	H	Buffering	L
Naturalness	L	Fragility and Threat	H

Significance: H

The character and wildlife values of this RAP are very similar to RAP 10 (Waitangi Estuary) and management issues and threats are comparable. Both of these RAPs have been selected on the basis of high wildlife values rather than for their vegetation patterns.



RAP 15: Te Awanga

Survey form(s): W21/2 Grid reference: W21 507677
Area: c.5 ha Altitude: c.5m

Landform: This small RAP consists of a narrow strip along the shore, just above the storm strand zone, on a beach of gravel and rounded flattish pebbles. Although on stable flattish land, this site is heavily influenced by its proximity to the sea.

Vegetation: The gravel and pebbles are patchily clothed in prostrate exotic herbs (escapes from flower gardens and deliberate introductions including ice plant, evening primrose, alyssum, arctotis and spur valerian) and two native vines: *Muehlenbeckia ephedroides* and *M.complexa*. It is the *M.ephedroides* that makes the site significant: it is listed as nationally threatened, and its occurrence at Te Awanga, where it forms a small population of plants that look like discarded wire, is the only one known in Hawke's Bay.

Fauna: A range of native invertebrates typical of stony dry shores is present. So too are common skinks. Shore and land birds visit the site, but none are known to breed there.

Cultural: This shore is close to a coastal settlement and is much used for picnicking, walking, dog exercise and driftwood-gathering.

Modifiers/Threats:

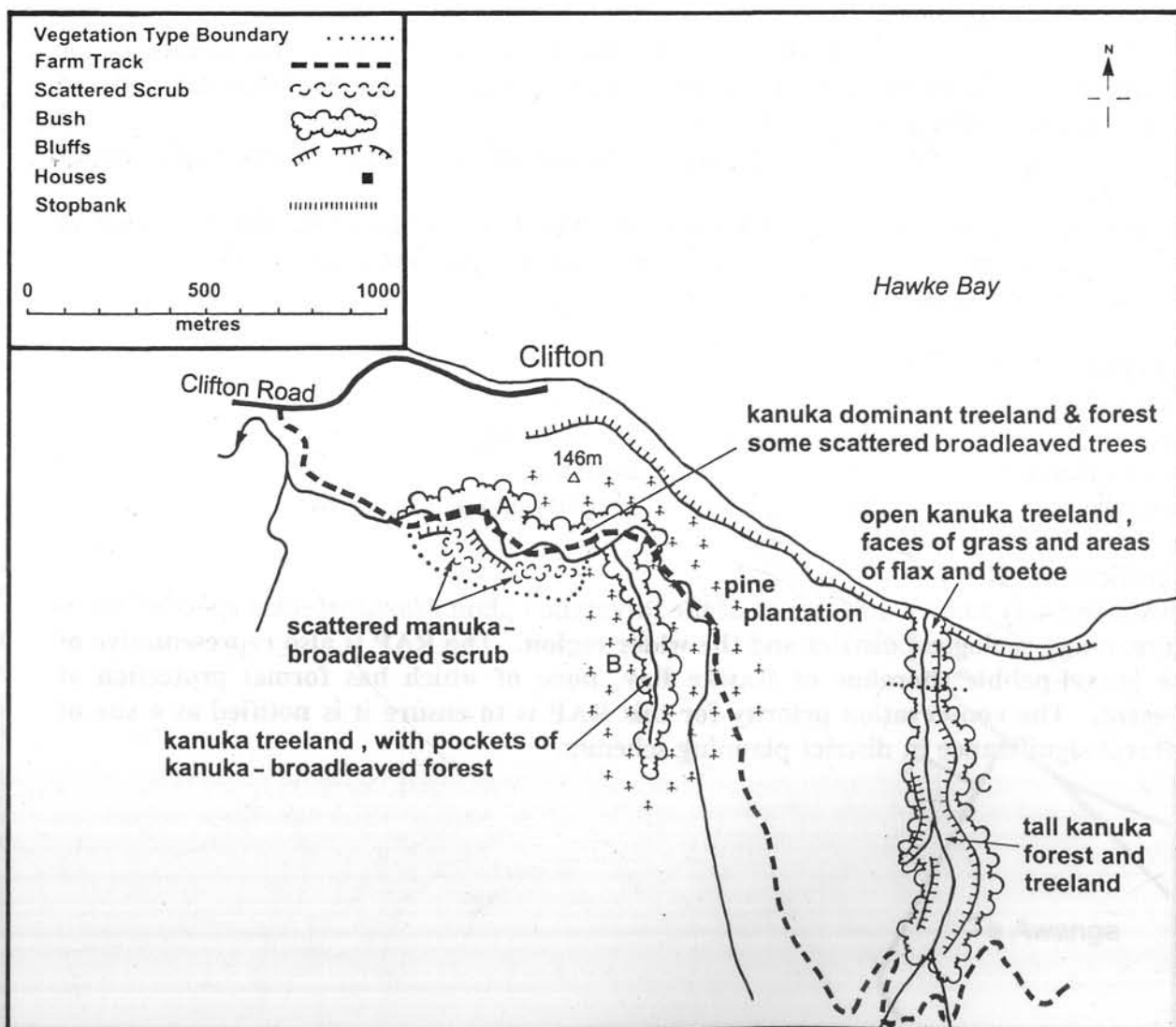
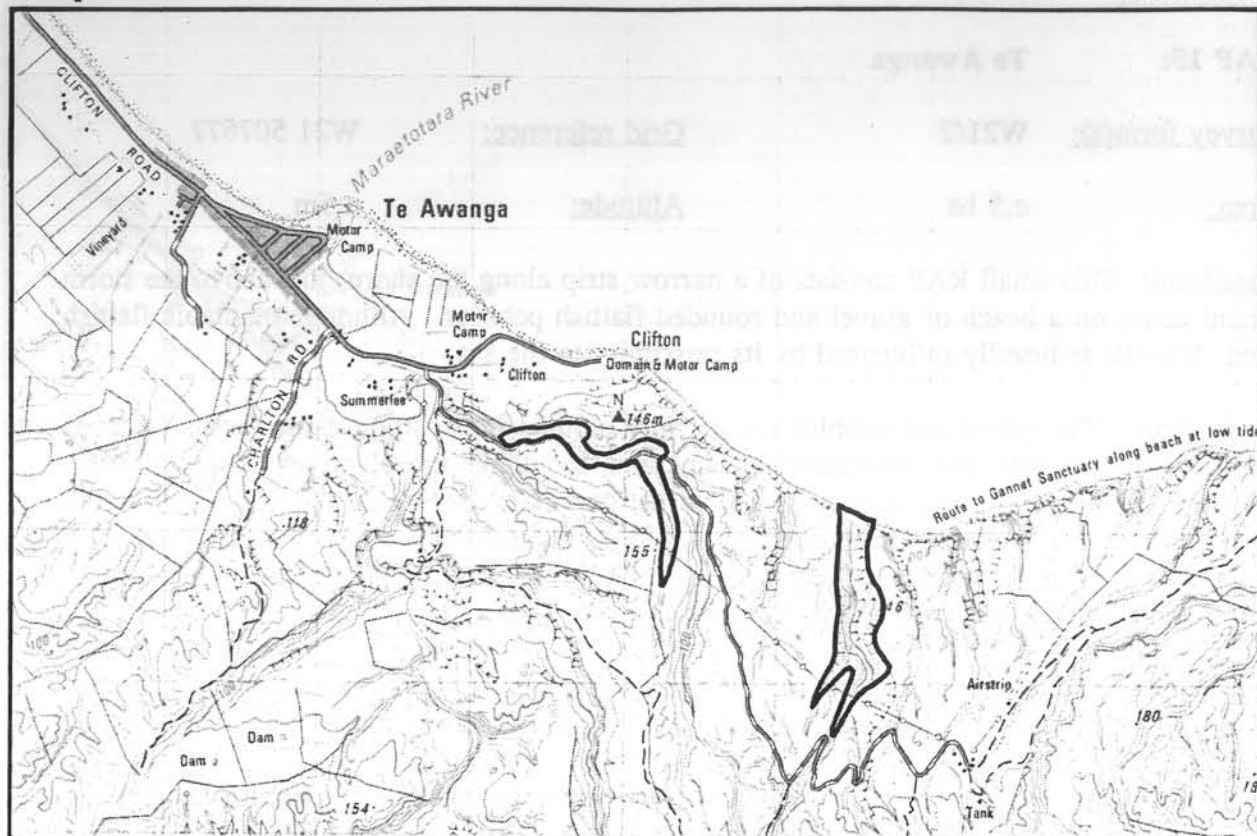
- The greatest threat is posed by potential coastal development: either for housing or for recreation. In recent years much such shore in Hawke's Bay has been flattened and grassed for public use.
- Vehicles are occasionally driven through the site and over *Muehlenbeckia ephedroides* plants.
- Should the garden escapes and deliberately introduced exotic shore plants increase in dominance, the *M.ephedroides* might be squeezed out: judicious weeding would be required to maintain it.

Selection criteria:

Representativeness	H	Viability	M
Diversity	L	Size and shape	L
Special features	H	Buffering	L
Naturalness	M	Fragility and Threat	M

Significance: H

This is the only known occurrence of the threatened plant *Muehlenbeckia ephedroides* in Heretaunga ecological district and the wider region. The RAP is also representative of the gravel-pebble shoreline of Hawke Bay, none of which has formal protection at present. The conservation priority for this RAP is to ensure it is notified as a site of natural significance in district planning schemes.



RAP 16: Clifton

Survey form(s): W21/1

Grid reference: W21, 535655

Area: 56 ha

Altitude: 20-180m

Landform: This RAP consists of 3 areas, two steep entrenched dry stream gullies and a steep face. The eastern and larger gully drains north into the sea through a break in the coastal cliffs and the other into a usually dry stream bed flowing out to the Maraetotara River. Steep faces and small gravel bluffs characterise all 3 areas and deep gravels underlie all of this RAP.

Vegetation: Kanuka treeland and forest. In all 3 areas kanuka is the dominant tree species and generally ranges from 15-30cm DBH and up to ~15m tall. Karaka, titoki, kowhai, mahoe and *Pittosporum ralphii* are common on the lower slopes and in the gullies of areas A and B and make up ~20% of the canopy. Broadleaved trees are less common in area C with no karaka or titoki being seen. Areas of open grassland and steep, stony faces make up about 30% of areas A and B, while area C has a more closed canopy except at the gully mouth, which contains scattered kanuka, flax, ferns and toetoe on steep grassy faces.

The understory is mostly sparse throughout and includes *Helichrysum lanceolatum*, *Coprosma rhamnoides*, tree nettle, kawakawa and ferns.

Fauna: Goats are present in moderate numbers, rabbits and possums are common and domestic stock range throughout except on steep and inaccessible faces.

Common bush and pasture birds use these areas and a migratory population of pied tit is reported from block C, being present only in winter. Common skinks are present.

Cultural: Eleven archaeological sites are recorded in or close to these areas. These are pa, house sites and pits.

Modifiers/Threats:

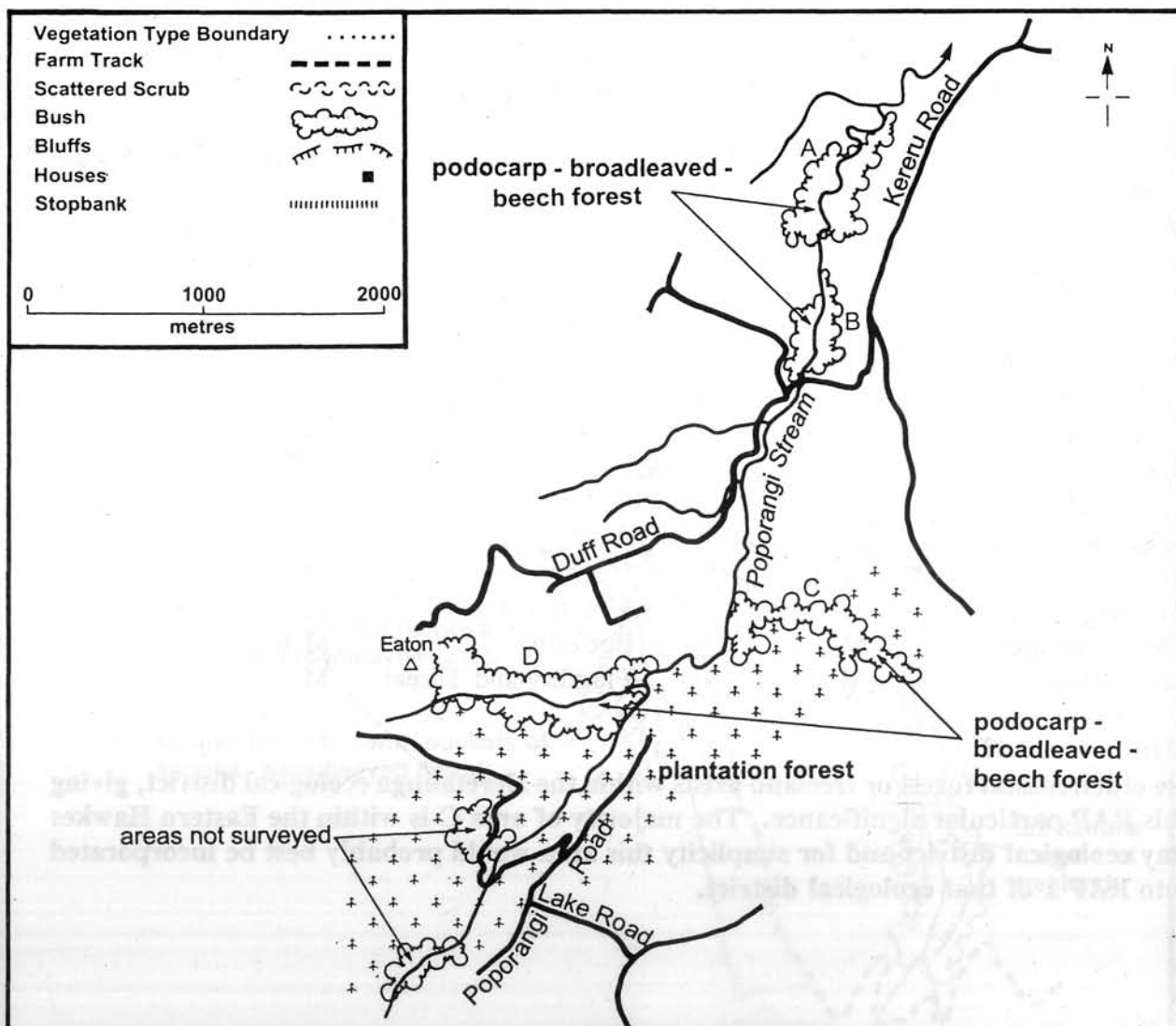
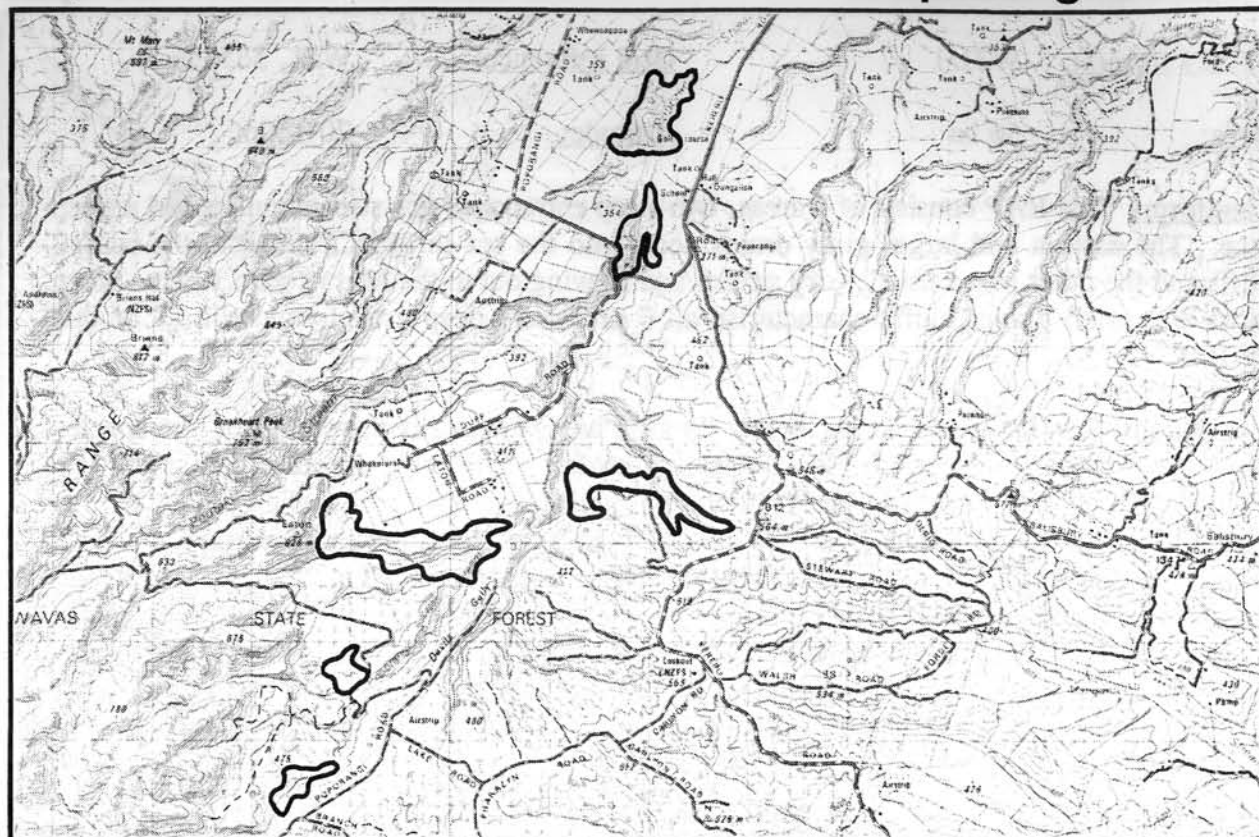
- Seeding from surrounding pine plantations is a possible future threat.
- There is much natural erosion of steep faces and gullies by water action.
- The risk of fire is fairly high during dry summer conditions.
- Some kanuka has been removed for firewood, most remaining areas are probably too steep for commercial harvest.
- All areas are grazed by goats, sheep and cattle.

Selection criteria:

Representativeness	M	Viability	M
Diversity	M	Size and shape	M
Special features	M	Buffering	M-H
Naturalness	M	Fragility and Threat	M

Significance: H

No other coastal forest or treeland exists within the Heretaunga ecological district, giving this RAP particular significance. The majority of area C is within the Eastern Hawkes Bay ecological district and for simplicity this area would probably best be incorporated into RAP 1 of that ecological district.



RAP 17: Poporangi Stream

<u>Survey form(s):</u>	Area A: U21/7	<u>Grid reference:</u>	U21, 020672
	Area B: U21/7		U21, 019660
	Area C: U21/3		U21, 015635
	Area D: U21/6		U21, 998628

Area: ~ 190 ha Altitude: 260-500m

Landform: All areas are located in or adjacent to the broad stream gully of the Poporangi Stream and mostly comprise moderate to steep faces, broken in places by steep bluffs.

Vegetation: Podocarp-broadleaved-beech forest. Totara is the dominant podocarp tree but there are also good numbers of matai and kahikatea. Rimu is uncommon. Titoki, mahoe, kowhai, lacebark, lemonwood, marbleleaf, rewarewa, mapou and kohuhu are all common and make up large areas of a variable height canopy. Black beech is found in pockets throughout all areas on the drier faces and ridges. In areas inaccessible to stock (areas C and D), the understory is moderate to dense and has a wide diversity of trees, shrubs and climbers while those areas open to stock (areas A and B) have a less dense understory with fewer species. The overall impressions of this RAP are of a diverse number of plant species and a healthy forest canopy cover.

Fauna: Feral deer and pigs are scattered thinly through the area and possums in varying numbers are found throughout. Stock have access to areas A and B. Common bush birds are present in good numbers.

Cultural: Area D contains an old pa site which is a registered archaeological site.

Modifiers/Threats:

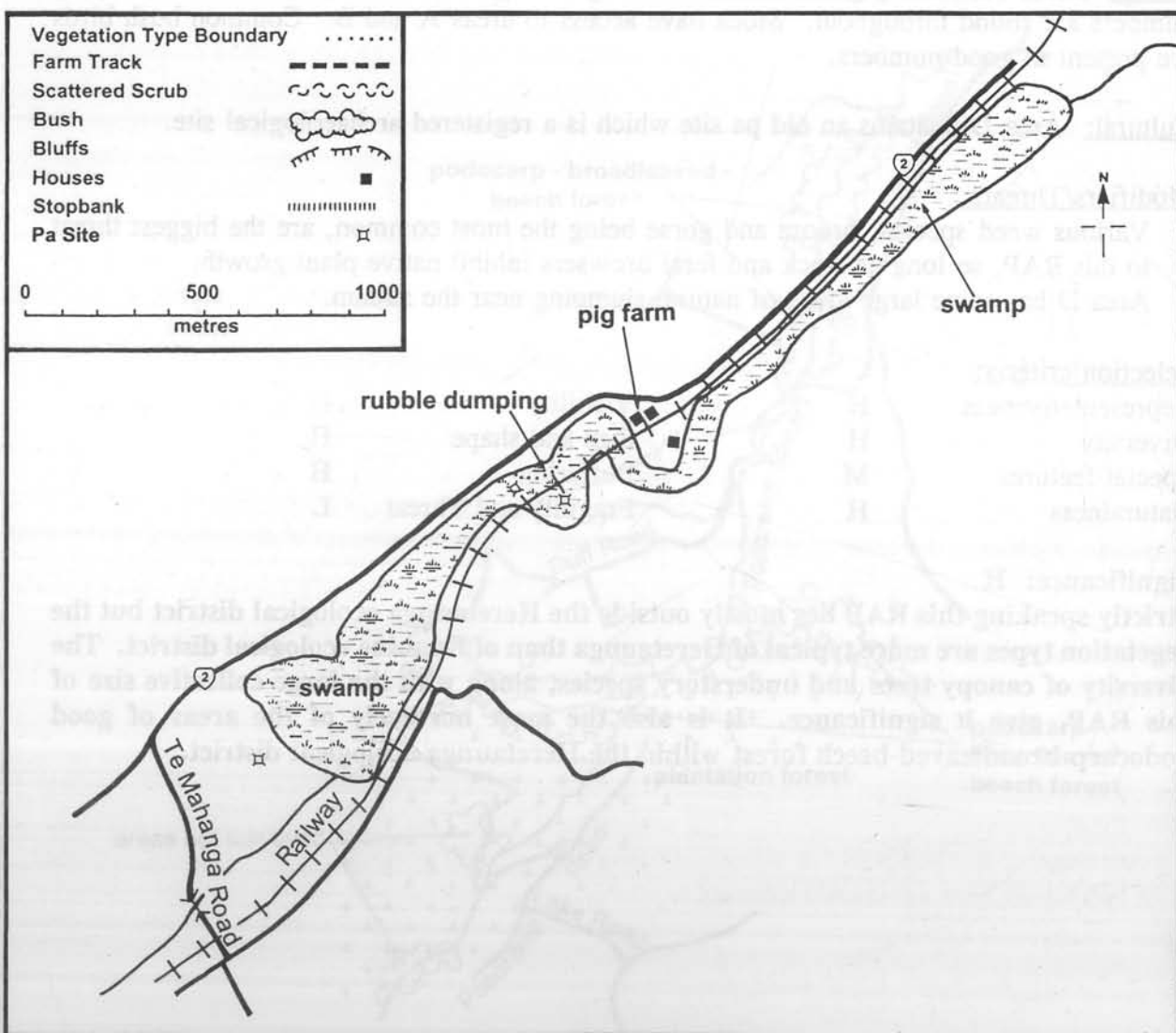
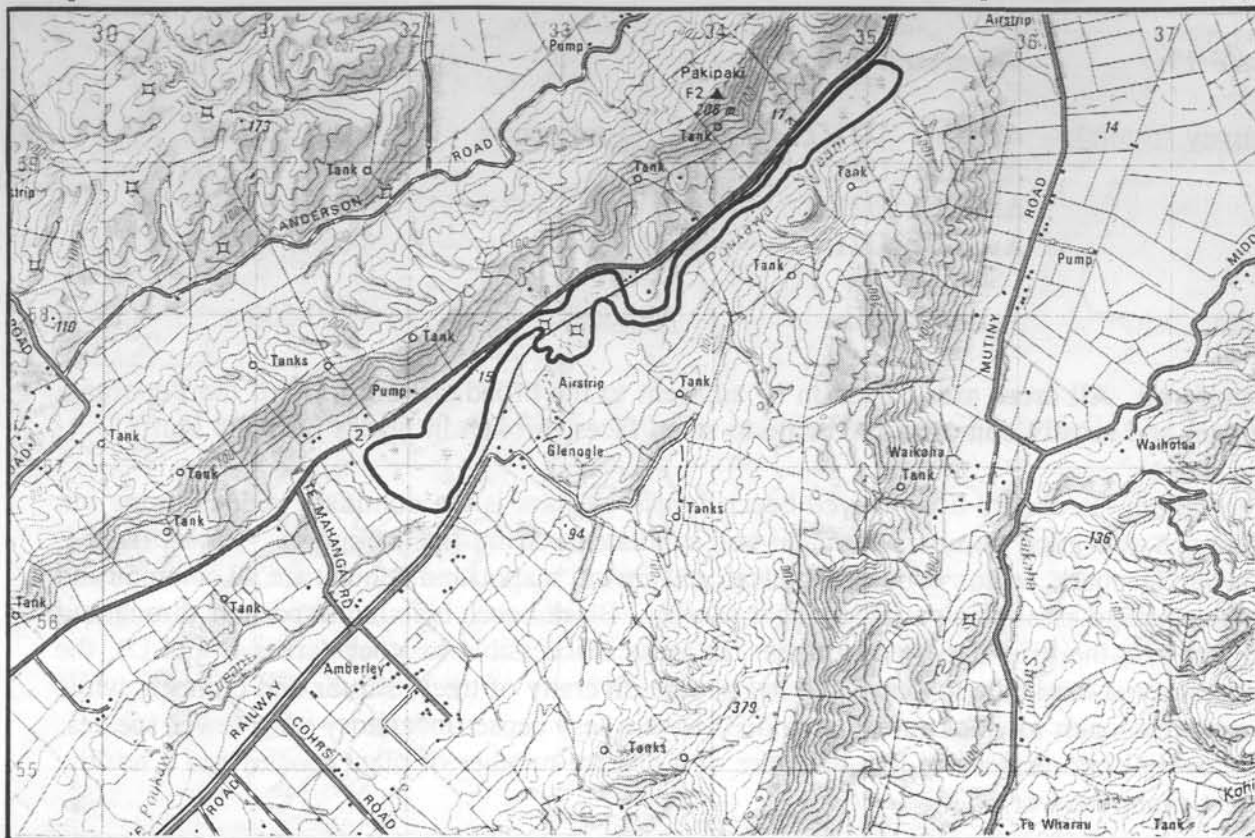
- Various weed species, broom and gorse being the most common, are the biggest threat to this RAP, so long as stock and feral browsers inhibit native plant growth.
- Area D has some large areas of natural slumping near the stream.

Selection criteria:

Representativeness	H	Viability	H
Diversity	H	Size and shape	H
Special features	M	Buffering	H
Naturalness	H	Fragility and Threat	L

Significance: H

Strictly speaking this RAP lies mostly outside the Heretaunga ecological district but the vegetation types are more typical of Heretaunga than of Ruahine ecological district. The diversity of canopy trees and understory species, along with the large collective size of this RAP, give it significance. It is also the most northerly of the areas of good podocarp-broadleaved-beech forest within the Heretaunga ecological district.



RAP 18: Pekapeka Swamp

Survey form(s): V22/1

Grid reference: V22, 323573

Area: 50 ha

Altitude: 10m

Landform: Fed by the catchment of the Poukawa basin, Pekapeka Swamp is a long narrow wetland squeezed between the Raukawa and Kaokaoroa ranges. These two ranges are of Te Mata limestone while the swamp itself has a base of peat. The Poukawa Stream flows through the wetland from southwest to northeast.

Vegetation: Pekapeka swamp is a willow dominant/raupo wetland. Mature pussy and crack willow extend over most of the swamp and form a dense canopy at the southern end, while weeping willow grows around the fringes. To the north raupo covers ~30% of the area and a few open water ponds have been cleared for waterfowl shooting. Submerged and semi emergent plants such as curled pond weed (*Potamogeton crispus*), watercress, willow weed, starwort (*Callitriche stagnalis*) and cape pond weed (*Aponogeton distachyus*) grow in the waterways and around the margins of the swamp while further back blackberry, hemlock, fennel, rank pasture grasses and annual weeds are found.

Fauna: Possums inhabit the willow and most of the eastern side is grazed by stock. Pekapeka Swamp provides nesting and feeding habitat for a wide variety of waterfowl and lesser numbers of waders including threatened species such as bittern, spotless crane, marsh crane and dabchick.

Long and short finned eels, inanga, common bully and goldfish have been recorded from the Poukawa Stream and in all probability inhabit the swamp. A WERI status of regional and an SSWI rating of moderate-high is given to Pekapeka.

Cultural: Both Pekapeka Swamp and Lake Poukawa (RAP 23) are historically important, many defended pa were located on surrounding hills and abundant food resources were gathered from the wetlands. Seven archaeological sites are recorded locally.

Modifiers/Threats:

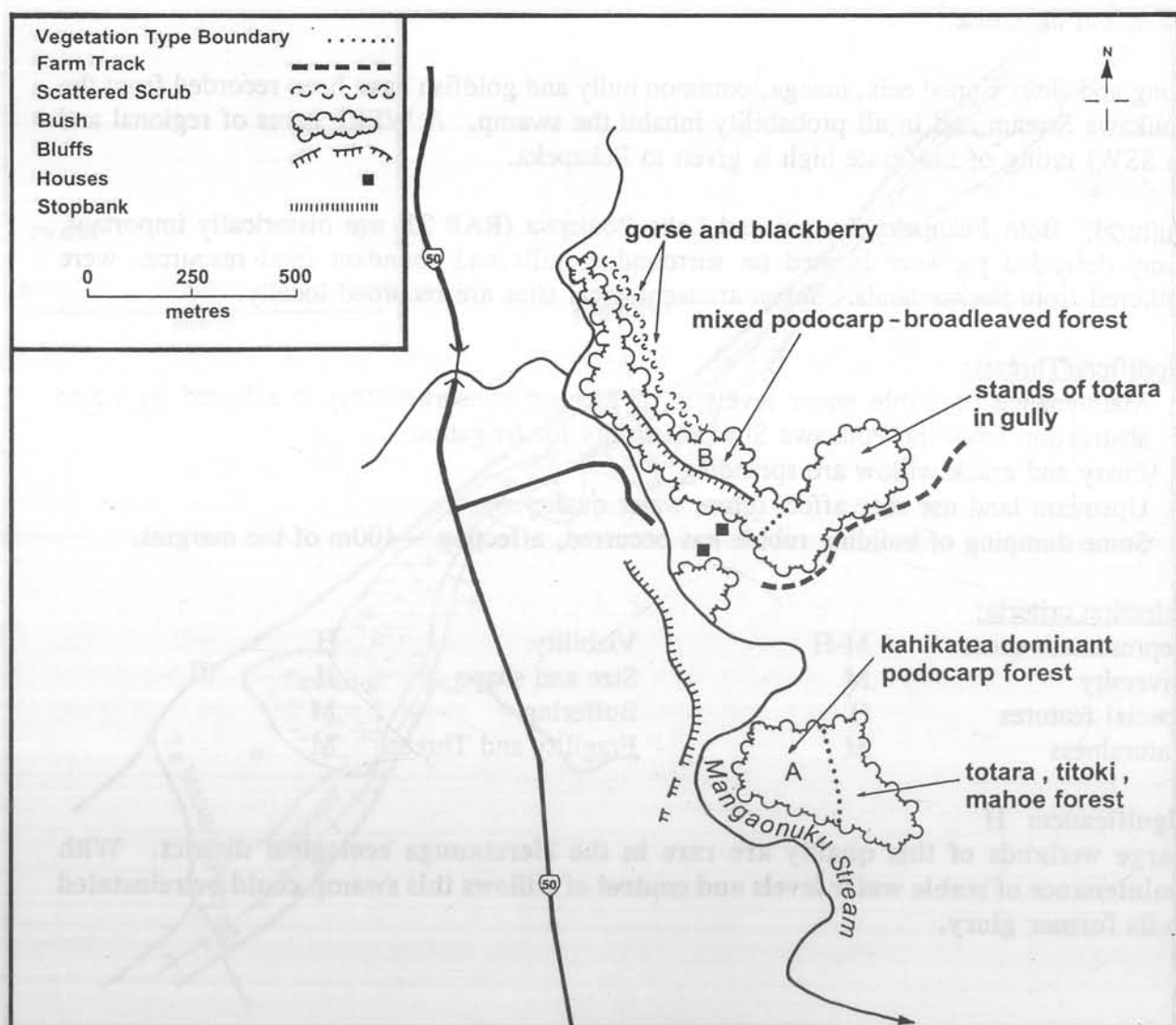
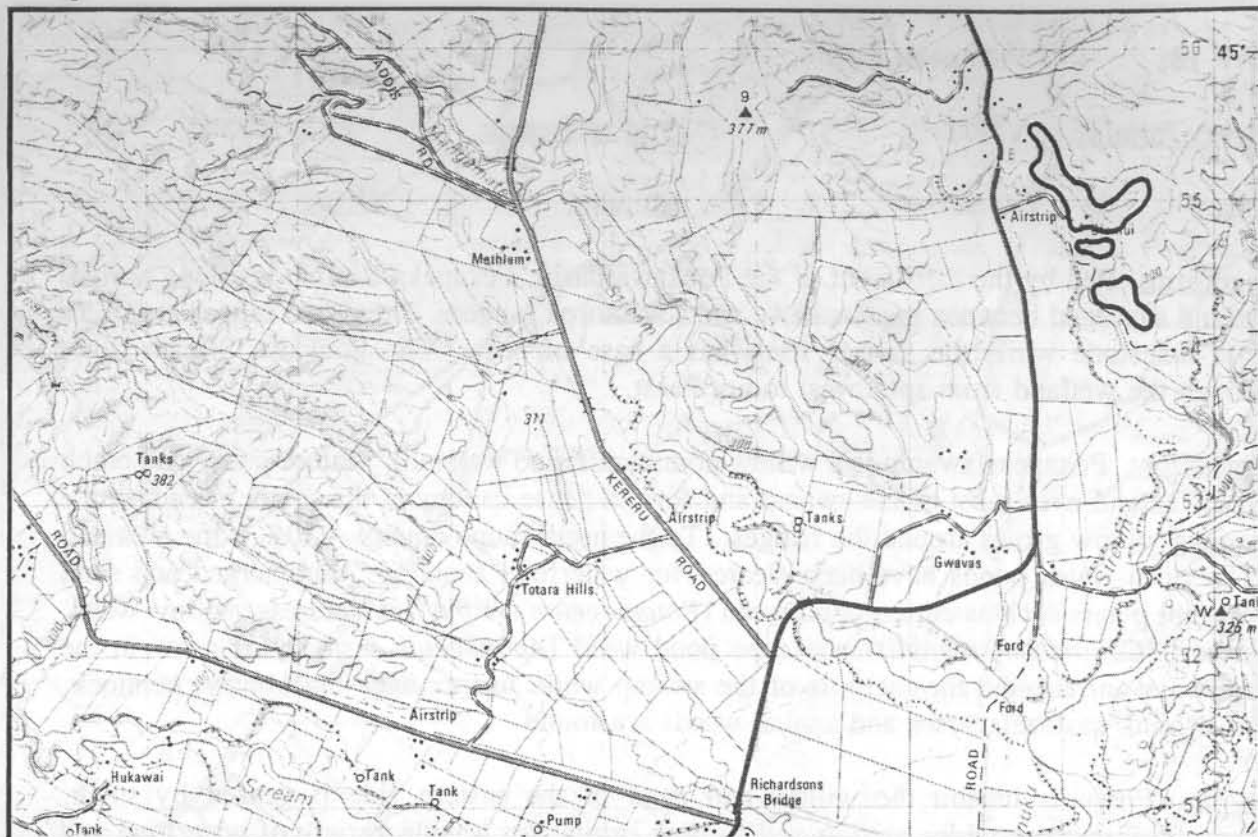
- Maintenance of stable water levels is of greatest concern. This is affected by water abstraction from the Poukawa Stream, mainly for irrigation.
- Pussy and crack willow are spreading.
- Upstream land use may affect future water quality.
- Some dumping of building rubble has occurred, affecting ~100m of the margins.

Selection criteria:

Representativeness	M-H	Viability	H
Diversity	M	Size and shape	H
Special features	H	Buffering	M
Naturalness	M	Fragility and Threat	M

Significance: H

Large wetlands of this quality are rare in the Heretaunga ecological district. With maintenance of stable water levels and control of willows this swamp could be reinstated to its former glory.



RAP 19: Glentui

Survey form(s): U22/1

Grid reference: U22, 091550

Area: 19 ha

Altitude: 240-300m

Landform: This RAP is located partly on swampy stream terraces of the Mangaonuku Stream and partly on moderate to steep hill slopes backing onto these terraces. A low sandstone bluff contours part of Area A.

Vegetation:

Area A - Kahikatea-dominated podocarp forest with about 30% of the area being open swampy clearings of *Carex spp* and pasture grasses. The canopy height ranges between 10 and 25 metres and a partial subcanopy of kohuhu, *Coprosma spp* and rohutu (*Lophomyrtus obcordata*) is present. Totara is more common on the drier slopes and the understory throughout is sparse and consists mostly of regenerating totara, kahikatea and a few ferns.

Area B - This part of the RAP has a cover of mixed podocarp-broadleaved forest and has a more unbroken canopy than that of Area A. Totara is the dominant tree of the hill slopes with kahikatea, matai, kowhai, marbleleaf and mahoe all being common. A stand of pole kahikatea of ~20-30cm DBH is located on the alluvial terrace at the foot of the hill slope. Where stock have access to the understory it is very sparse and consists of mainly a few low ferns, but on the low bluffs a diverse and dense cover which includes hangehange, rangiora, *Coprosma spp*, pate, climbing rata and ferns grows. A 10-20m wide band of gorse grows around the upper edge of this area.

Fauna: Possums are present in moderate numbers and domestic stock have access to most of the area, the exception being the steep bluff. Common pasture and bush birds are present, probably nothing unusual or rare. Trout and eels inhabit the stream, torrentfish, dwarf galaxias and Cran's, redfinned, bluegilled and common bullies are possibly present (known from Waipawa River sites).

Cultural: Terraces are located close to this area, other sites may be present. Not fully surveyed.

Modifiers/Threats:

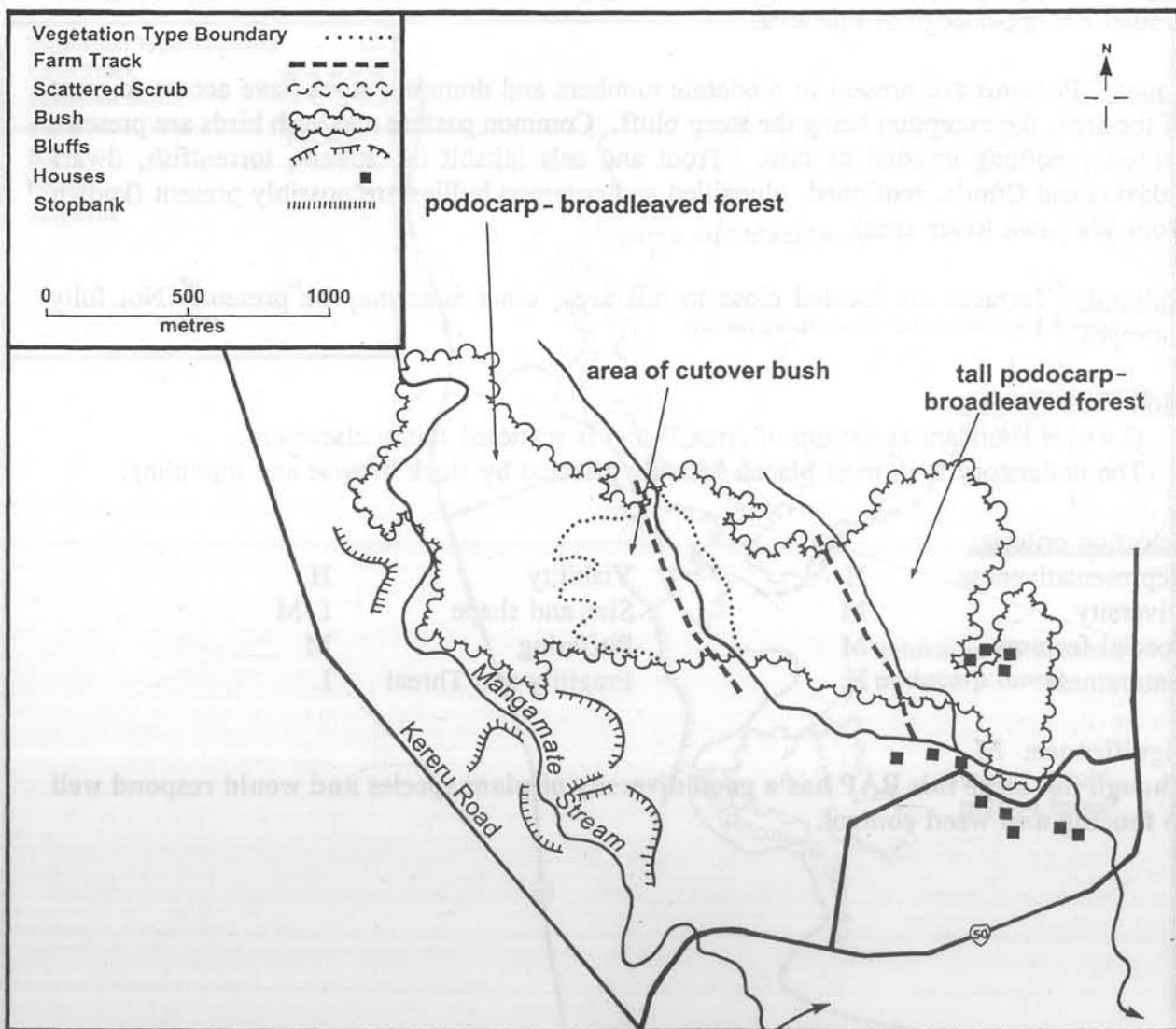
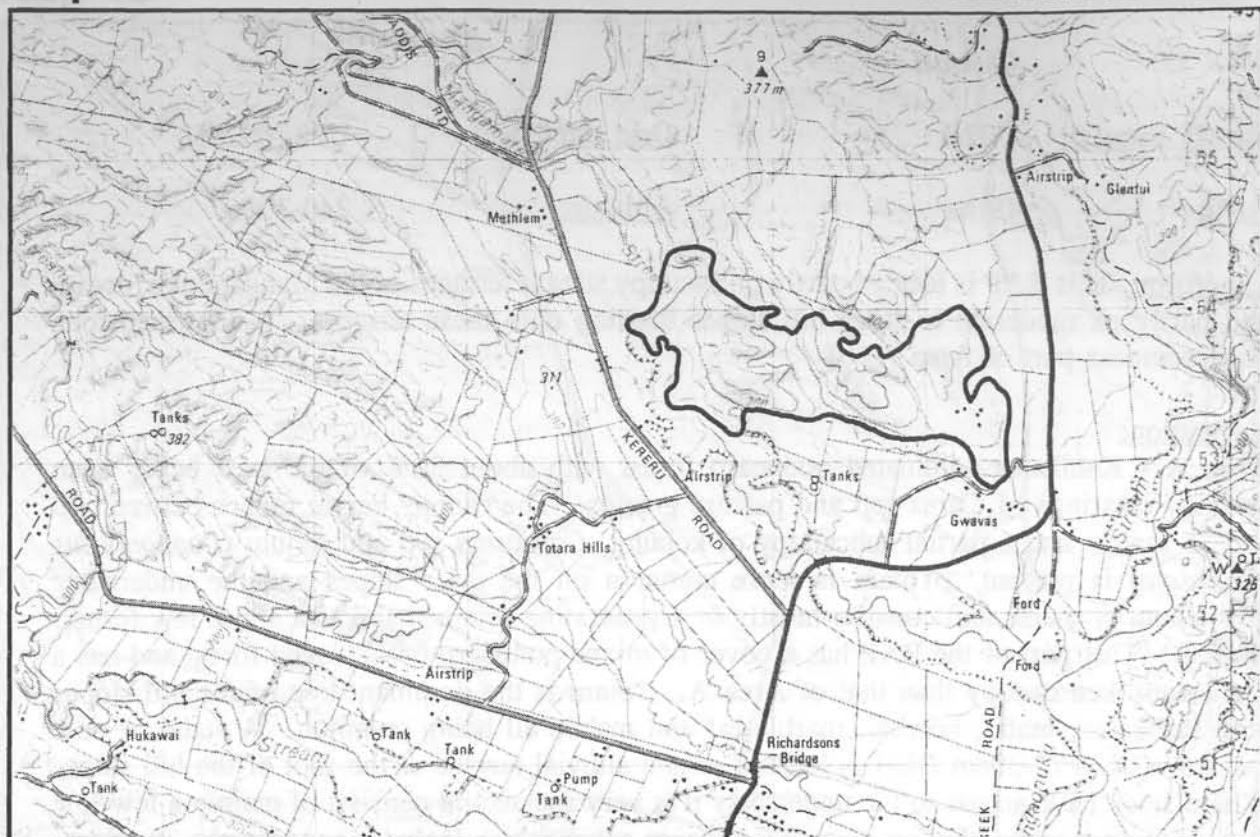
- Gorse is abundant at the top of Area B and is scattered thinly elsewhere.
- The understory is in most places severely affected by stock browse and trampling.

Selection criteria:

Representativeness	H	Viability	H
Diversity	M	Size and shape	L-M
Special features	M	Buffering	M
Naturalness	H	Fragility and Threat	L

Significance: M

Though not large this RAP has a good diversity of plant species and would respond well to fencing and weed control.



RAP 20: Puahanui Bush

Survey form(s): U22/36 Grid reference: U22, 075535

Area: 160 ha Altitude: 260-340m

Landform: Rolling hill country and easy stream gullies underlain by deep gravels comprise this RAP. The Mangamate Stream flows past the western side of the RAP and 3 other small, meandering streams flow through the central part of the bush area to eventually join the Mangaonuku.

Vegetation: Tall podocarp-broadleaved forest. This block of podocarp-broadleaved forest is outstanding in the Heretaunga ecological district and is notable for the numbers of large trees, the density of the canopy and the large species diversity (a plant list of 146 species has been compiled for this RAP: Druce 1974). The most common podocarps are totara and kahikatea, with lesser numbers of matai and only very few rimu. Titoki is the dominant broadleaved tree, but rewarewa, pigeonwood, mahoe and black maire are also common. The canopy height is variable with many emergent kahikatea, totara and matai. A healthy subcanopy merges with a moderate to dense understory which includes kawakawa, small-leaved *Coprosma spp*, mapou, hangehange and ferns. There is a good ground cover of seedling trees, hook-grass, climbing rata and leaf litter.

Fauna: Possums and occasional deer are present but stock have not been deliberately grazed in this block since 1945. Many common bush birds are found in this RAP and a number of uncommon or threatened species have also been recorded. Kaka and pied tit are rare visitors while kiwi and weka have been introduced, though their current status is not known.

A population of long-tailed bats has been recorded, again their present status is uncertain. Peripatus is recorded in the SSWI inventory.

Cultural: No archaeological sites are recorded.

Modifiers/Threats:

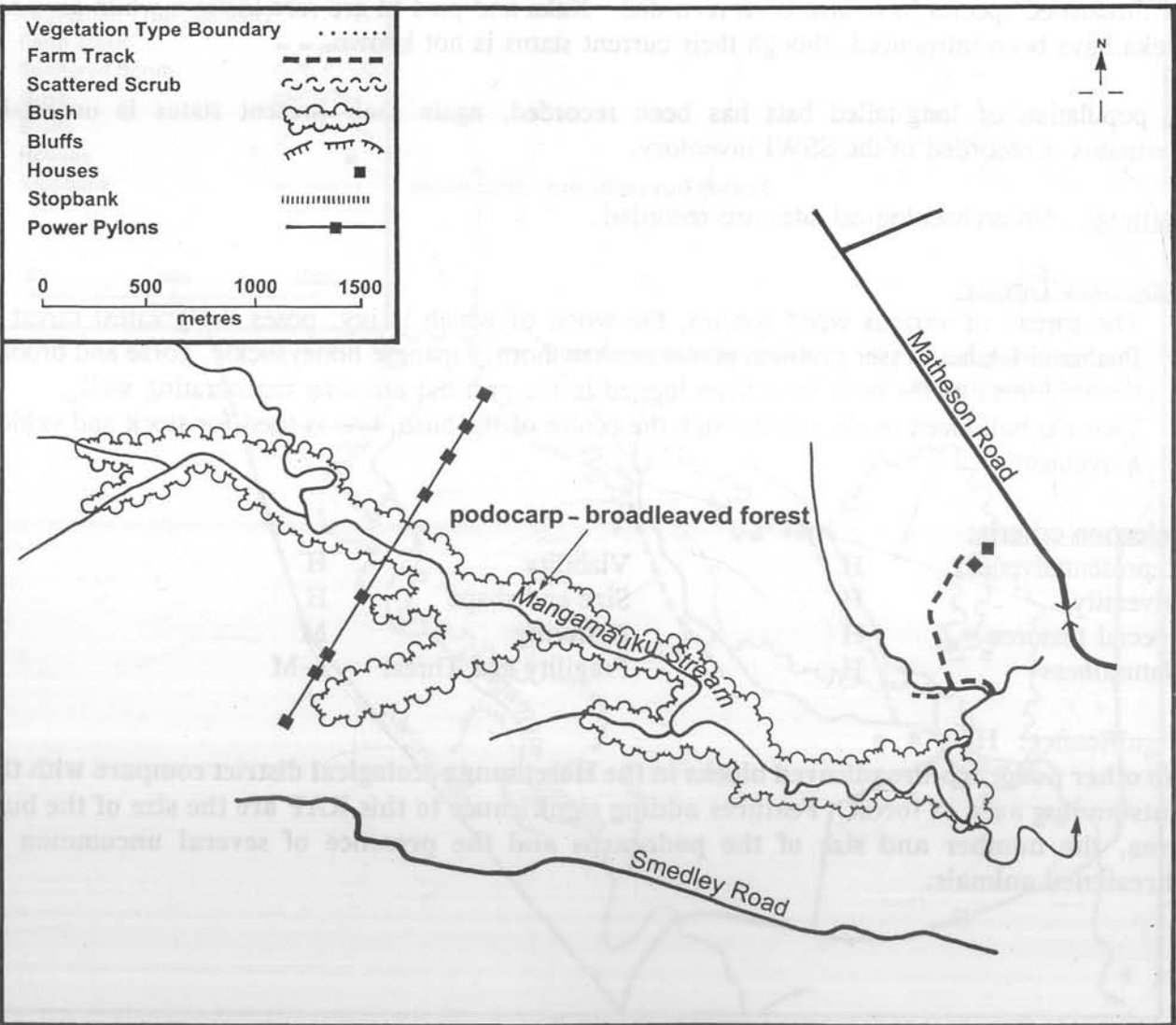
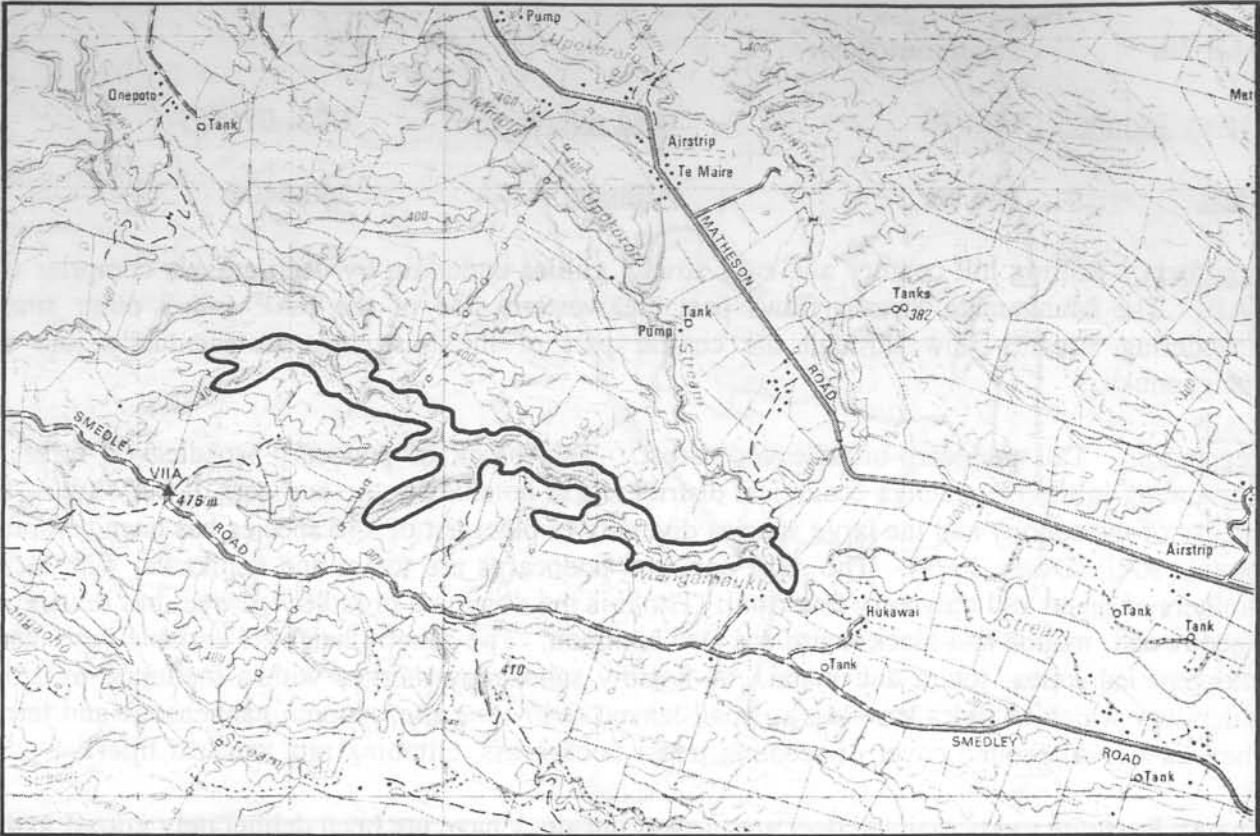
- The spread of various weed species, the worst of which is ivy, poses the greatest threat to Puahanui Bush. Lesser problem plants are hawthorn, Japanese honeysuckle, gorse and broom.
- Central areas of the bush have been logged in the past but are now regenerating well.
- Two old bulldozed tracks run through the centre of the bush, one is used for stock and vehicle movement.

Selection criteria:

Representativeness	H	Viability	H
Diversity	H	Size and shape	H
Special features	H	Buffering	M
Naturalness	H	Fragility and Threat	L-M

Significance: H

No other podocarp-broadleaved blocks in the Heretaunga ecological district compare with this outstanding area of forest. Features adding significance to this RAP are the size of the bush area, the number and size of the podocarps and the presence of several uncommon or threatened animals.



RAP 21: Mangamauku Stream

Survey form(s): U22/3 Grid reference: U22, 000523
Area: 115 ha Altitude: 260-400m

Landform: The riparian vegetation on both sides of a steep sided stream gorge makes up this RAP. There are a few small stream terraces in the gorge and a few steep bluffs dropping into the stream.

Vegetation: Both mature and regenerating podocarp-broadleaved forest covers ~ 70% of this area. This forest has a variable canopy 10-20m tall and includes totara, kahikatea, matai, mahoe, lacebark, marbleleaf, black maire, kohuhu and lacebark. A few large kahikatea, matai and rimu emerge through the canopy and on wetter sites and a few terraces are dense stands of regenerating kahikatea. Black beech forest is prominent on drier faces and spurs and covers ~20% of the total area. Some small stands of 4-6m tall manuka grow on the south side of the stream (<5% of the area). A healthy understory of *Coprosma spp*, mingimingi, *Helichrysum lanceolatum*, mapou and ferns is present throughout most of the area and ranges from moderate to dense. A ground cover of hook-grass, low ferns, seedlings, herbs and leaf litter covers the forest floor.

Fauna: Feral deer are present in low numbers and a few goats have been shot in the past few years. Possums are present in moderate numbers. Common bush and pasture birds are present - pied tit, rifleman and fernbird are recorded in the SSWI inventory, which gives this area a moderate rating. Trout were seen in the stream. Eels were also seen and other native fish may be present.

Cultural: No cultural sites are recorded.

Modifiers/Threats:

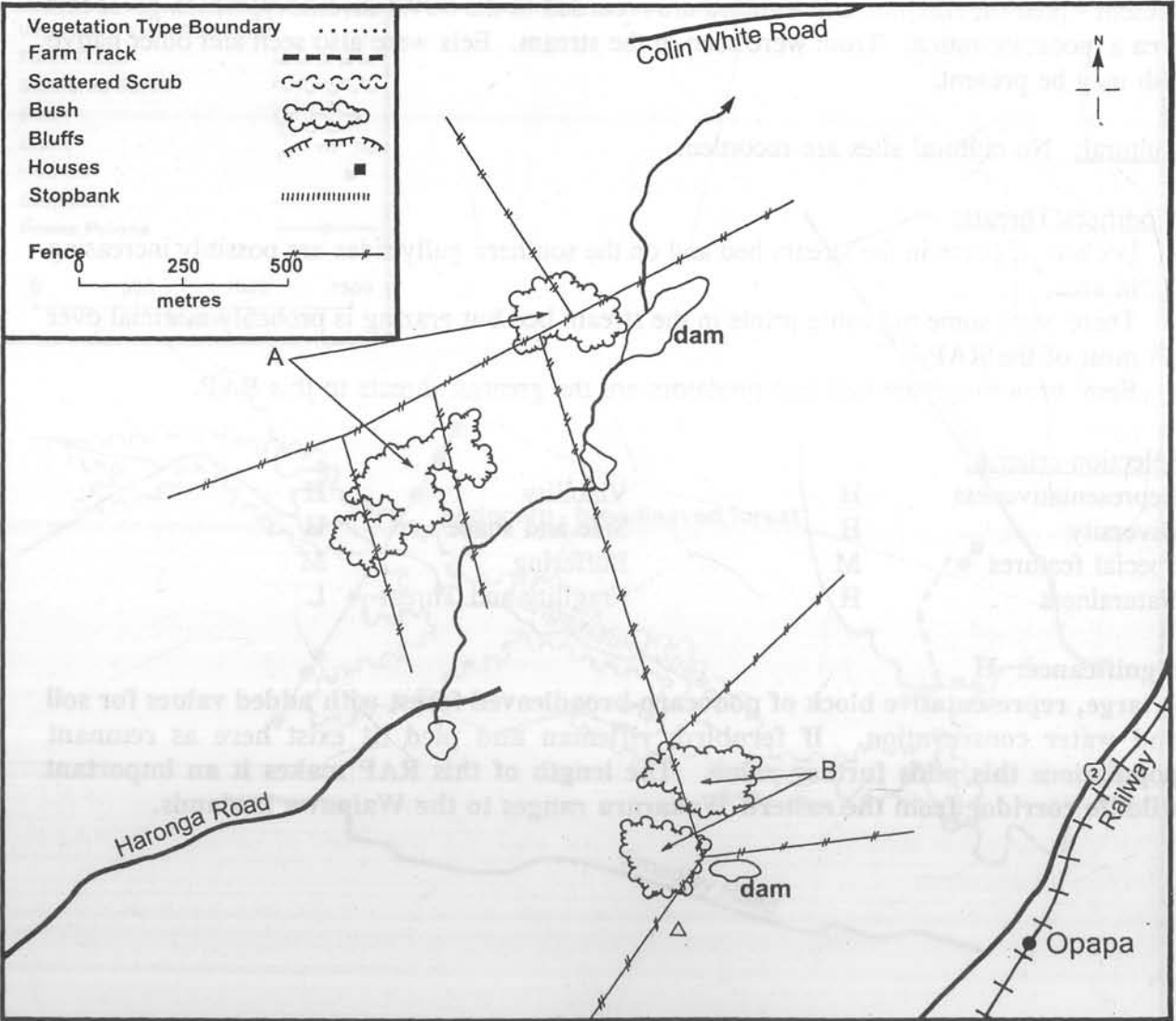
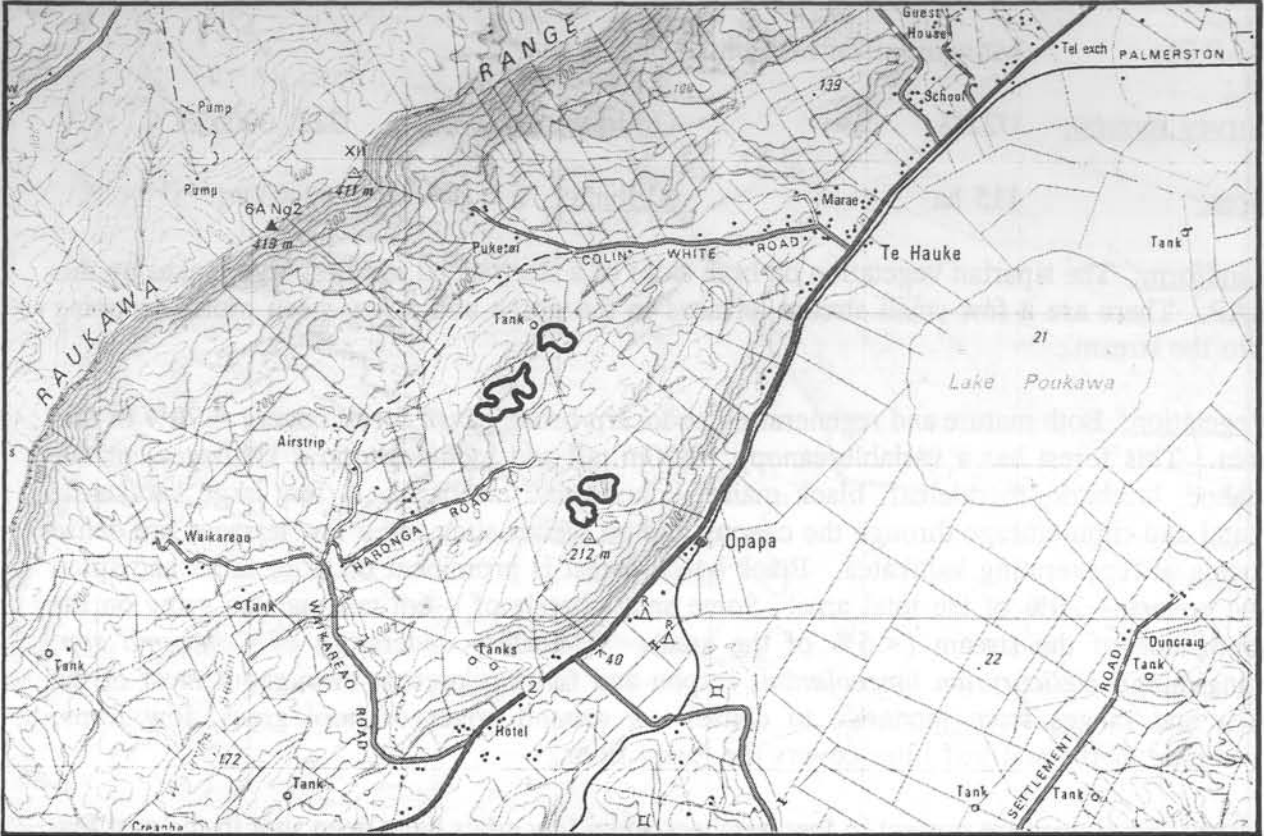
- Pockets of gorse in the stream bed and on the southern gully sides are possibly increasing in area.
- There were some old cattle prints in the stream bed but grazing is probably minimal over most of the RAP.
- Feral browsing mammals and predators are the greatest threats to this RAP.

Selection criteria:

Representativeness	H	Viability	H
Diversity	H	Size and shape	H
Special features	M	Buffering	M
Naturalness	H	Fragility and Threat	L

Significance: H

A large, representative block of podocarp-broadleaved forest with added values for soil and water conservation. If fernbird, rifleman and pied tit exist here as remnant populations this adds further value. The length of this RAP makes it an important wildlife corridor from the eastern Wakarara ranges to the Waipawa lowlands.



RAP 22: Haronga Road

Survey form(s): V22/3 Grid reference: V22, 236514
Area: 11.5 ha Altitude: 120-200m

Landform: Two areas separated by ~1km from this RAP. Mid valley slopes of easy hill country in the foothills of the Raukawa Range constitute Area A, and Area B is on a hilltop further east overlooking the Poukawa basin. Waitotaran limestone is the underlying rock type of the Raukawa Range and foothills.

Vegetation:

Area A: Treeland composed predominantly of titoki (80%) but with totara, karaka, pigeonwood, kaikomako, tawa, ngaio, raukawa, turepo and rewarewa scattered evenly throughout.

Area B: Pure titoki-karaka treeland, no other tree species were seen.

Both of these areas have a broken canopy and the bush edges are not well defined. Most trees are the same age and the treeland appears to be in decline - several dead trees were observed.

As a result of intensive grazing over many years domestic stock, including goats, have completely destroyed the understory. All that now remains are a few chewed tree nettle bushes and pasture grass in Area A and nothing except pasture in Area B. Apart from tree species, climbing rata and pohuehue were the only other native plants seen.

Fauna: Possums are probably present in low-moderate numbers. Both areas are intensively grazed by stock. Common pasture birds are present but no bush birds were noted.

Cultural: Many Maori pa were located on hills surrounding the Poukawa basin and forest areas of the Raukawa range were used extensively for bird hunting and the gathering of food. People value these treelands highly in their landscapes, and recognise individual trees as landmarks.

Modifiers/Threats:

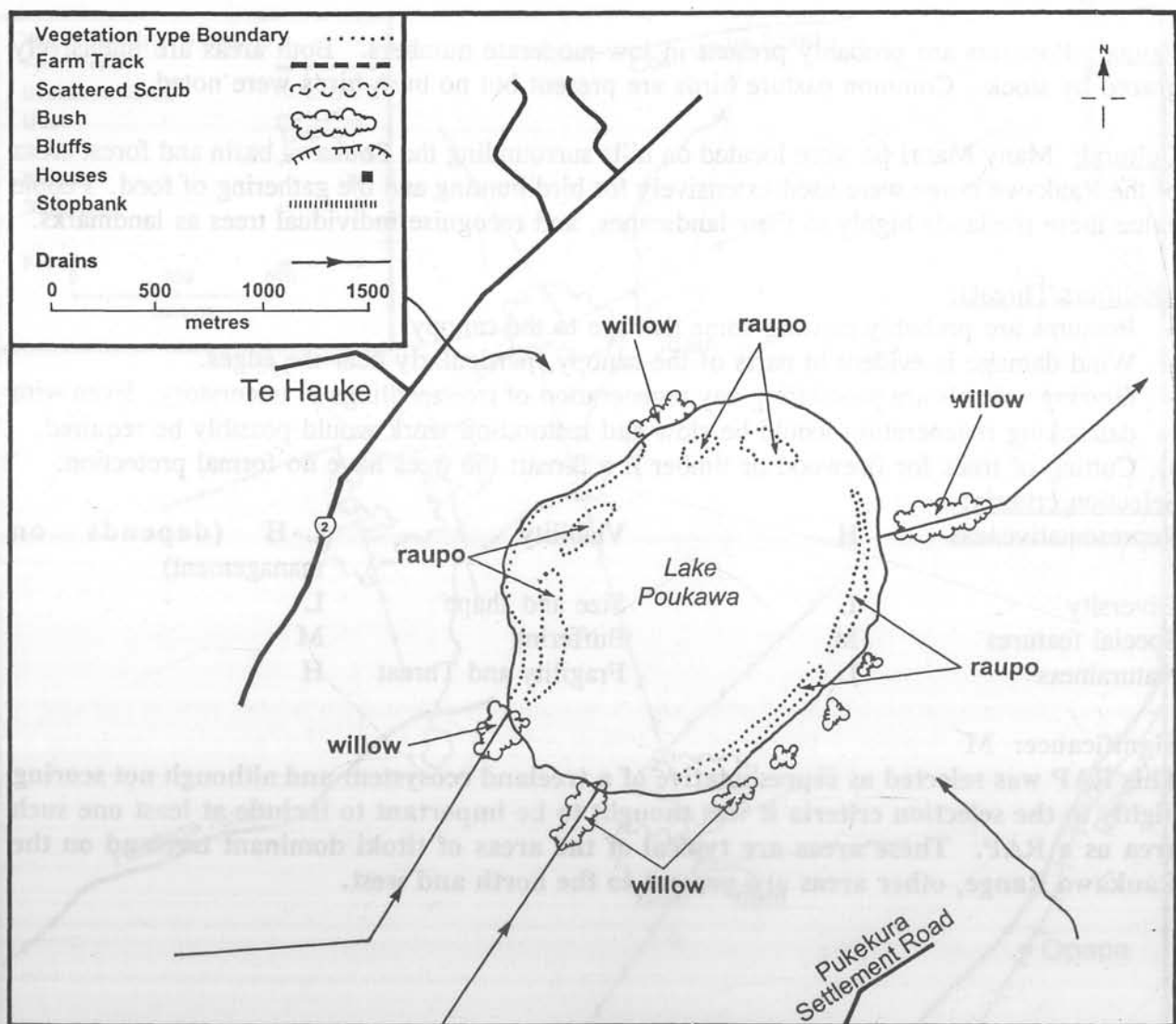
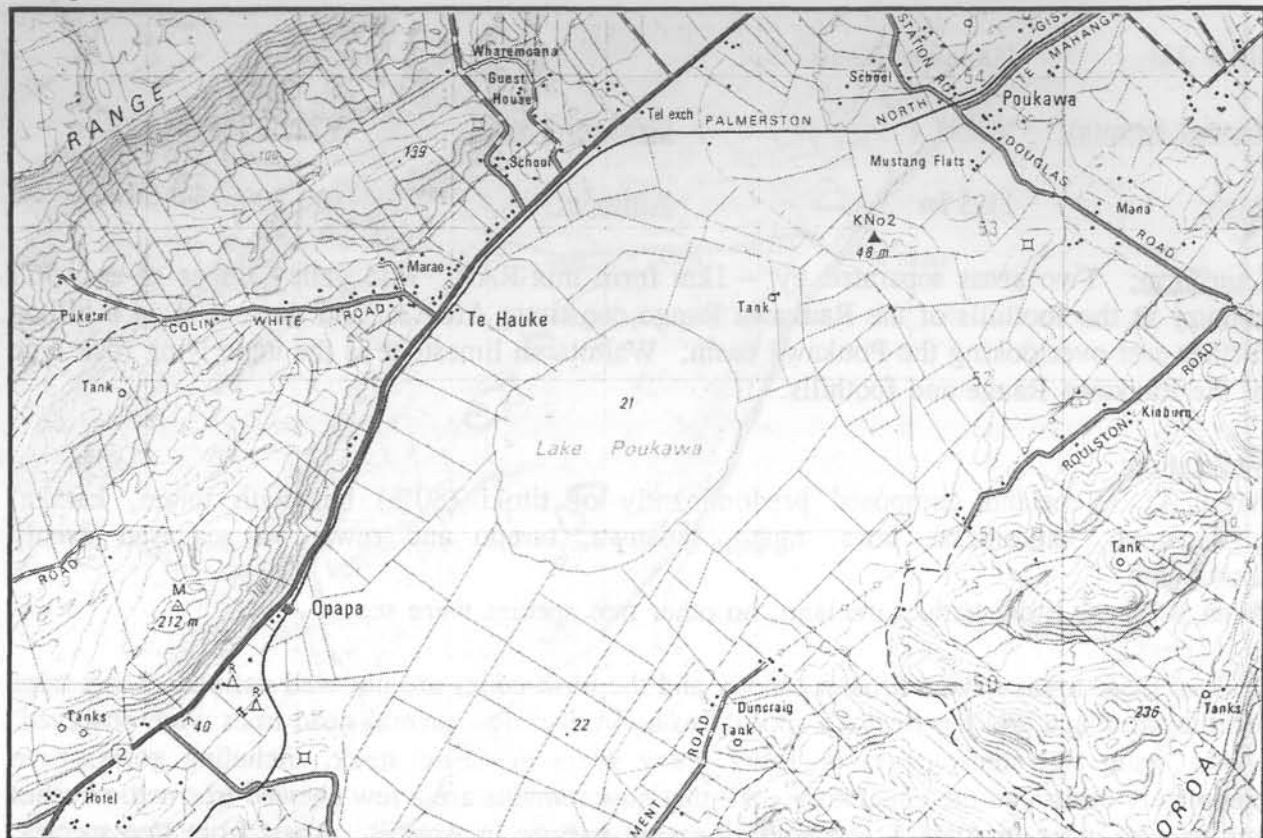
- Possums are probably causing some damage to the canopy.
- Wind damage is evident in parts of the canopy, particularly near the edges.
- Grazing animals are prohibiting any regeneration of tree seedlings or understory. Even with destocking regeneration would be slow and restoration work would possibly be required.
- Cutting of trees for firewood or timber is a threat: the trees have no formal protection.

Selection criteria:

Representativeness	H	Viability	L-H (depends on management)
Diversity	L	Size and shape	L
Special features	M	Buffering	M
Naturalness	L	Fragility and Threat	H

Significance: M

This RAP was selected as representative of a treeland ecosystem and although not scoring highly in the selection criteria it was thought to be important to include at least one such area as a RAP. These areas are typical of the areas of titoki dominant treeland on the Raukawa Range, other areas are present to the north and west.



RAP 23: Lake Poukawa

Survey form(s): V22/11 Grid reference: V22, 270515

Area: 195 ha Altitude: 30m

Landform: Located in the centre of a large basin, this shallow lake is approximately 1.5km in diameter, varying greatly depending on rainfall. Underlying the lake and extending to the base of surrounding limestone hills is a layer of peat up to ~10m deep. Several small streams enter the lake and drainage is via the Poukawa Stream which flows northeast into the Pekapeka Swamp.

Vegetation: Agricultural development has much modified the native vegetation of Lake Poukawa. Marginal vegetation consists of scattered pockets of crack and pussy willow and low growing rushes and weeds, while extensive beds of tall raupo grow further back into the lake out of reach of grazing stock. Submerged aquatic vegetation consists almost entirely of thick beds of the native alga *Chara corallina*. Streams and drains entering the lake, and the outlet channel, contain dense areas of curled pond weed (*Potamogeton crispus*), watercress, water milfoil (*Myriophyllum triphyllum*) and other common aquatic weeds.

Fauna: All of the lake edge is grazed by stock. The lake supports high numbers of both migratory and resident waterfowl and wading birds, and is used for feeding, nesting and moulting. Bittern, spotless crane and dabchick breed at the lake and black-fronted dotterel and mute swan are recorded.

Long and short finned eels are common, though numbers have declined through overfishing in recent years. Inanga are recorded from Poukawa Stream and common bullies and goldfish inhabit the lake. The SSWI ranking is high and the WERI ranking is national.

Cultural: Many pa were located on surrounding hills and great use was made of the lake and low lying swamps for the gathering of food including eels, kakahi (freshwater mussels), kokopu (*Galaxias sp*) and waterfowl.

Modifiers/Threats:

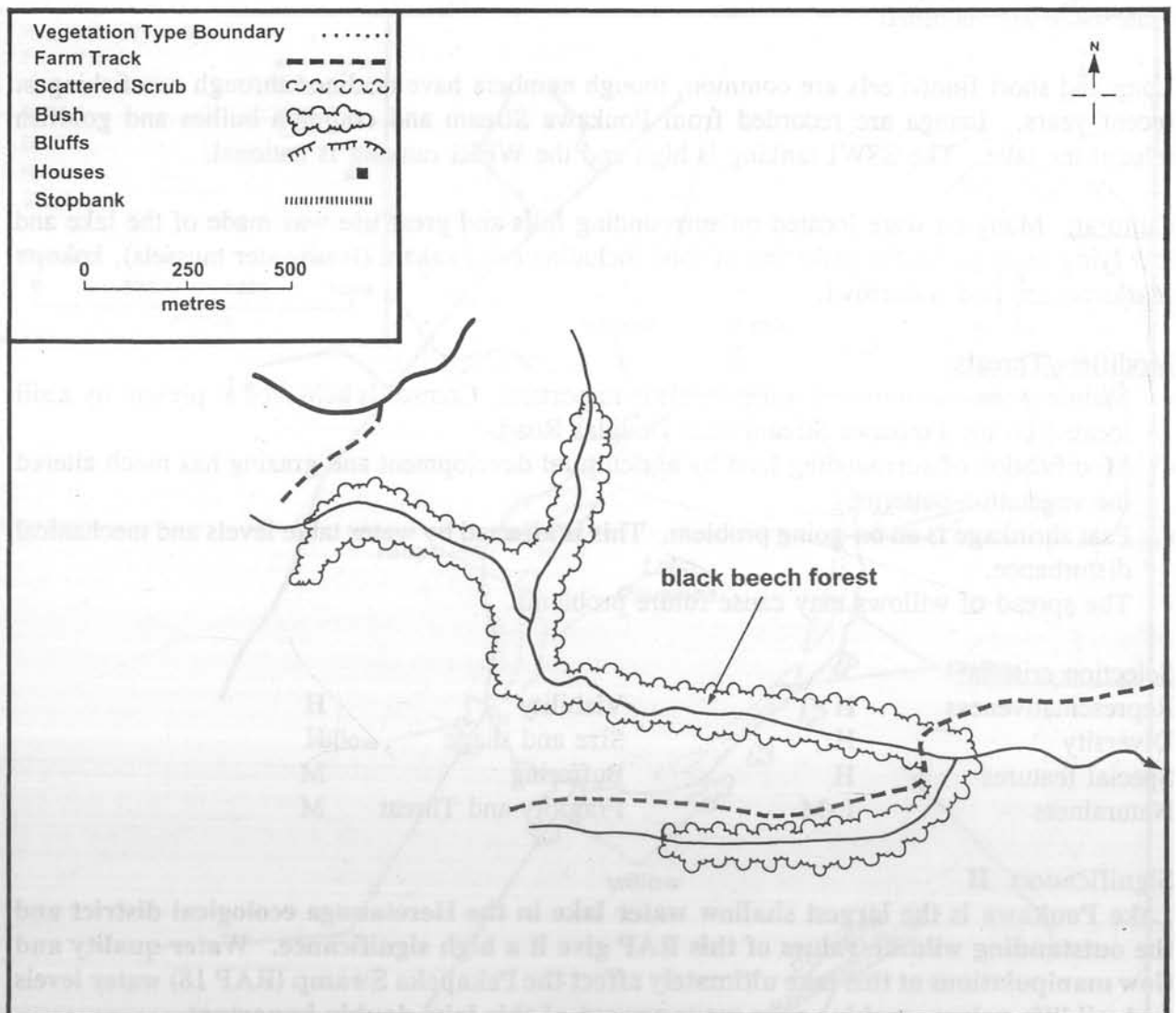
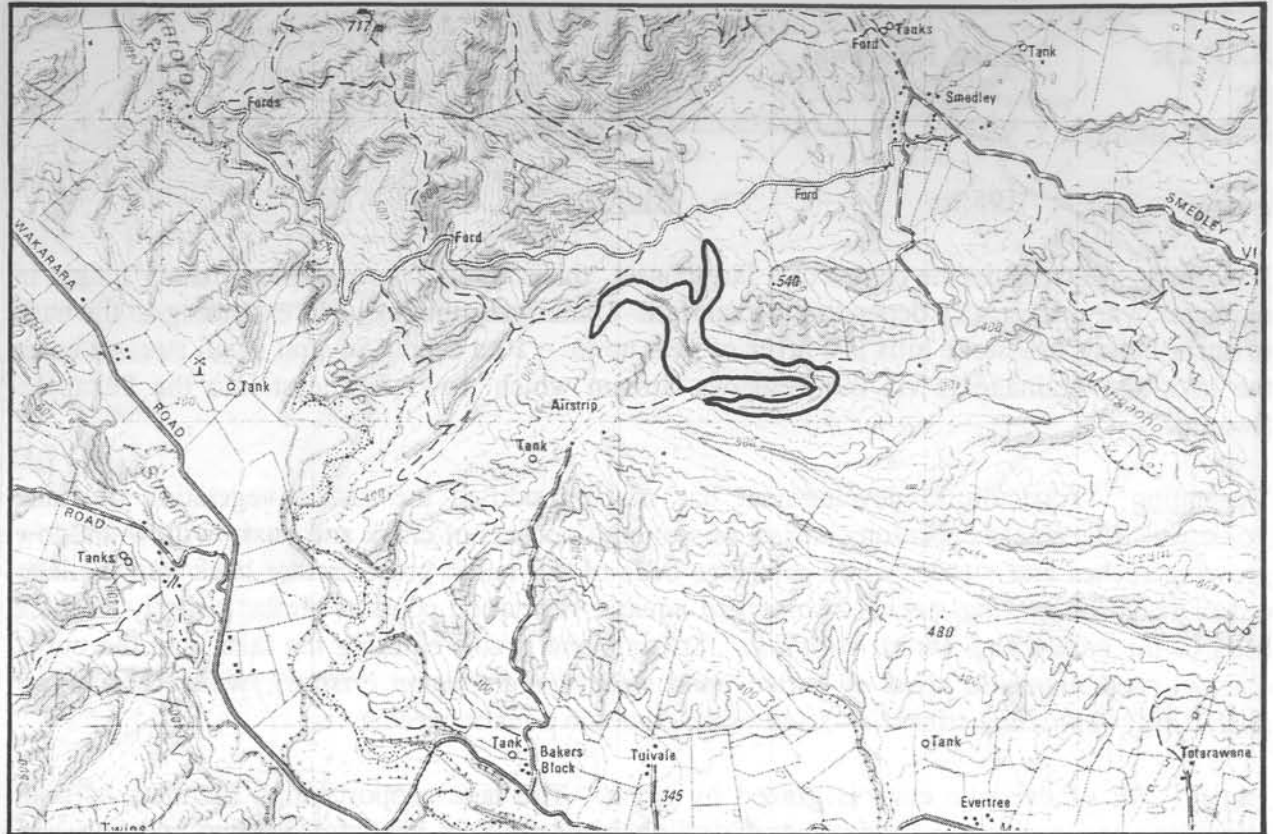
- Maintenance of controlled water levels is important. Control is achieved at present by a sill located on the Poukawa Stream near Douglas Road.
- Modification of surrounding land by agricultural development and grazing has much altered the vegetation patterns.
- Peat shrinkage is an on-going problem. This is affected by water table levels and mechanical disturbance.
- The spread of willows may cause future problems.

Selection criteria:

Representativeness	H	Viability	H
Diversity	H	Size and shape	H
Special features	H	Buffering	M
Naturalness	L-M	Fragility and Threat	M

Significance: H

Lake Poukawa is the largest shallow water lake in the Heretaunga ecological district and the outstanding wildlife values of this RAP give it a high significance. Water quality and flow manipulations at this lake ultimately affect the Pekapeka Swamp (RAP 18) water levels and wildlife values, making wise management of this lake doubly important.



RAP 24: Mangaoho No. 2

Survey form(s): U22/10

Grid reference:

U22 945515

Area: 28 ha

Altitude:

400-460m

Landform: This RAP is located in steep stream gullies surrounded by moderate to steep hill country at the base of the Wakarara Range.

Vegetation: Mature black beech forest covers the sides and base of this stream gully with rimu, kahikatea, matai and totara comprising <10% of the canopy. Mahoe, heketara, *Coprosma spp*, fuchsia, lemonwood and other broadleaved tree species form a healthy subcanopy layer in the gully bottom. Below this is a moderately dense understory of *Coprosma spp*, mingimingi, *Helichrysum lanceolatum*, and ferns. This vegetation is similar to other beech gullies on Smedley Station but due to limited stock usage probably has the most diverse list of plant species (45 recorded on the field survey).

Fauna: Possums are present in moderate numbers and stock have access to the gully but do not seem to have had a large impact. Most of the more common bush birds are present but probably nothing unusual or rare is found here.

Cultural: No archaeological sites are recorded.

Modifiers/Threats:

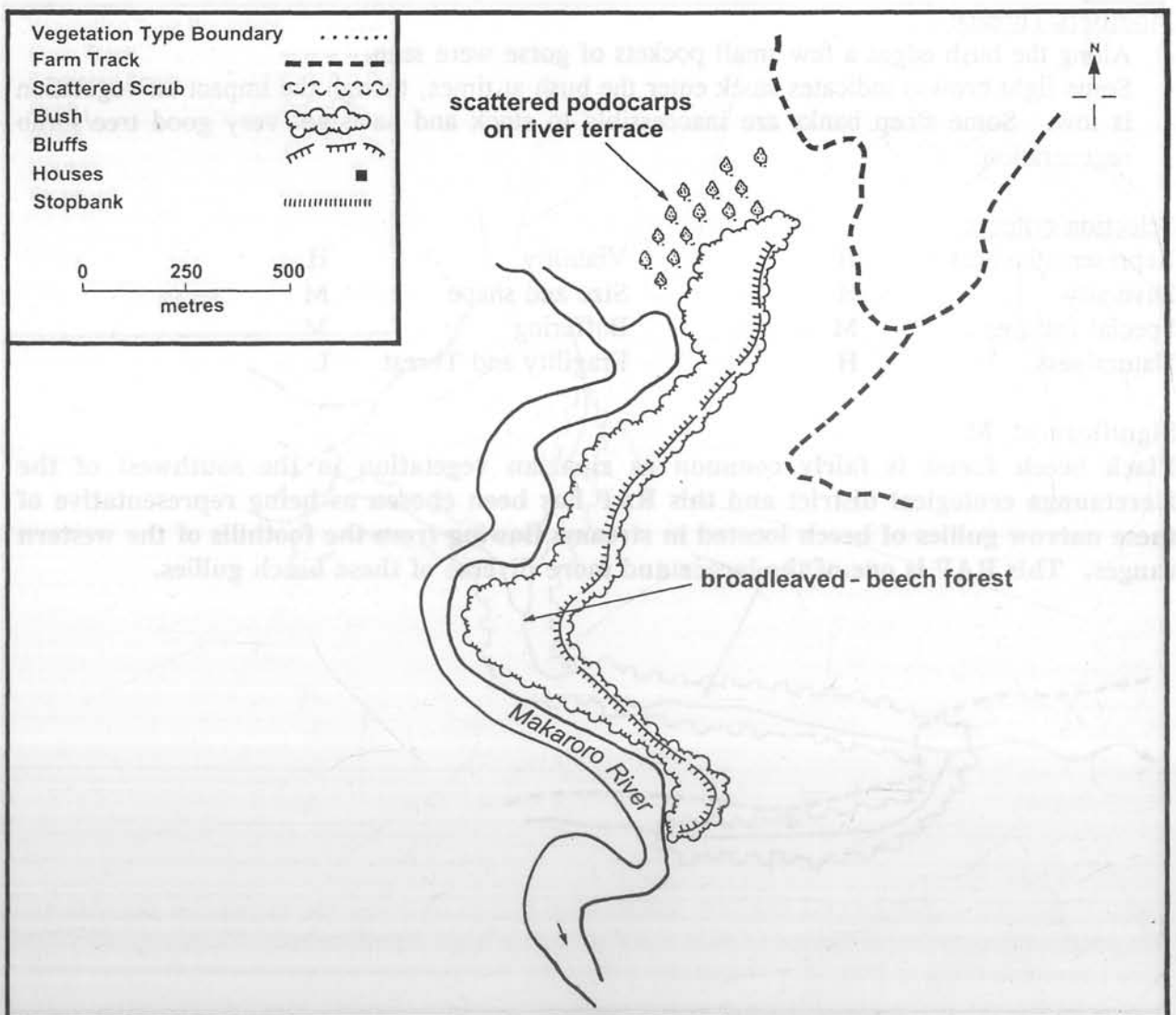
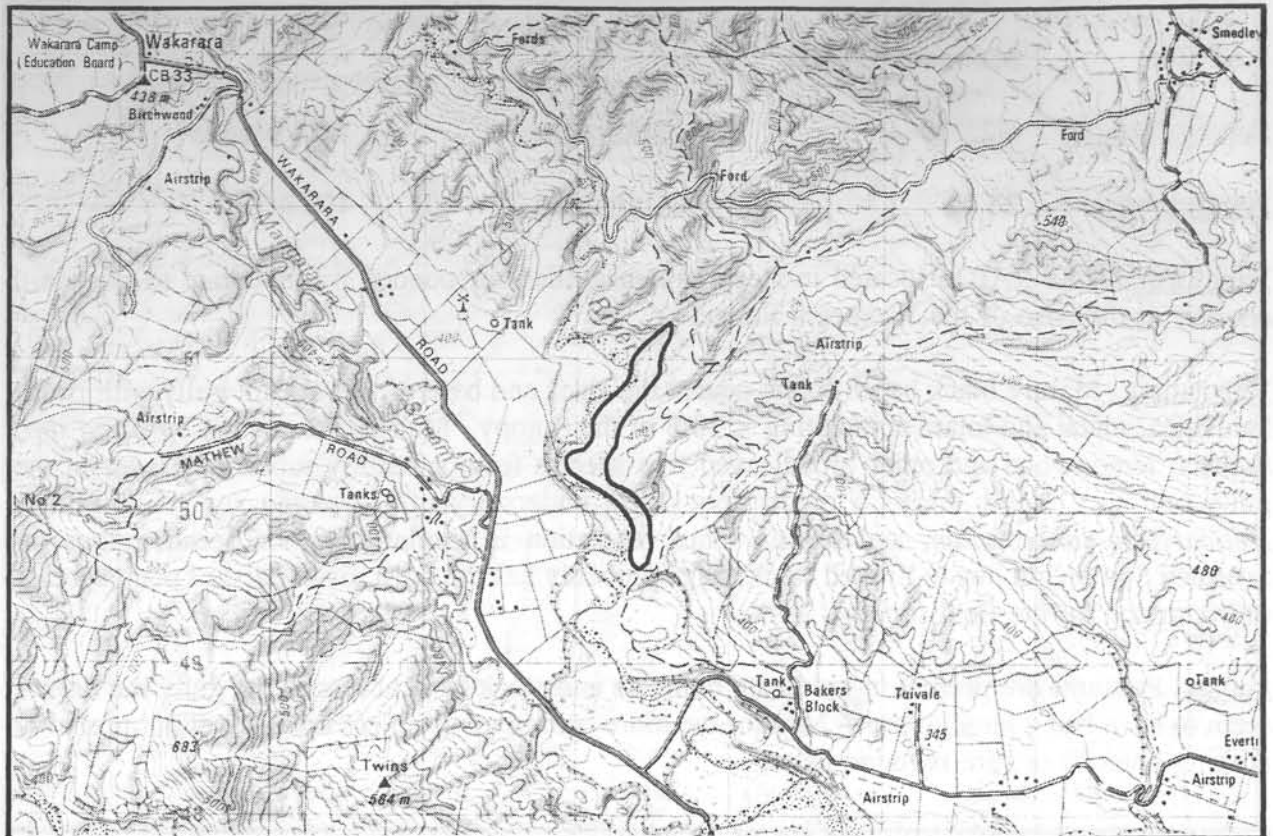
- Along the bush edges a few small pockets of gorse were seen.
- Some light browse indicates stock enter the bush at times, though the impact on vegetation is low. Some steep banks are inaccessible to stock and have got very good tree/shrub regeneration.

Selection criteria:

Representativeness	H	Viability	H
Diversity	H	Size and shape	M
Special features	M	Buffering	M
Naturalness	H	Fragility and Threat	L

Significance: M

Black beech forest is fairly common as riparian vegetation in the southwest of the Heretaunga ecological district and this RAP has been chosen as being representative of these narrow gullies of beech located in streams flowing from the foothills of the western ranges. This RAP is one of the larger and more diverse of these beech gullies.



RAP 25: Smedley Bluffs

Survey form(s): U22/12

Grid reference: U22, 925509

Area: 21 ha

Altitude: 350-400m

Landform: Bluffs and faces dropping steeply into the bed of the Makaroro River. At the top of the faces the slopes are almost vertical, becoming less steep nearer the river.

Vegetation: On the higher dry sites black beech is the dominant tree, covering ~20% of the total area, while a mix of broadleaved trees such as mahoe, pigeonwood, mapou, kohuhu, karamu, hangehange, lancewood and kowhai cover much of the remaining area. Good numbers of totara, kahikatea, matai and rimu are scattered through the northern half of the RAP and a few small pockets of manuka are present. On the steeper slopes of broadleaved forest the understory is very dense and includes mingimingi, *Helichrysum lanceolatum*, kohuhu, flax, bracken, small *Coprosma spp* and koromiko. There are a few grassy faces which appear to make up about 10-15% of the total area and these are regenerating slowly in manuka.

Fauna: There is sign of large animals around the top of the bluffs, possibly goats, and also a lot of possum sign high up.

Common bush birds are present but nothing unusual or rare is reported.

Cultural: No archaeological sites are recorded.

Modifiers/Threats:

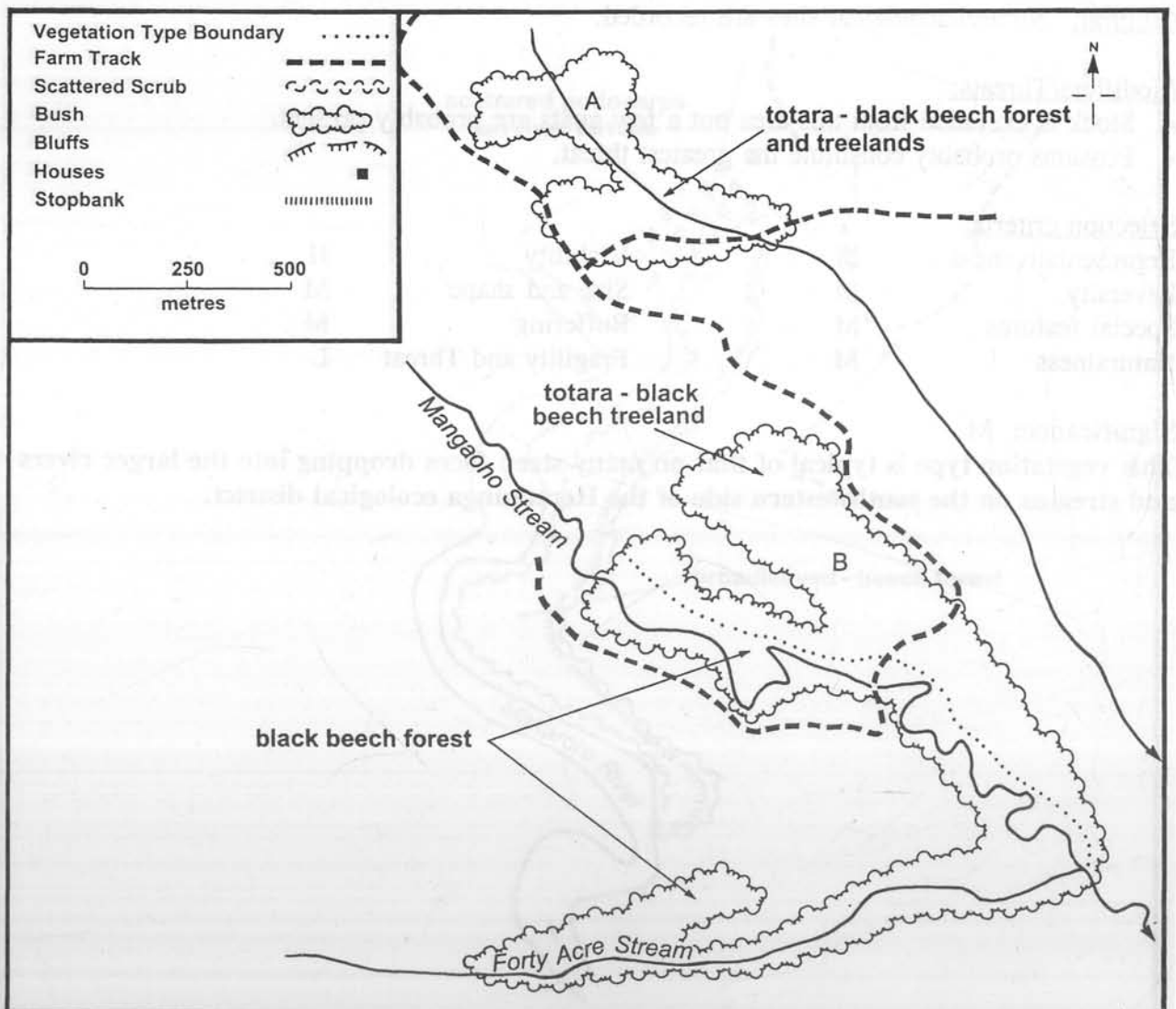
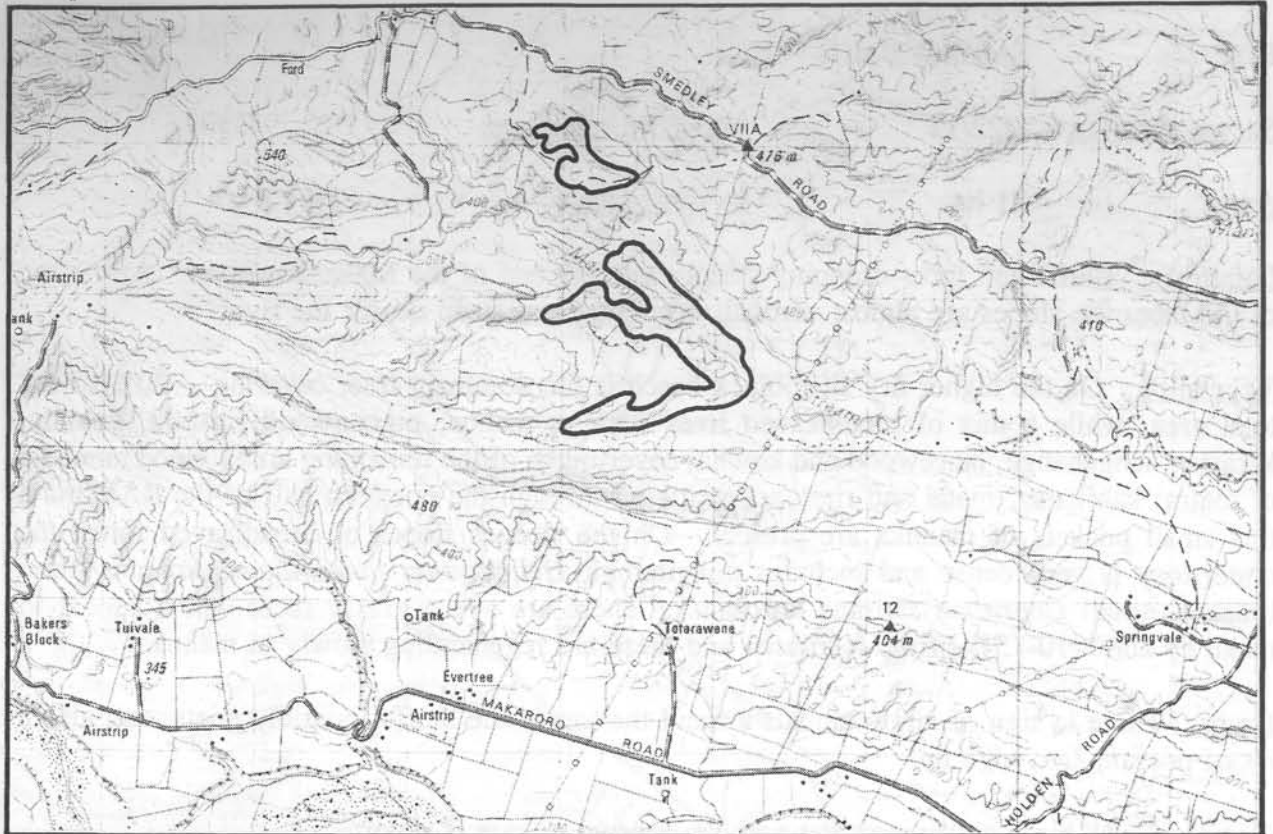
- Stock is excluded from this area but a few goats are probably present.
- Possums probably constitute the greatest threat.

Selection criteria:

Representativeness	M	Viability	H
Diversity	M	Size and shape	M
Special features	M	Buffering	M
Naturalness	M	Fragility and Threat	L

Significance: M

This vegetation type is typical of that on many steep faces dropping into the larger rivers and streams on the southwestern side of the Heretaunga ecological district.



RAP 26: Mangaoho No. 1

Survey form(s): U22/9

Grid reference:

U22, 971519

Area:

73 ha

Altitude:

420-480m

Landform: RAP 26 is in two blocks, both are rolling hill country spurs and gullies but the lower parts of Area B drop more abruptly into the Mangaoho Stream bed. The Mangaoho Stream has many low terraces and stream flats, and a shingle base.

Vegetation:

Area A: Totara-black beech forest and treelands with rewarewa, kahikatea and titoki scattered throughout (< 10%). Approximately 20% of this area is pasture grass and stock have reduced the understory to a few small totaras, browsed *Coprosma spp* and low ferns.

Area B: The upper slopes of this area have a similar vegetation type to Area A but with a less continuous canopy and a lesser black beech component. Probably ~50% of this area is in pasture and some trees have recently been felled and others limbed for firewood. The understory of this part of Area B is almost nil, only a few regenerating totara and small patches of low ferns. The lower and steeper slopes near the stream support mainly black beech with a moderately dense understory of mingimingi, *Coprosma spp* and gorse, particularly on the slopes out of reach of stock. Some small stands of kahikatea and matai are found on the lower stream terraces.

Fauna: All areas except a few steep slopes are grazed by stock. No unusual or rare birds are reported but most common bush and pasture birds are present.

Cultural: No archaeological sites are recorded.

Modifiers/Threats:

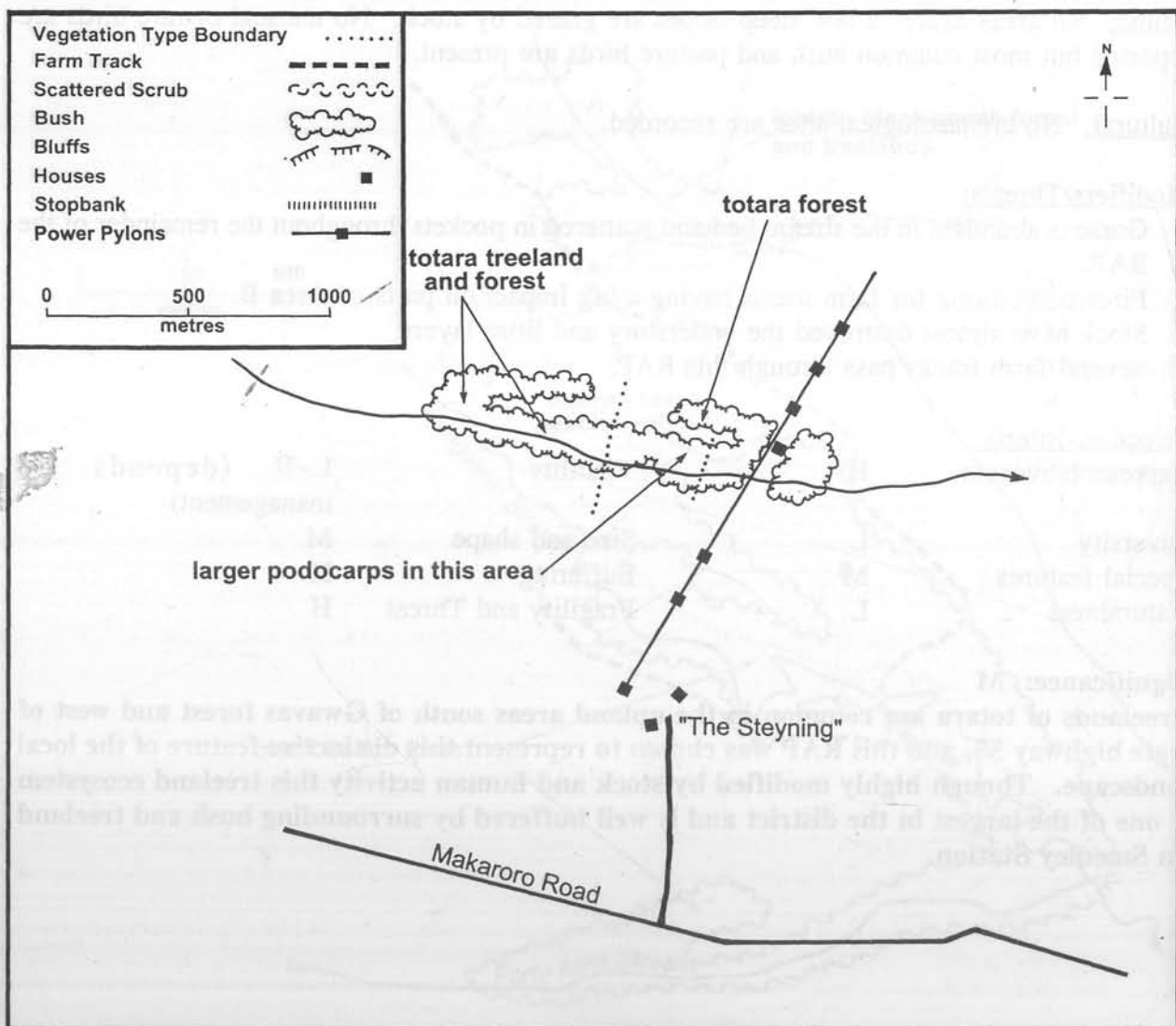
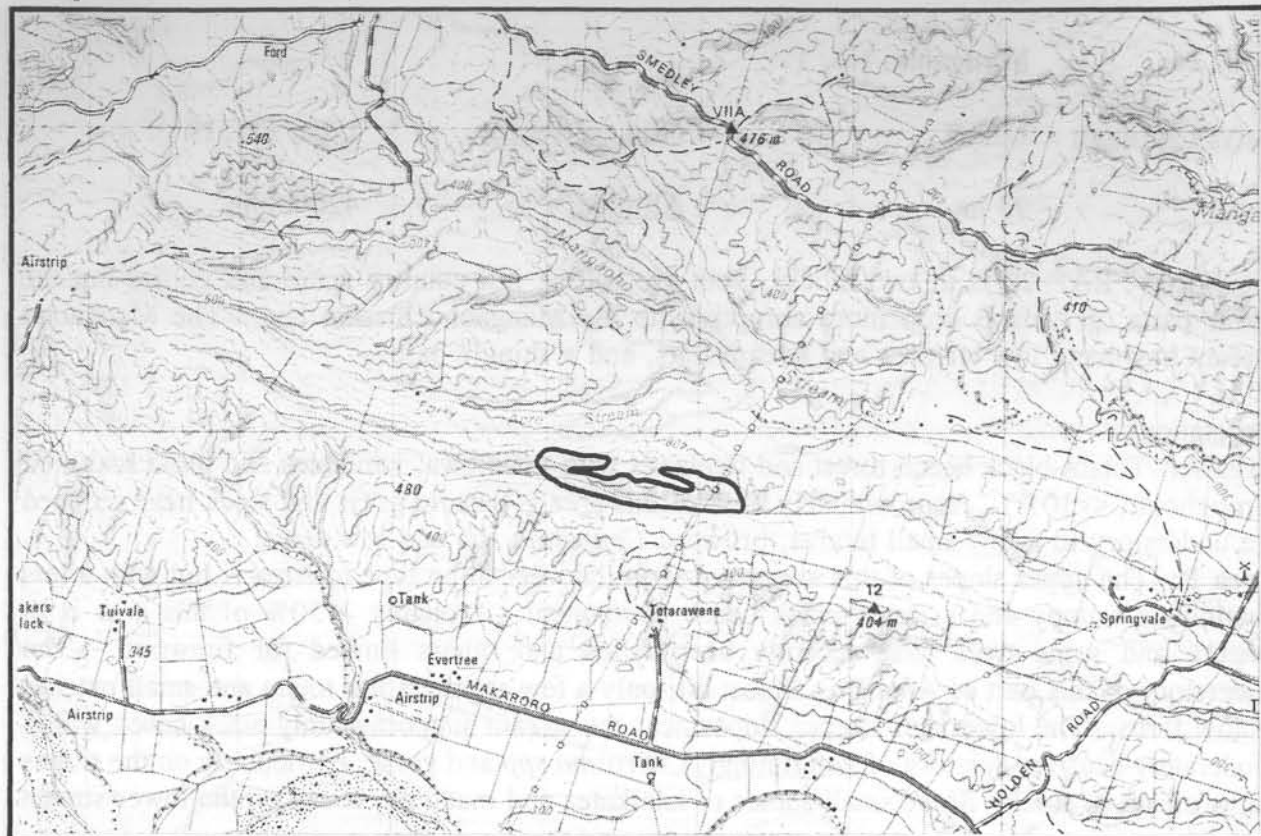
- Gorse is abundant in the stream bed and scattered in pockets throughout the remainder of the RAP.
- Firewood cutting for farm use is having a big impact on parts of Area B.
- Stock have almost destroyed the understory and litter layers.
- Several farm tracks pass through this RAP.

Selection criteria:

Representativeness	H	Viability	L-H (depends on management)
Diversity	L	Size and shape	M
Special features	M	Buffering	H
Naturalness	L	Fragility and Threat	H

Significance: M

Treelands of totara are common in the upland areas south of Gwavas forest and west of state highway 50, and this RAP was chosen to represent this distinctive feature of the local landscape. Though highly modified by stock and human activity this treeland ecosystem is one of the largest in the district and is well buffered by surrounding bush and treeland on Smedley Station.



RAP 27: **Holdens No. 2**

Survey form(s): U22/13

Grid reference:

U22, 975495

Area:

23 ha

Altitude:

380-420m

Landform: Rolling short gullies and ridges dropping into an easy stream gully. The small stream running through the RAP was almost dry at the time of survey.

Vegetation: At the western end of this forest block the canopy trees comprise almost pure totara with only a few kahikatea and cabbage trees. The canopy is broken to the west but increases in height and density toward the centre of the block. There are quite a number of small regenerating totara in places. The centre section of the RAP is tall mixed podocarp forest, predominantly large totara but with many kahikatea, rimu and matai. Many of these trees are up to ~1.5m DBH and 30-40m tall. Throughout this centre section is a sparse subcanopy of mahoe, pigeonwood, marbleleaf and rohutu, with a few areas of supplejack in the damper gullies, but there is almost no understory due to stock pressure. At the eastern end of the RAP are dense stands of totara with a few mahoe and cabbage trees in the canopy. Again, no understory is present.

Fauna: A moderate amount of possum sign was seen in the area and stock range throughout the block. Common bush birds are present.

Cultural: No archaeological sites are recorded.

Modifiers/Threats:

- Some large, old stumps are visible. Many accessible high yield timber trees remain and logging of these could be a future threat.
- Stock browsing has destroyed the understory, visibility is generally 50-100m through the bush. Possums also constitute a persistent threat.
- Power pylons pass through the eastern end of the RAP and a 40m wide corridor has been cut below them.

Selection criteria:

Representativeness	M-H
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Viability	M
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Diversity M

Size and shape	M
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Special features H

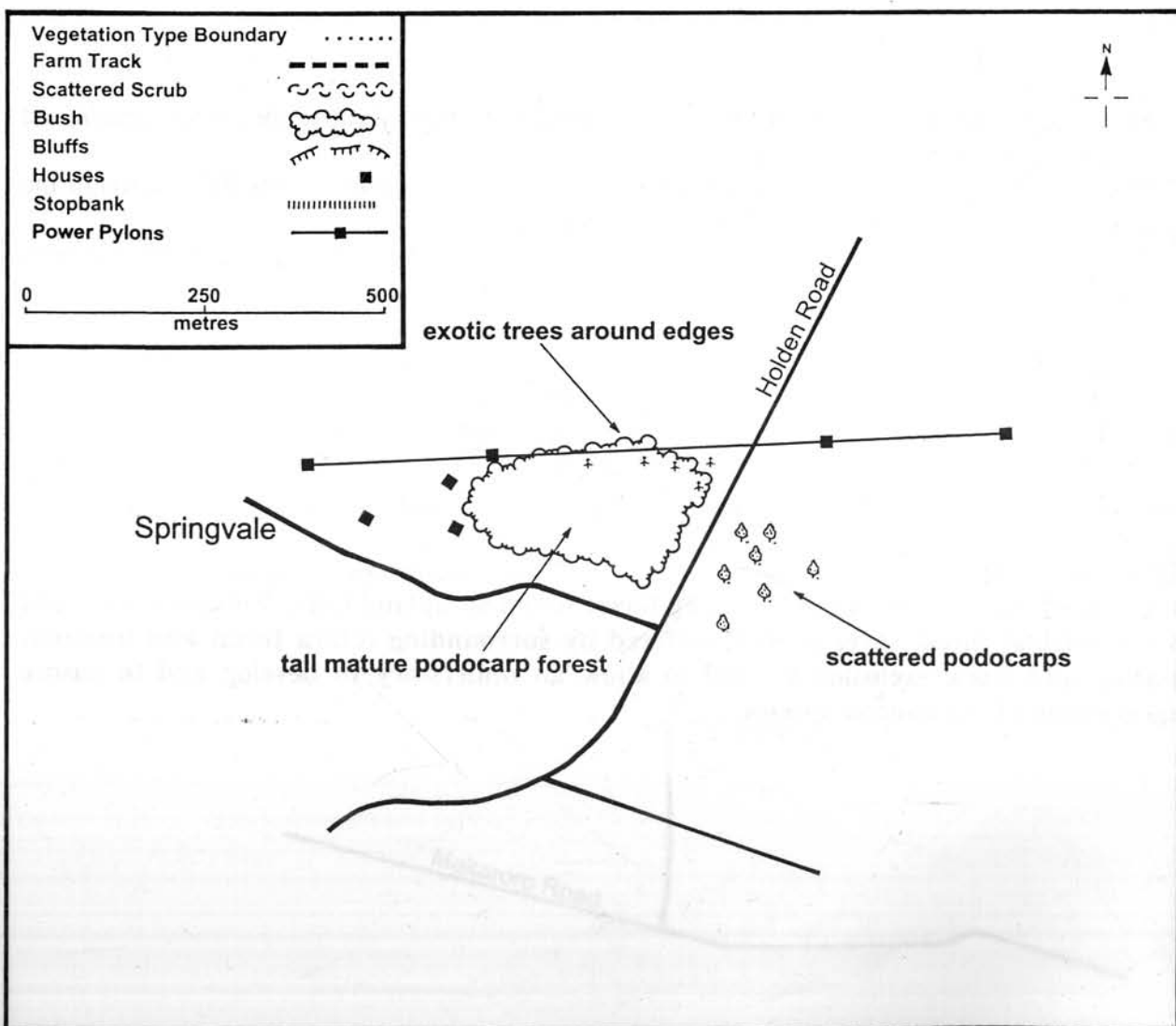
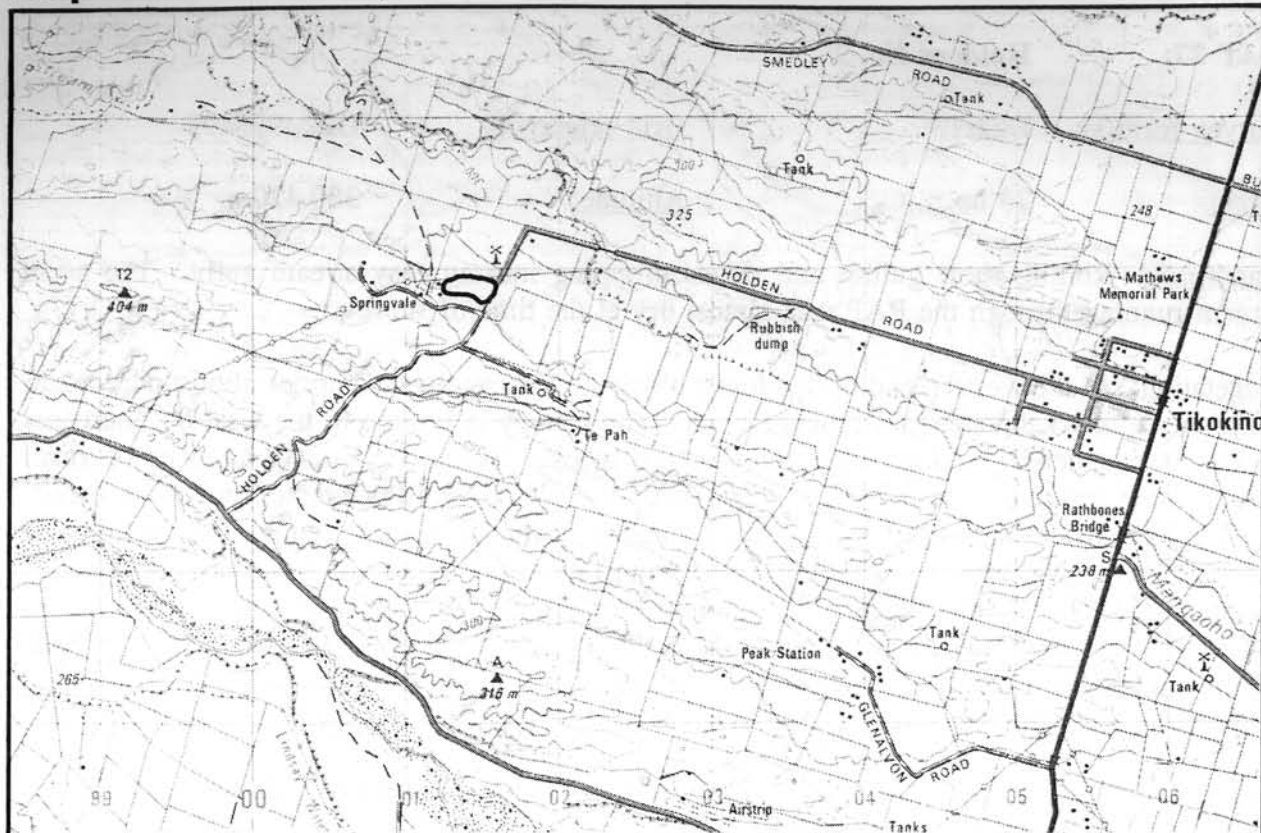
Buffering M

Naturalness M

Fragility and Threat M

Significance: M

One of the better stands of tall podocarp forest found on upland hills. This small remnant of the original forest cover is well buffered by surrounding totara forest and treeland. Fencing and stock exclusion is vital to allow an understory to develop and to ensure regeneration of the canopy species.



RAP 28: Holdens Bush

Survey form(s): U22/8 Grid reference: U22, 015488

Area: 4.5 ha Altitude: 300m

Landform: Cut by small meandering stream trenched 1½-2m deep, this RAP is located on a broad, flat plain of deep alluvial gravels. The small stream was almost dry at the time of inspection.

Vegetation: A small remnant pocket of tall mixed podocarp forest, somehow left untouched during felling of the surrounding forest. The tallest trees are large totara, kahikatea and matai, some up to 2m DBH, and below these the canopy contains large tawa and titoki, with lemonwood, mapou, mahoe and cabbage trees forming a subcanopy up to ~10m tall. The understory is very limited and it comprises mainly browsed mahoe and low ferns with a few small tree seedlings of titoki and mahoe on the forest floor, mostly below 30cm tall. Exotic trees including pine, eucalyptus and poplar grow around the perimeter of this remnant.

Fauna: Cattle are grazed in the area, probably only occasionally. Some of the more common bush birds inhabit this area but it is unlikely anything unusual or rare is present.

Cultural: No archaeological sites are recorded.

Modifiers/Threats:

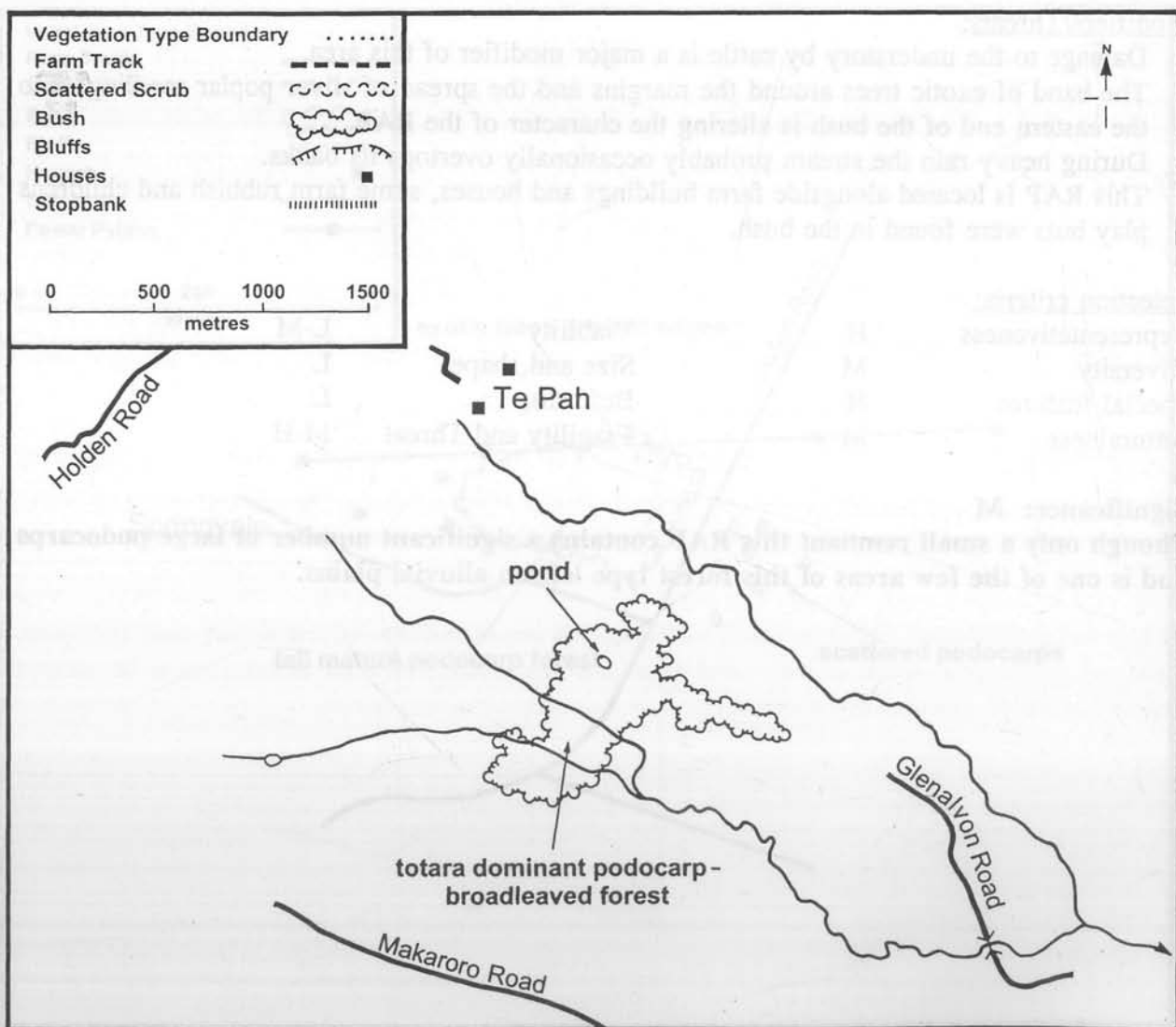
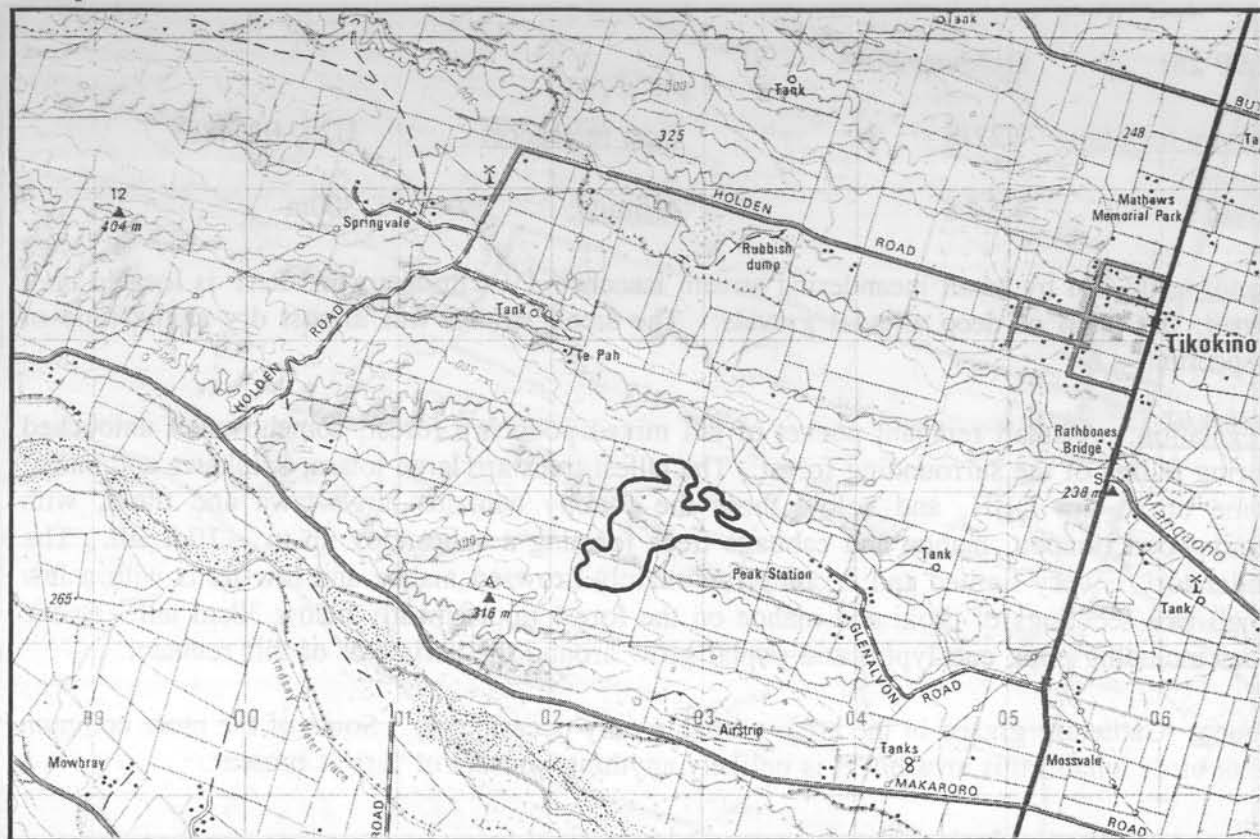
- Damage to the understory by cattle is a major modifier of this area.
- The band of exotic trees around the margins and the spread of silver poplar seedlings into the eastern end of the bush is altering the character of the RAP.
- During heavy rain the stream probably occasionally overtops its banks.
- This RAP is located alongside farm buildings and houses, some farm rubbish and childrens play huts were found in the bush.

Selection criteria:

Representativeness	H	Viability	L-M
Diversity	M	Size and shape	L
Special features	H	Buffering	L
Naturalness	M	Fragility and Threat	M-H

Significance: M

Though only a small remnant this RAP contains a significant number of large podocarps and is one of the few areas of this forest type left on alluvial plains.



RAP 29: Te Pah

Survey form(s): U22/4 Grid reference: U22, 025466

Area: 38 ha Altitude: 260-300m

Landform: Rolling hill country underlain by deep gravels. A small stream cuts through this bush but was dry at the time of survey.

Vegetation: The vegetation of this RAP is totara dominant podocarp-broadleaved forest of ~ 15-20m height. The most common tree after totara is titoki with lesser numbers of other broadleaved trees including rewarewa, mahoe, lancewood, fuchsia, kaikomako and pigeonwood scattered throughout. A few large kahikatea and matai are present, some emerging from the canopy, but most of the large trees have been logged in the past. There are a few dense stands of almost pure totara up to ~ 40cm DBH and quite straight. *Coprosma rotundifolia*, rohutu and mapou form a subcanopy in places. Before recent fencing this block was regularly grazed and therefore has only a sparse understory of small-leaved *Coprosma spp* and low ferns. Regeneration of the understory should be rapid following this fencing and stock exclusion.

Fauna: Possums are present in moderate numbers. Domestic stock are now excluded from this area. Common bush and pasture birds are present, though nothing unusual is likely.

Cultural: No archaeological sites are recorded.

Modifiers/Threats:

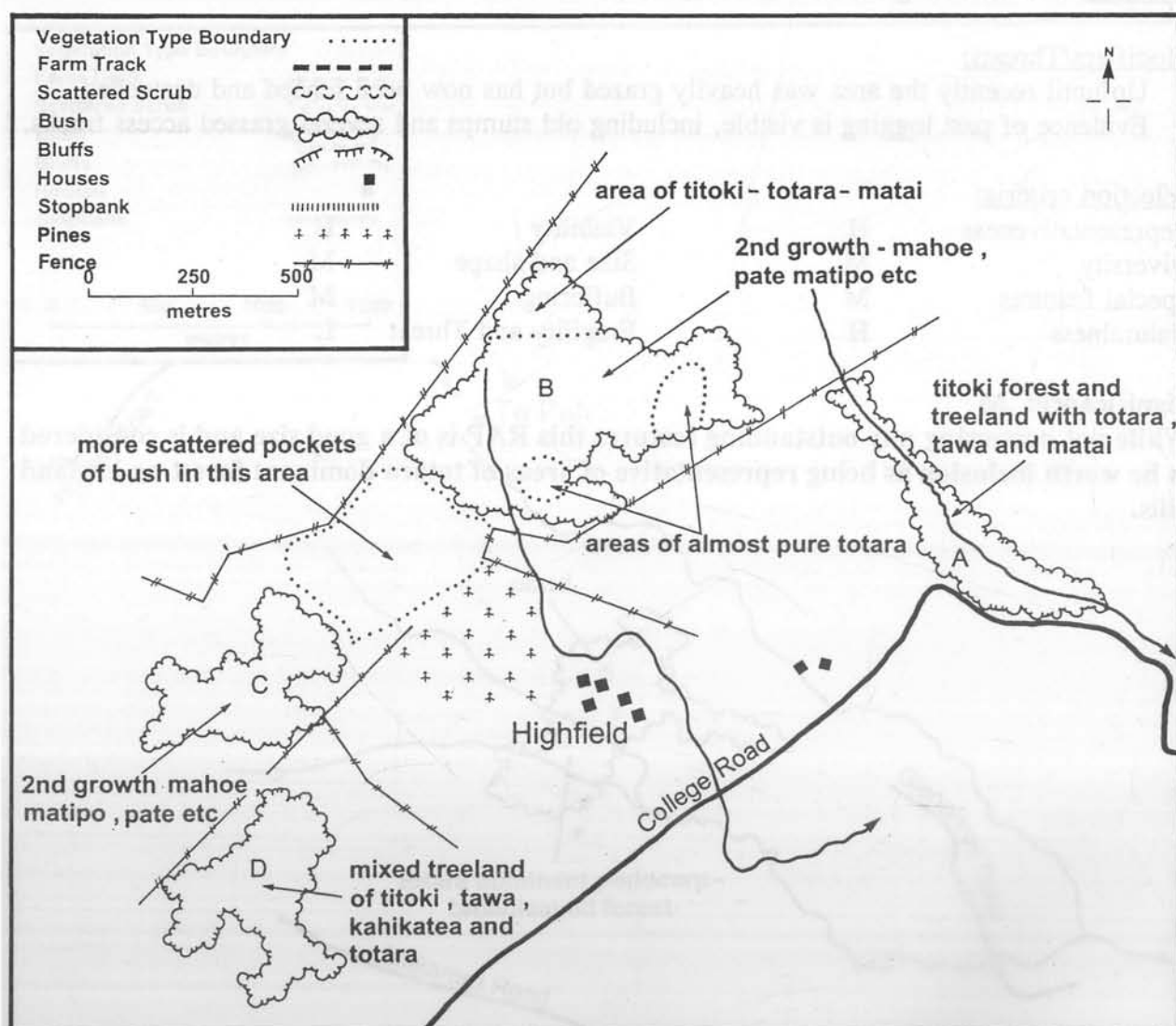
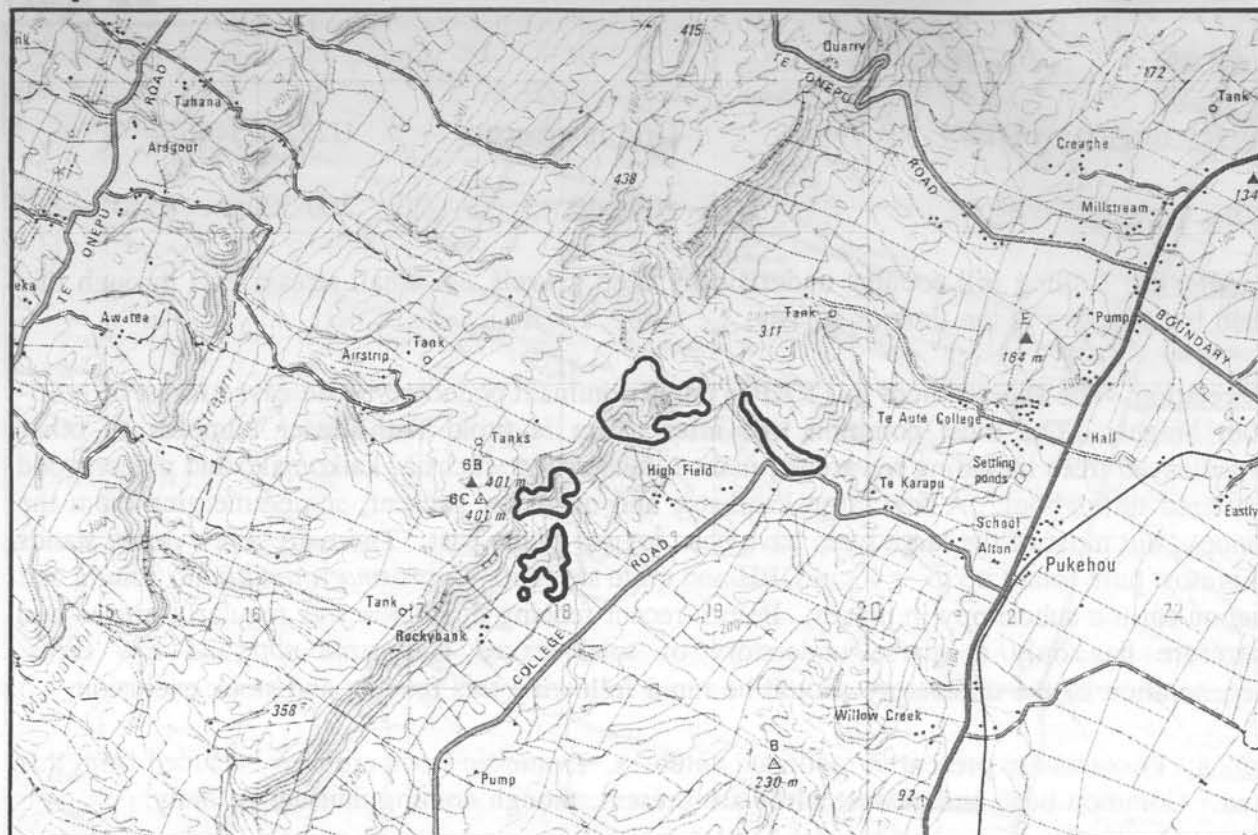
- Up until recently the area was heavily grazed but has now been fenced and destocked.
- Evidence of past logging is visible, including old stumps and several grassed access tracks.

Selection criteria:

Representativeness	H	Viability	H
Diversity	M	Size and shape	M
Special features	M	Buffering	M
Naturalness	H	Fragility and Threat	L

Significance: M

While not possessing any outstanding features this RAP is of a good size and is considered to be worth inclusion as being representative of areas of totara dominant forest on lowland hills.



RAP 30: Highfield

Survey form(s): V22/7 Grid reference: V22, 195467

Area: 42 ha Altitude: 260-360m

Landform: This RAP is located on the eastern side of the Raukawa Range and comprises two areas of gullies and spurs high on the range, a steep sided gully, and an area of easier slopes. Limestone bluffs and outcrops are a prominent feature of the higher parts of the range.

Vegetation:

Area A: Predominantly titoki forest and treeland with a few totara, tawa, matai, mahoe and ngaio scattered throughout. This area has a canopy height of 15-20m and an understory of dense thickets of tree nettle and low ferns.

Areas B & C: Mainly second growth trees such as mahoe, pate, mapou and lacebark with a canopy height of 10-15m, broken by a few small grassy clearings. There are a few emergent totara and matai and two small stands of almost pure totara are located on ridges. In the northern section of this area on top of the range is a flat area of titoki-totara-matai forest. The understory of Areas B and C is moderate and is dominated by kawakawa, supplejack, tree nettle and ferns.

Area D: A stand of open titoki, kahikatea, totara and matai which is grazed and has no understory. A pocket of regenerating kahikatea is found on a small wet area within this treeland.

Fauna: Goats in moderate numbers were seen in the bush and on surrounding land, and possums are present in moderate numbers. All blocks are grazed, A and D most intensively. The usual common bush and pasture birds are present.

Cultural: No archaeological sites are recorded.

Modifiers/Threats:

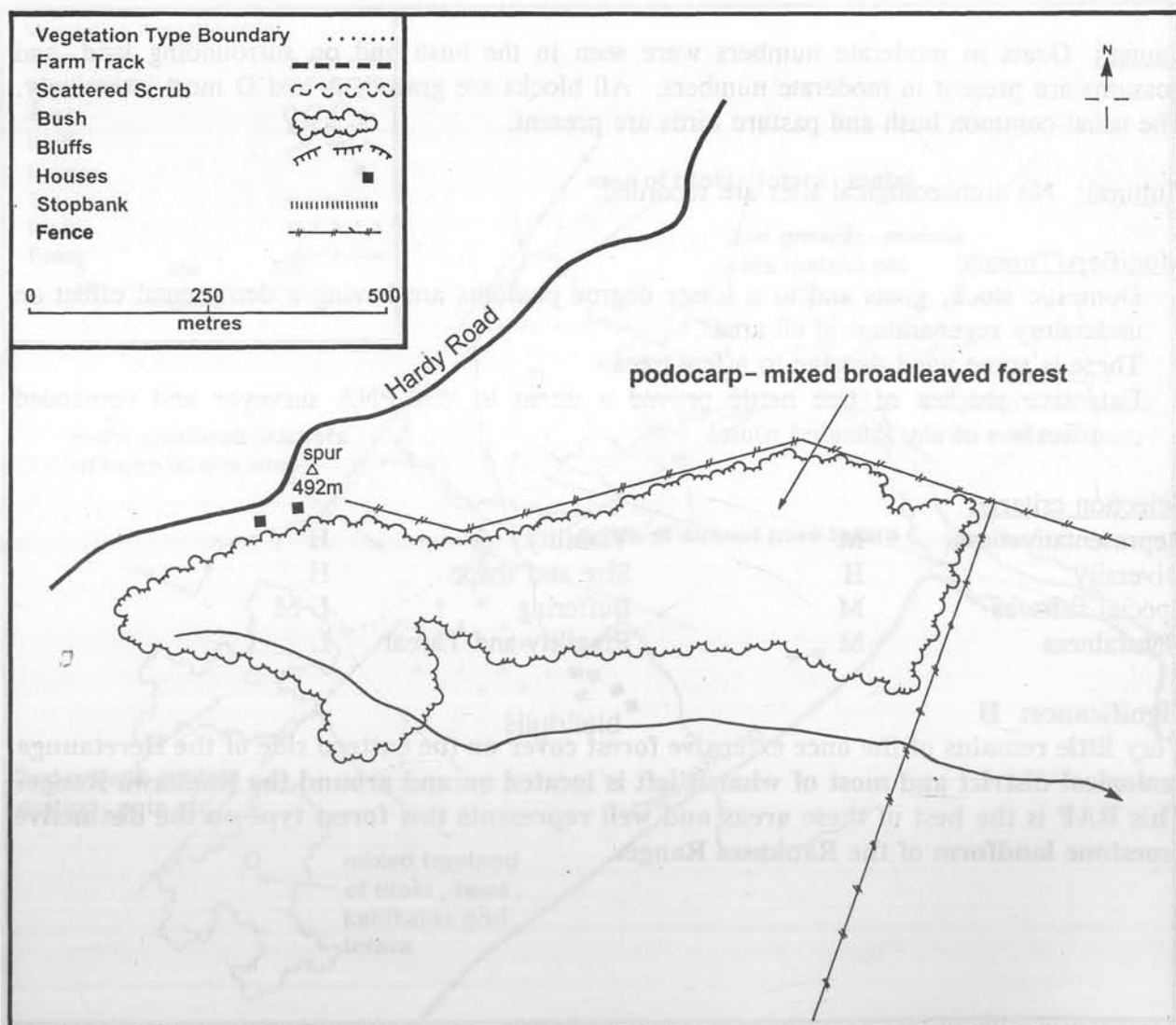
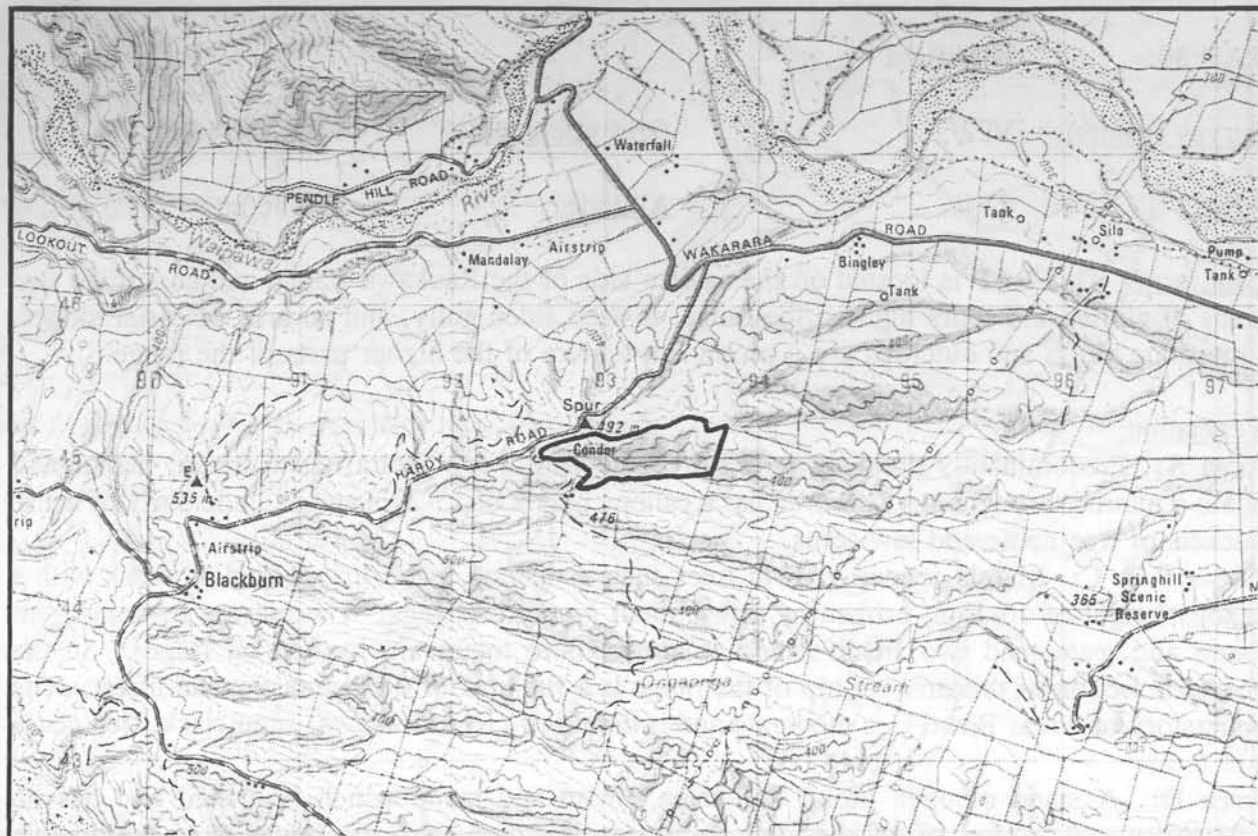
- Domestic stock, goats and to a lesser degree possums are having a detrimental effect on understory regeneration in all areas.
- There is some wind damage to a few trees.
- Extensive patches of tree nettle proved a threat to this PNA surveyor and demanded modification of my intended route!

Selection criteria:

Representativeness	M	Viability	H
Diversity	H	Size and shape	H
Special features	M	Buffering	L-M
Naturalness	M	Fragility and Threat	L

Significance: H

Very little remains of the once extensive forest cover on the eastern side of the Heretaunga ecological district and most of what is left is located on and around the Raukawa Range. This RAP is the best of these areas and well represents this forest type on the distinctive limestone landform of the Raukawa Range.



RAP 31: Condor

Survey form(s): U22/21 Grid reference: U22, 932451

Area: 30ha Altitude: 420-480m

Landform: An easy to moderately steep face dropping into a small stream gully.

Vegetation: Podocarp-mixed broadleaved forest. Totara is the dominant podocarp and constitutes ~25% of the canopy. While there are few rimu and matai present, no kahikatea were seen. Rewarewa, titoki and mahoe are all commonly found and lesser numbers of marbleleaf, black maire, hinau and cabbage trees were also present. A closed canopy of ~15-20m tall covers the area and there is an open to moderate understory dominated by small leaf *Coprosma spp*, mahoe, small totaras and ferns. On the ground is a healthy cover of herbs, low ferns, seedlings and leaf litter. Although this area has been fenced for several years some browse was noted, either cattle or deer.

Fauna: Possums and maybe the odd deer inhabit this area, cattle may occasionally find their way in. High numbers of tuis were seen and most common bush birds are probably here. An SSWI rating of potential is given to this habitat.

Cultural: No archaeological sites are recorded.

Modifiers/Threats:

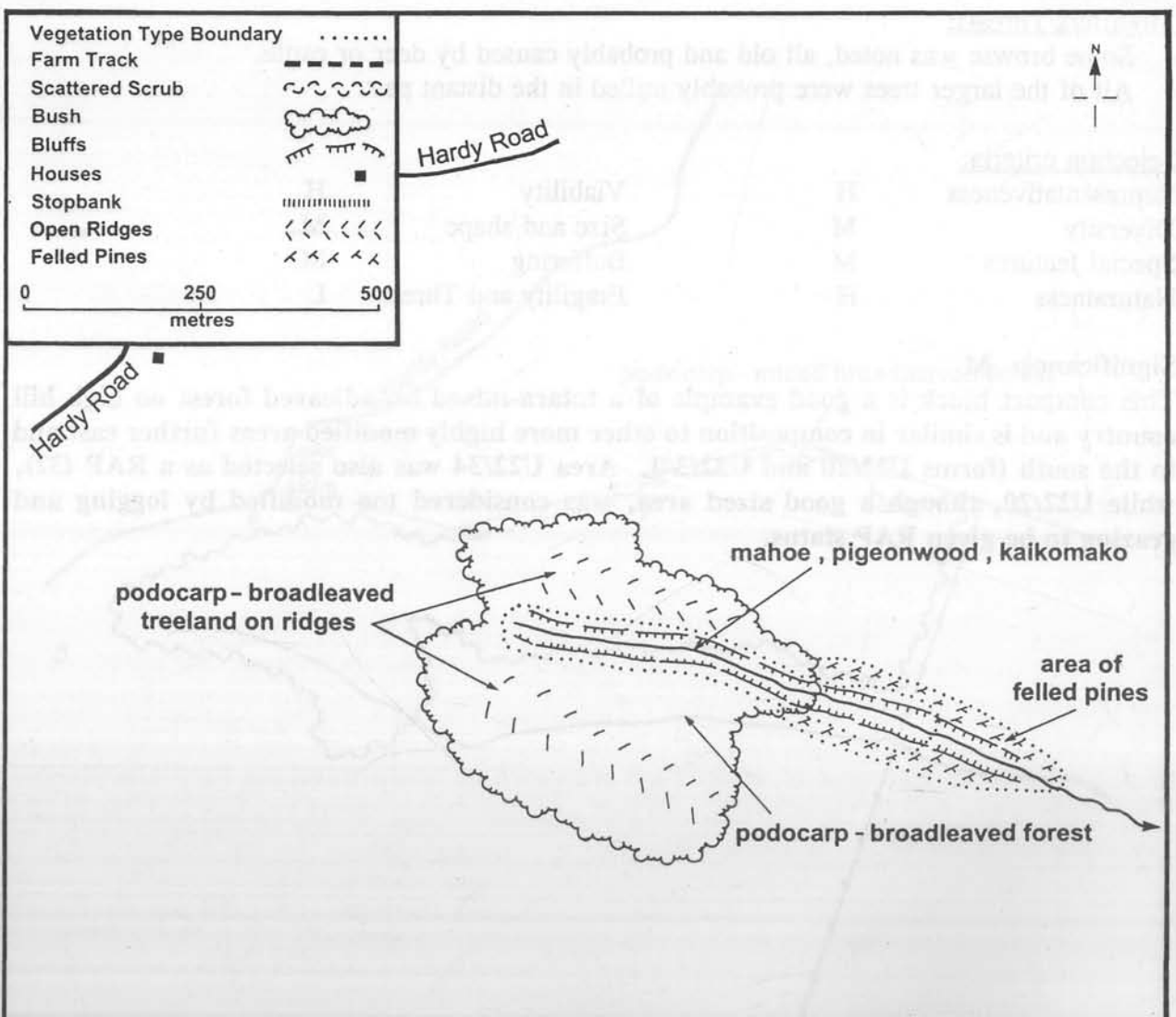
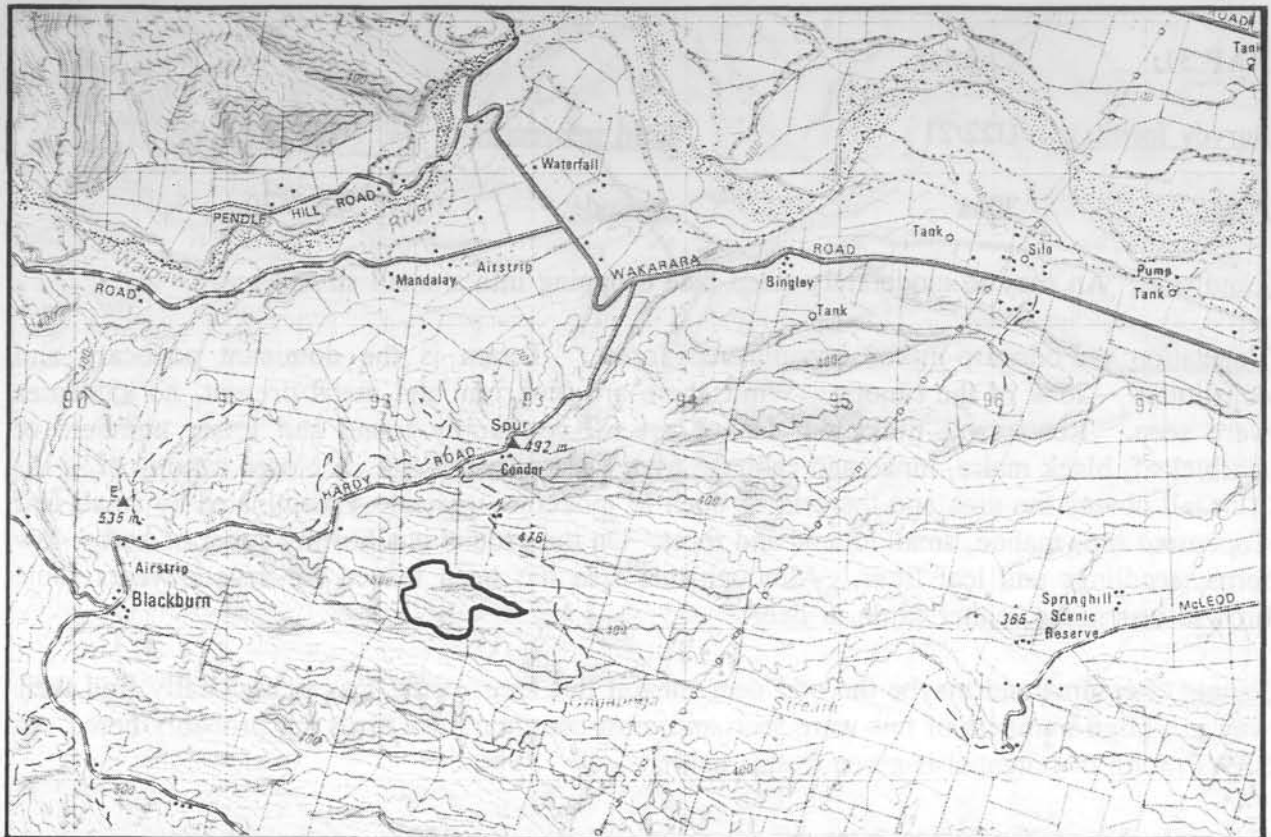
- Some browse was noted, all old and probably caused by deer or cattle.
- All of the larger trees were probably milled in the distant past.

Selection criteria:

Representativeness	H	Viability	H
Diversity	M	Size and shape	M
Special features	M	Buffering	M
Naturalness	H	Fragility and Threat	L

Significance: M

This compact block is a good example of a totara-mixed broadleaved forest on high hill country and is similar in composition to other more highly modified areas further east and to the south (forms U22/20 and U22/34). Area U22/34 was also selected as a RAP (32), while U22/20, though a good sized area, was considered too modified by logging and grazing to be given RAP status.



RAP 32: Worsnops

Survey form(s): U22/34 Grid reference: U22, 924443

Area: 20ha Altitude: 440-500m

Landform: Located in the head of the Ongaonga stream, this RAP consists of two easy ridges dropping into moderate to steep sided small gullies. At the bottom of one gully is a narrow, vertical sided dry gulch ~30m wide by 20m deep.

Vegetation: Podocarp-broadleaved forest and treeland. Totara is the dominant podocarp and some very large trees are present, some up to ~20m DBH and 25m tall. There are also a few large matai and rimu and some smaller kahikatea. Many large rewarewa emerge through a canopy of pigeonwood, mahoe, marbleleaf and kaikomako with a variable height ranging from 8 to 20m. On the open ridges the understory is generally sparse but it becomes more diverse in the interior of the bush and on the steep gully sides where stock do not have access. At the lower end of the RAP in the stream gorge a small plantation of radiata pine has recently been felled and a low canopy of predominantly mahoe is present.

Fauna: Domestic stock range through all of the RAP with the exception of the steep gorge. Common bush birds are present, nothing unusual or rare is recorded.

Cultural: No archaeological sites are recorded.

Modifiers/Threats:

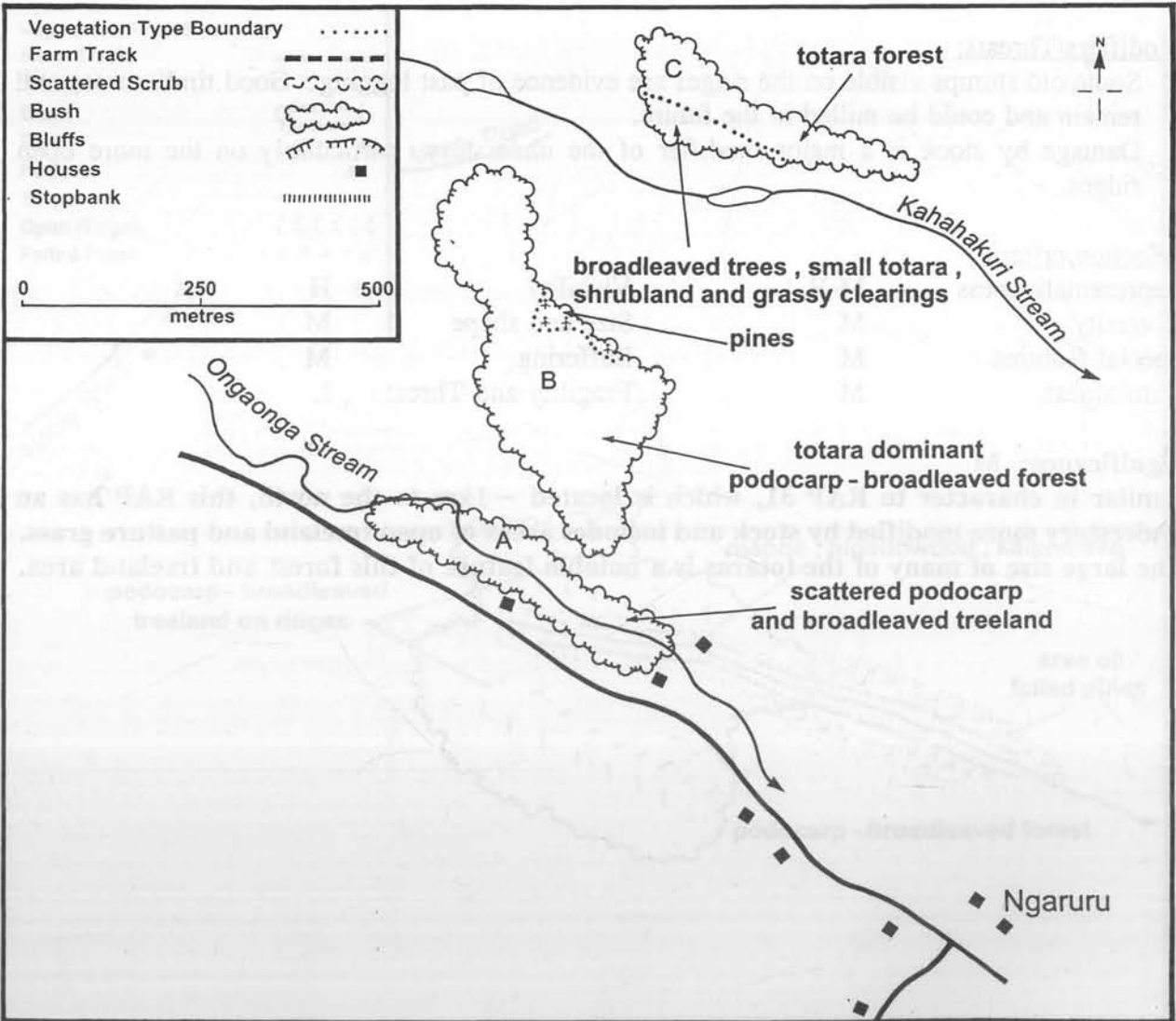
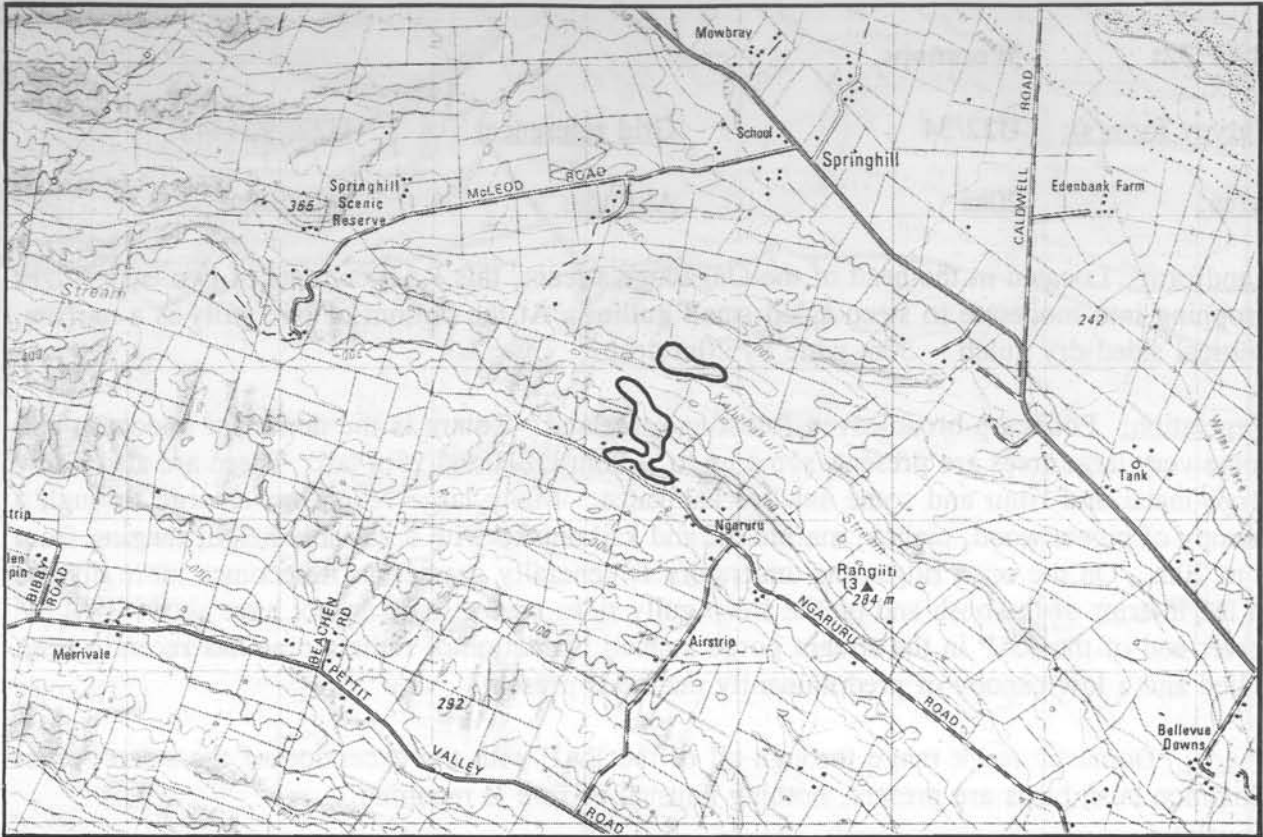
- Some old stumps visible on the ridges are evidence of past logging. Good timber trees still remain and could be milled in the future.
- Damage by stock is a major modifier of the understory, particularly on the more open ridges.

Selection criteria:

Representativeness	M-H	Viability	H
Diversity	M	Size and shape	M
Special features	M	Buffering	M
Naturalness	M	Fragility and Threat	L

Significance: M

Similar in character to RAP 31, which is located ~1km to the north, this RAP has an understory more modified by stock and includes areas of open treeland and pasture grass. The large size of many of the totaras is a notable feature of this forest and treeland area.



RAP 33: Gunsons

Survey form(s): U22/35 Grid reference: U22, 985426
Area: 14.5ha Altitude: 260-320m

Landform: Area A of this RAP is on a broad valley bottom while Areas B and C are on south facing slopes of rolling, stony hill country typical of the topography west of State Highway 50 near Ongaonga.

Vegetation:

Area A - Podocarp-broadleaved treeland. Kahikatea, totara and matai, with a few titoki, black maire and cabbage trees. One large pokaka and a few large kahikatea and matai up to ~1.5m DBH were seen. Stock grazing has destroyed the understory, and in many places also the ground cover.

Area B - Totara dominant podocarp-broadleaved forest. This area is the pick of the three and has been fenced for ~25 years. 80% of the canopy is totara, generally 30-50cm DBH, but with a few trees up to ~1m DBH. Matai and titoki are also common in the canopy, and a healthy subcanopy of small broadleaved trees is present. Ranging from ground level up to the subcanopy is a moderate to dense trees understory of mahoe, *Coprosma areolata*, hangehange, kawakawa and ferns. There is good regeneration of tree seedlings and the forest floor has a good cover of climbing rata, small ferns, herbs and leaf litter.

Area C - Predominantly totara, this block does not have the diversity of species of block B. Due to heavy grazing by stock the understory is far less dense. A band of smaller totaras, some broadleaved trees, small-leaved *Coprosma spp* and grassy clearings sits at the base of this area.

Fauna: Domestic stock are grazed in Areas A and C but not in Area B. The usual common bush birds are present but nothing unusual or rare is reported.

Cultural: No archaeological sites are recorded.

Modifiers/Threats:

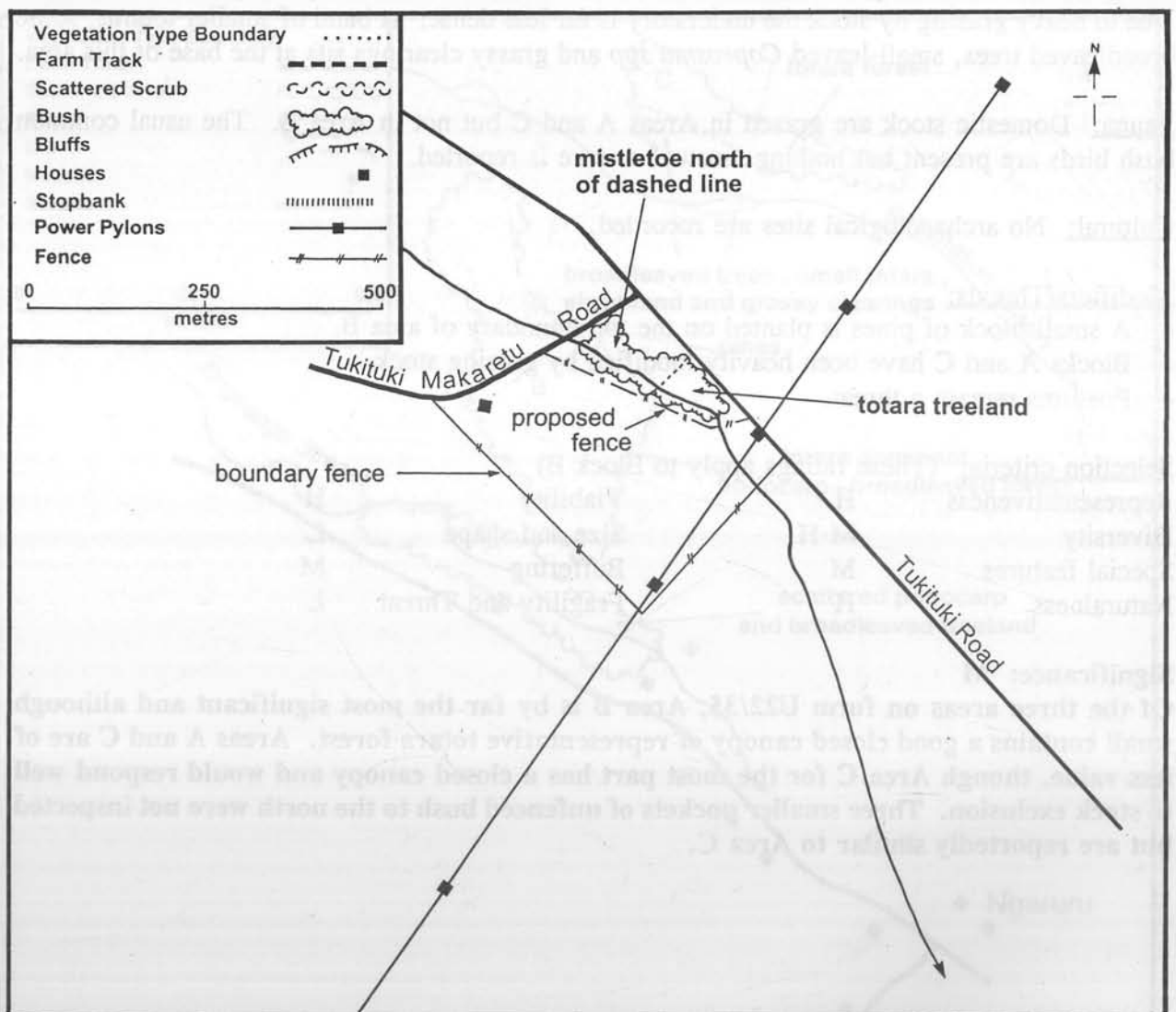
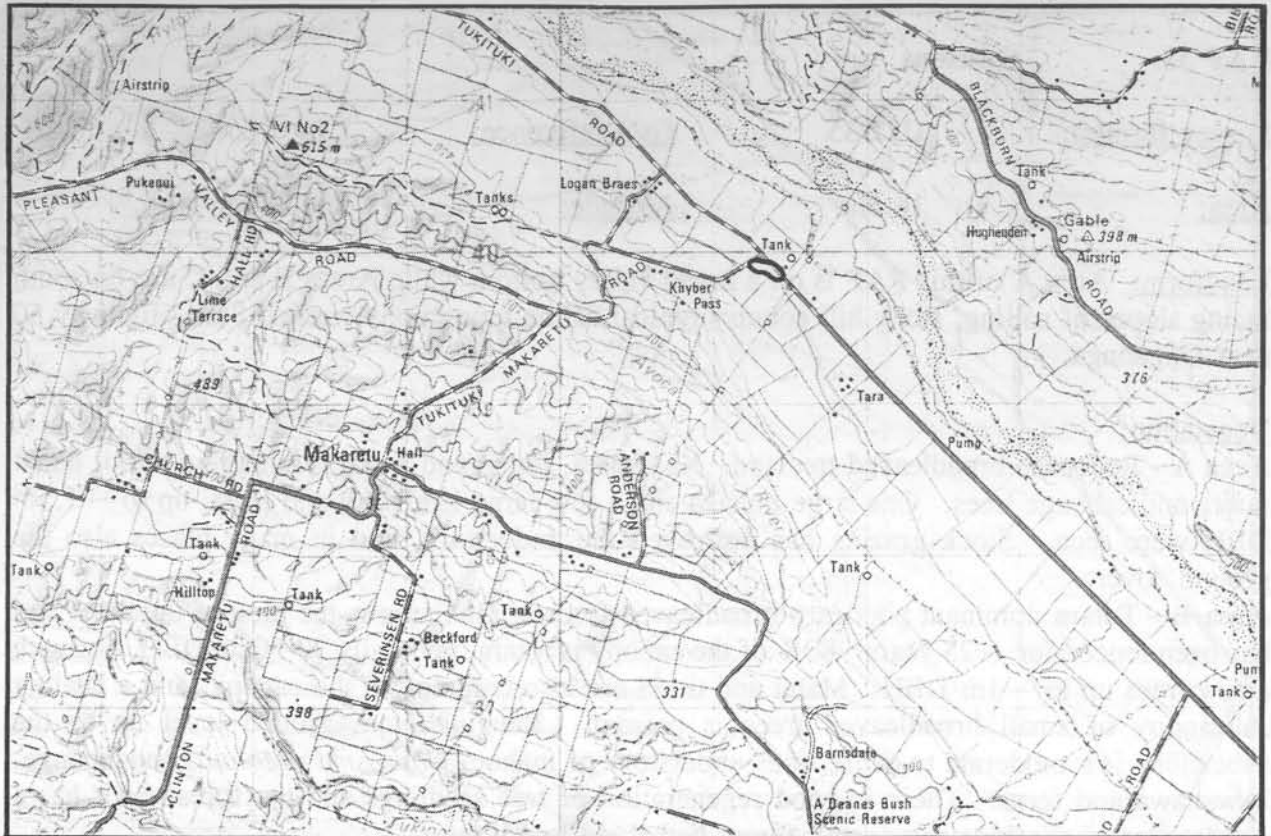
- A small block of pines is planted on the top boundary of area B.
- Blocks A and C have been heavily modified by grazing stock.
- Possums remain a threat.

Selection criteria: (These ratings apply to Block B)

Representativeness	H	Viability	H
Diversity	M-H	Size and shape	L
Special features	M	Buffering	M
Naturalness	H	Fragility and Threat	L

Significance: M

Of the three areas on form U22/35, Area B is by far the most significant and although small contains a good closed canopy of representative totara forest. Areas A and C are of less value, though Area C for the most part has a closed canopy and would respond well to stock exclusion. Three smaller pockets of unfenced bush to the north were not inspected but are reportedly similar to Area C.



RAP 34: Kyber Pass

Survey form(s): U22/24 Grid reference: U22, 914 399

Area: 2.5 ha Altitude: 320m

Landform: This RAP sits on a broad alluvial terrace of the Tukituki River approximately 30 metres above and ½km distant from the river. A small, almost dry stream flows across the terrace and through the RAP.

Vegetation: A treeland of almost pure totara, mostly spreading trees 50-100cm DBH and ~12-14m tall, with occasional kowhai and cabbage trees and one small black maire. There is no understory and ground cover consists entirely of pasture grasses and a few pasture weeds.

The feature giving this RAP its significance is the mistletoe *Ileostylus micranthus*, common in the spreading totaras within this small, otherwise uninteresting treeland. The mistletoe grows from cattle browse level up to the higher branches and many trees support 4 or 5 healthy plants up to ~1.5m spread. Though the surrounding areas of treeland were searched no further plants were located and it appears the mistletoe is restricted to this small pocket adjacent to the road.

Fauna: Possums must be present, at least in low numbers, but seem to be having minimal effect on the mistletoe plants. Domestic stock are intensively grazed throughout the block. Common pasture birds and a few bush birds, including tui, are present.

Cultural: No archaeological sites are recorded.

Modifiers/Threats:

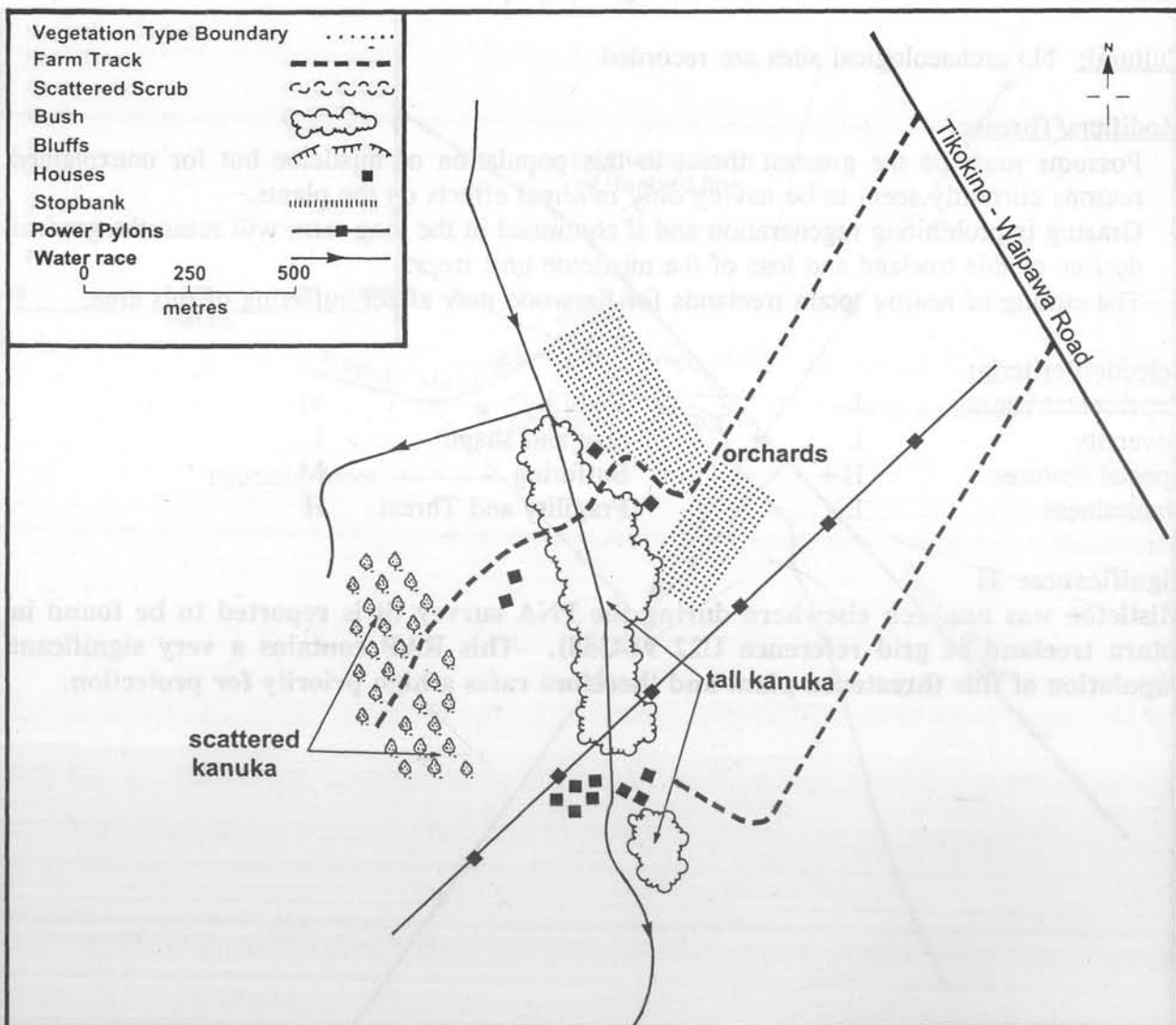
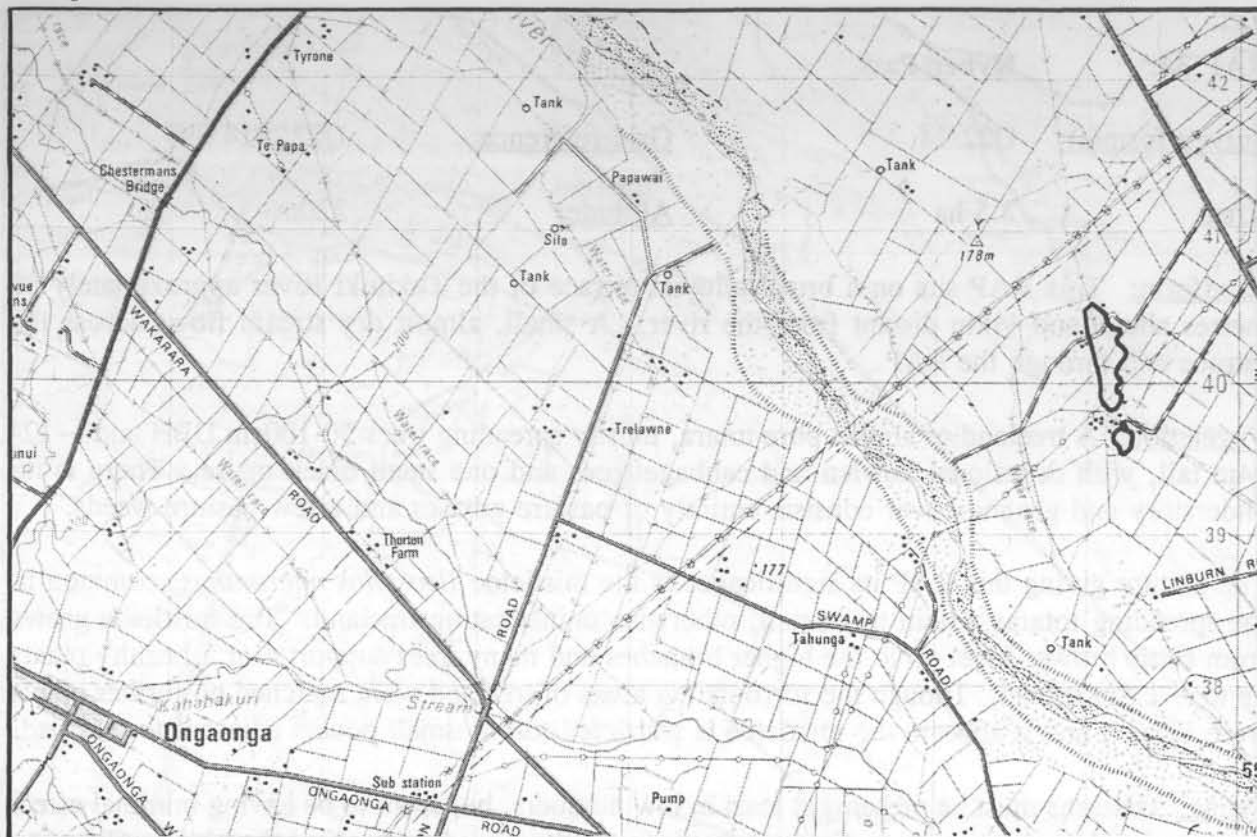
- Possums must be the greatest threat to this population of mistletoe but for unexplained reasons currently seem to be having only minimal effects on the plants.
- Grazing is prohibiting regeneration and if continued in the long term will mean the gradual decline of this treeland and loss of the mistletoe host trees.
- The cutting of nearby totara treelands for firewood may affect buffering of this area.

Selection criteria:

Representativeness	L	Viability	M
Diversity	L	Size and shape	L
Special features	H+	Buffering	M
Naturalness	L	Fragility and Threat	H

Significance: H

Mistletoe was not seen elsewhere during the PNA survey (it is reported to be found in totara treeland at grid reference U22 914368). This RAP contains a very significant population of this threatened plant and therefore rates a high priority for protection.



RAP 35: Eastern Equities

Survey form(s): U22/31

Grid reference:

U22, 091401

Area: 12 ha

Altitude:

180m

Landform: The flat and stony Ruataniwha plains surround this RAP. A narrow, straight and muddy water race flows the length of the area and the braided bed of the Waipawa River lies approximately 1km to the southwest.

Vegetation: Pure kanuka treeland. This stand of pure kanuka of 20-40cm DBH and 15-18m tall stands out in a locality of predominantly exotic trees and pastureland. Unfortunately stock have been intensively grazed in the block for many years and any understory that may have once been present has been totally destroyed. During the field survey of this area (limited to 1/4 of this area only, due to access problems) no other native plants were seen, though various exotic trees are growing around the perimeter. A ground cover of closely grazed pasture grasses occurs under the open canopy and in places cattle have ringbarked many of the kanuka, killing some.

Fauna: This RAP is contained mostly within deer fences and is intensively grazed by both deer and cattle. Bush birds are unlikely to be present but most common pasture birds are probably found here. There are unlikely to be any fish in the water race.

Cultural: No archaeological sites are recorded.

Modifiers/Threats:

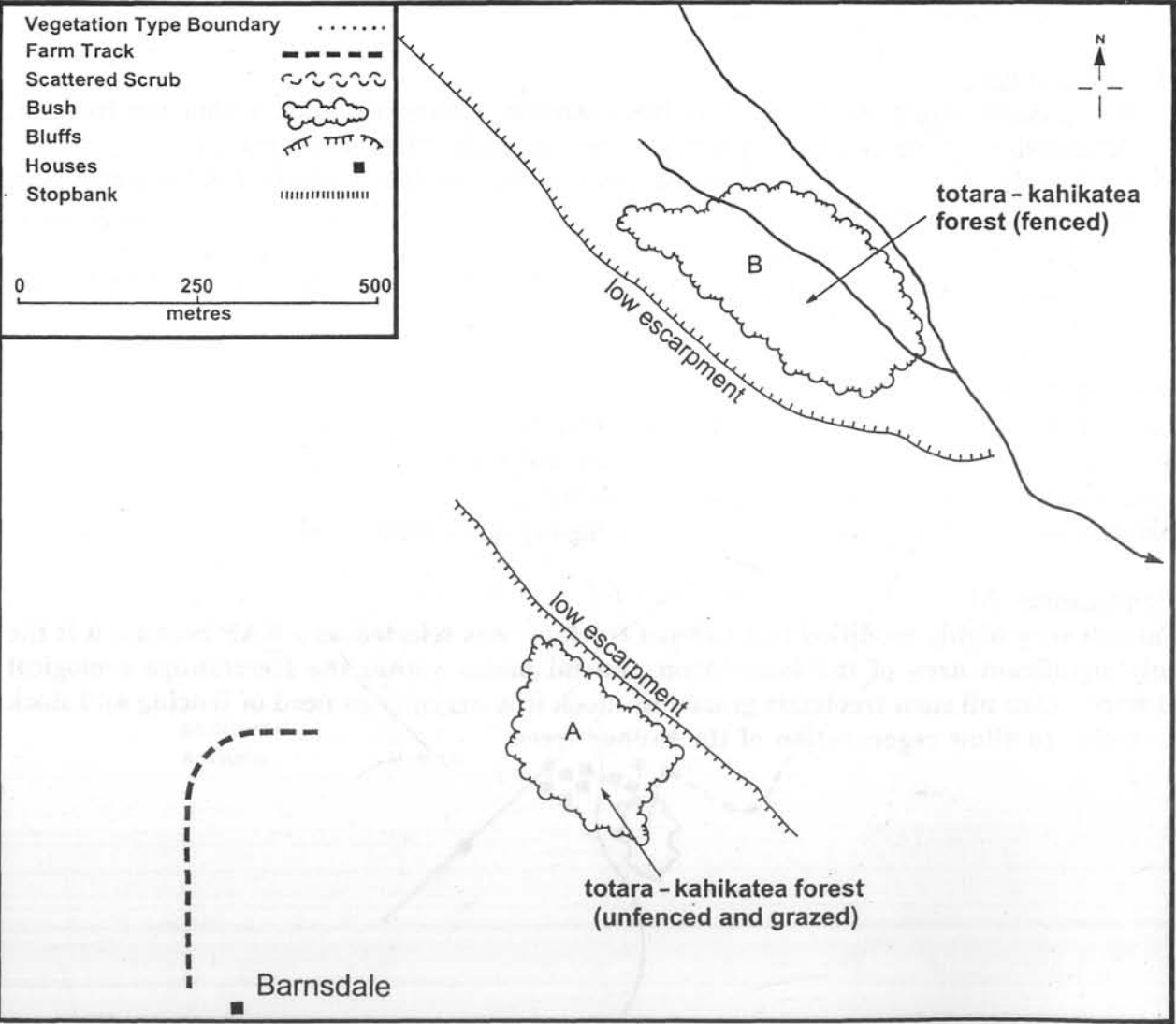
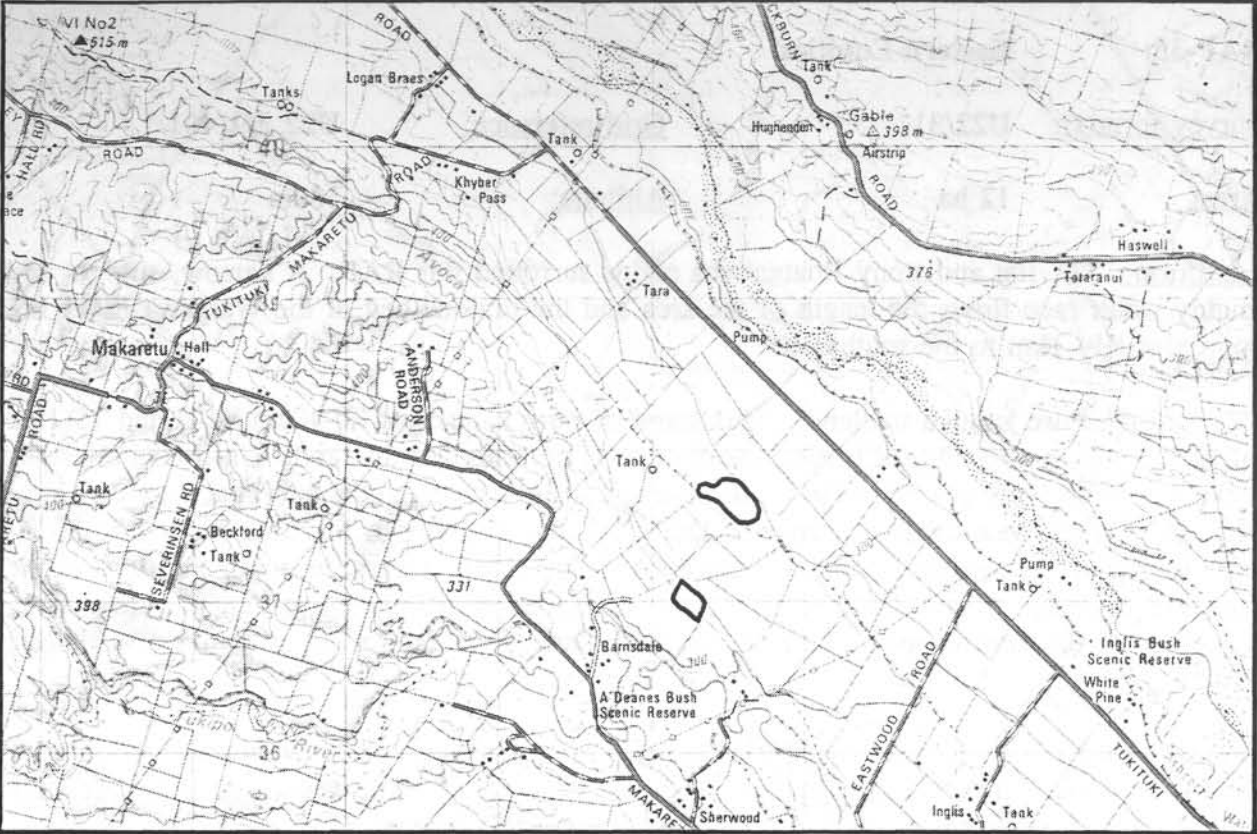
- The greatest threat to this area is the intensive grazing of stock within the treeland. Regeneration of kanuka is nil and some trees are being killed by ringbarking.
- Small scale cutting of firewood has occurred in the past but is reported to have now been prohibited by the manager.
- The water race is very obviously an artificial structure.
- Farm tracks, stock lanes, fences, power lines and sheds are all found within the RAP and detract from its naturalness.

Selection criteria:

Representativeness	M	Viability	M
Diversity	L	Size and shape	L
Special features	M	Buffering	L
Naturalness	L	Fragility and Threat	H

Significance: M

Though very highly modified this kanuka treeland was selected as a RAP because it is the only significant area of tall kanuka on alluvial plains within the Heretaunga ecological district. Like all such treelands grazed by stock it is urgently in need of fencing and stock exclusion to allow regeneration of the canopy trees.



RAP 36: Barnsdale

Survey form(s): U22/22

Grid reference: U22, 922370/925376

Area: 12 ha

Altitude: 300m

Landform: Both of these small pockets of bush are on broad terraces of Ruataniwha alluvial soils. Small escarpments rise alongside both areas and a small stream meanders through Area B.

Vegetation:

Area A - This is totara-kahikatea forest comprising ~45% totara and 45% kahikatea with a mix of other species including matai, tawa, titoki and rewarewa making up the remainder of the canopy. There are a few large kahikatea up to ~2m DBH but most trees are smaller, generally 30-60cm DBH. The canopy is closed over all of the area and though there is a sparse subcanopy of mahoe, small matai and totara there is almost no understory due to browsing stock. Visibility through this bush is about 80m.

Area B - This area contains similar height and size trees but with more kahikatea (80%) and less totara (10%). Other tree species, similar to those in Area A are spread throughout. This area is fenced and has not been intentionally grazed for about 30 years. While it is a similar forest type to Area A it is vastly different in the understory and subcanopy tiers, there being a moderate subcanopy of mahoe, mapou, pigeonwood and lemonwood and a moderate to dense understory of *Coprosma spp*, tree ferns, hangehange, rohutu and ferns. A healthy ground cover of seedlings, low ferns, hook-grass, herbs and leaf litter covers the ground. In contrast to Area A, visibility through this bush is generally less than 20m.

Fauna: Domestic stock are grazed throughout Area A. Some deer browse and sign was obvious in Area B and two deer were seen, probably farm escapees.

Common bush birds are found in both areas and it is possible that long-tailed bats, found in A'deanes Bush (~1km distant), are also found at these two sites.

Cultural: No archaeological sites are recorded.

Modifiers/Threats:

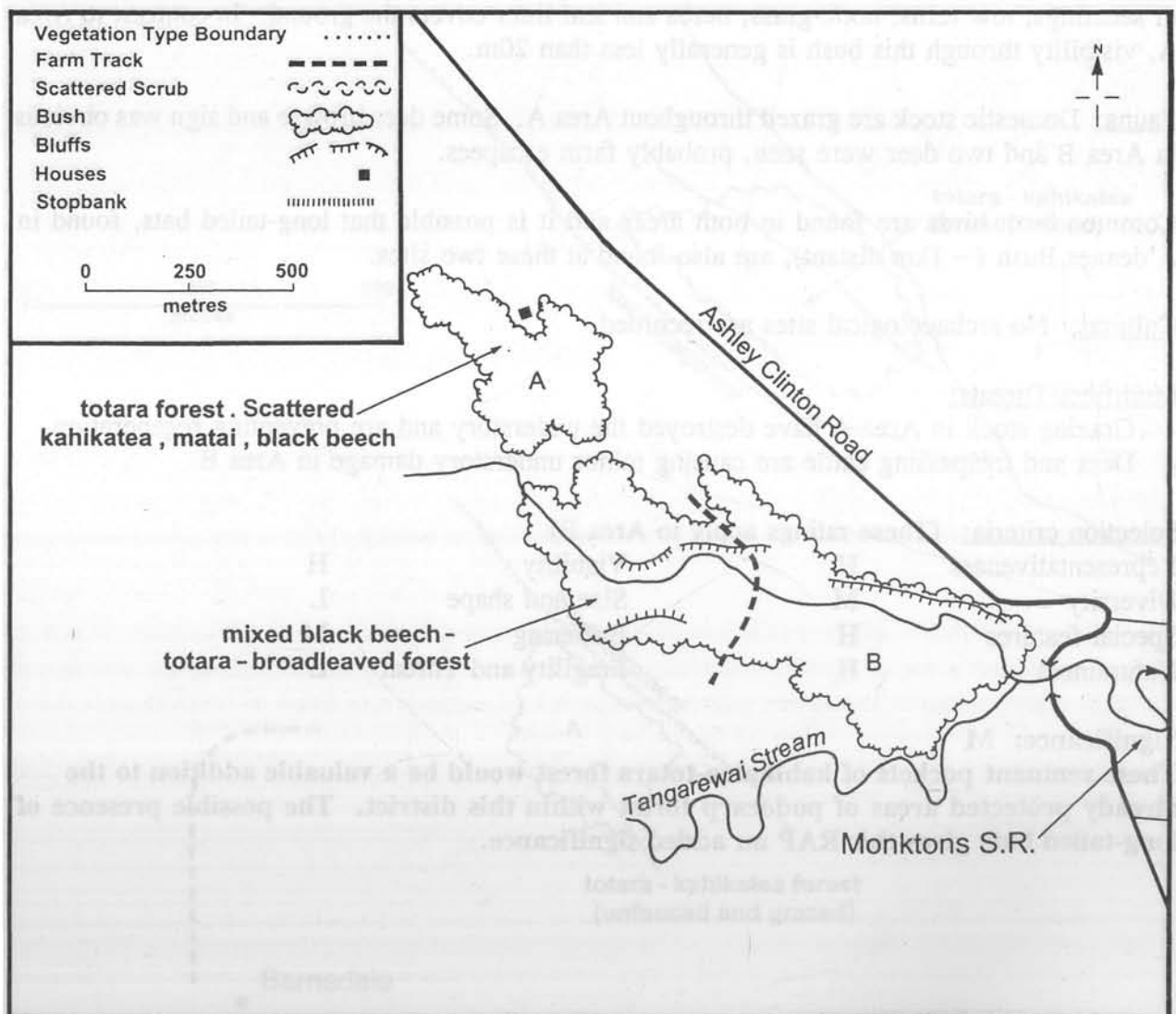
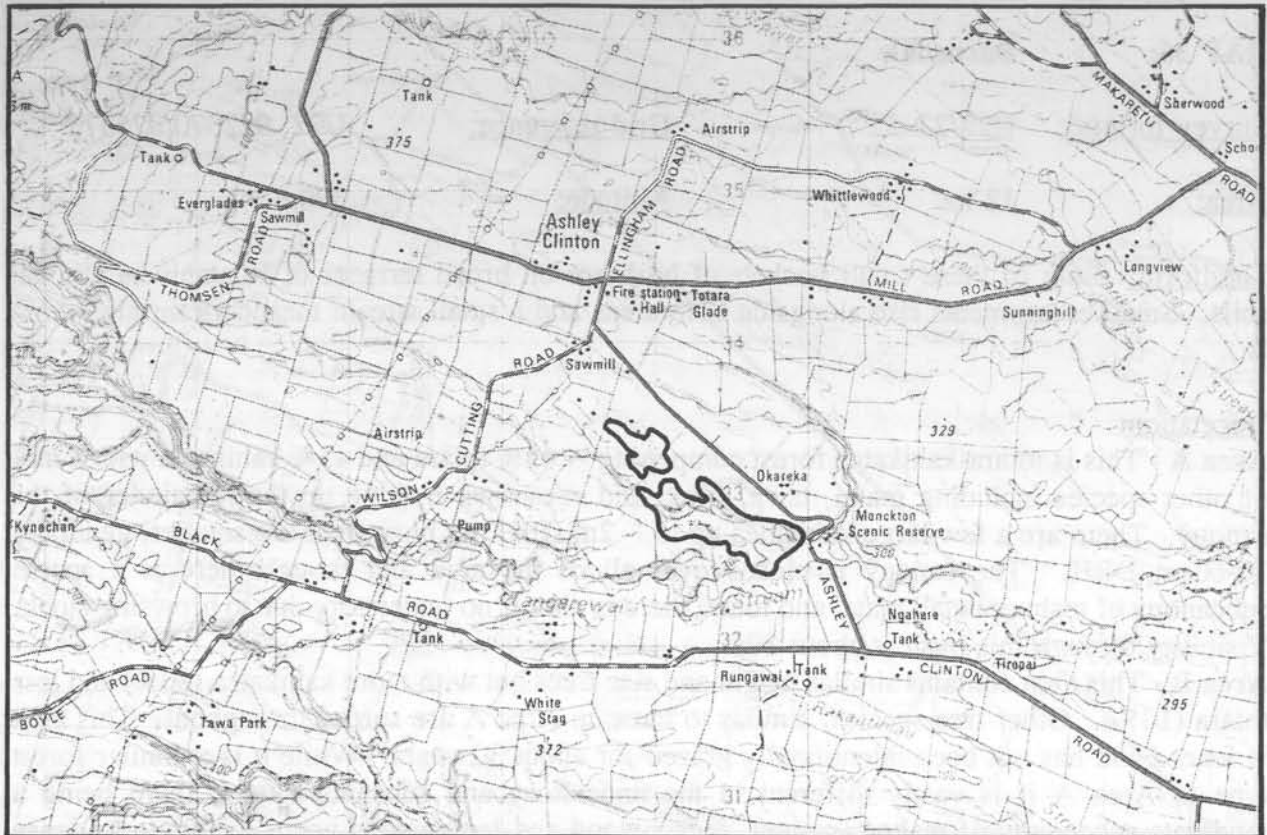
- Grazing stock in Area A have destroyed the understory and are preventing regeneration.
- Deer and trespassing cattle are causing minor understory damage in Area B.

Selection criteria: (These ratings apply to Area B)

Representativeness	H	Viability	H
Diversity	M	Size and shape	L
Special features	H	Buffering	M
Naturalness	H	Fragility and Threat	L

Significance: M

These remnant pockets of kahikatea-totara forest would be a valuable addition to the already protected areas of podocarp forest within this district. The possible presence of long-tailed bats gives this RAP an added significance.



RAP 37: Herricks

Survey form(s): U22/29

Grid reference: U22, 893329

Area: 39 ha

Altitude: 300-380m

Landform: This RAP is in two blocks, an area of rolling ridges and gullies and a steep sided stream gorge through which flows a small tributary of the Tangarewai Stream.

Vegetation:

Area A - 80% of the canopy of this area is totara, with a few kahikatea, matai, black beech and titoki. The canopy is closed and there is very little understory due to grazing by stock.

Area B - Black beech dominates this area and comprises ~60% of the canopy, with totara making up ~20%. The remainder is a mix of other tree species of which titoki, matai, rewarewa and kahikatea are common. In the steeper gullies smaller broadleaved trees such as mahoe, lemonwood, pate and fuchsia are dominant in the canopy. In many places there is a healthy subcanopy of regenerating totara and other small trees and the understory is moderate to dense on the steeper areas and near the centre of the block, becoming sparser on easy ground near the edges, probably due to occasional stock trespass. Overall this area has a very good diversity of plant species.

Fauna: Possums are present and moderate sign was seen. The track across the gorge is probably used for moving stock but only minimal sign of stock was seen in the bush area.

Common bush birds are present and long-tailed bats may be found here as they are recorded locally and the habitat seems suitable.

Cultural: No archaeological sites are recorded.

Modifiers/Threats:

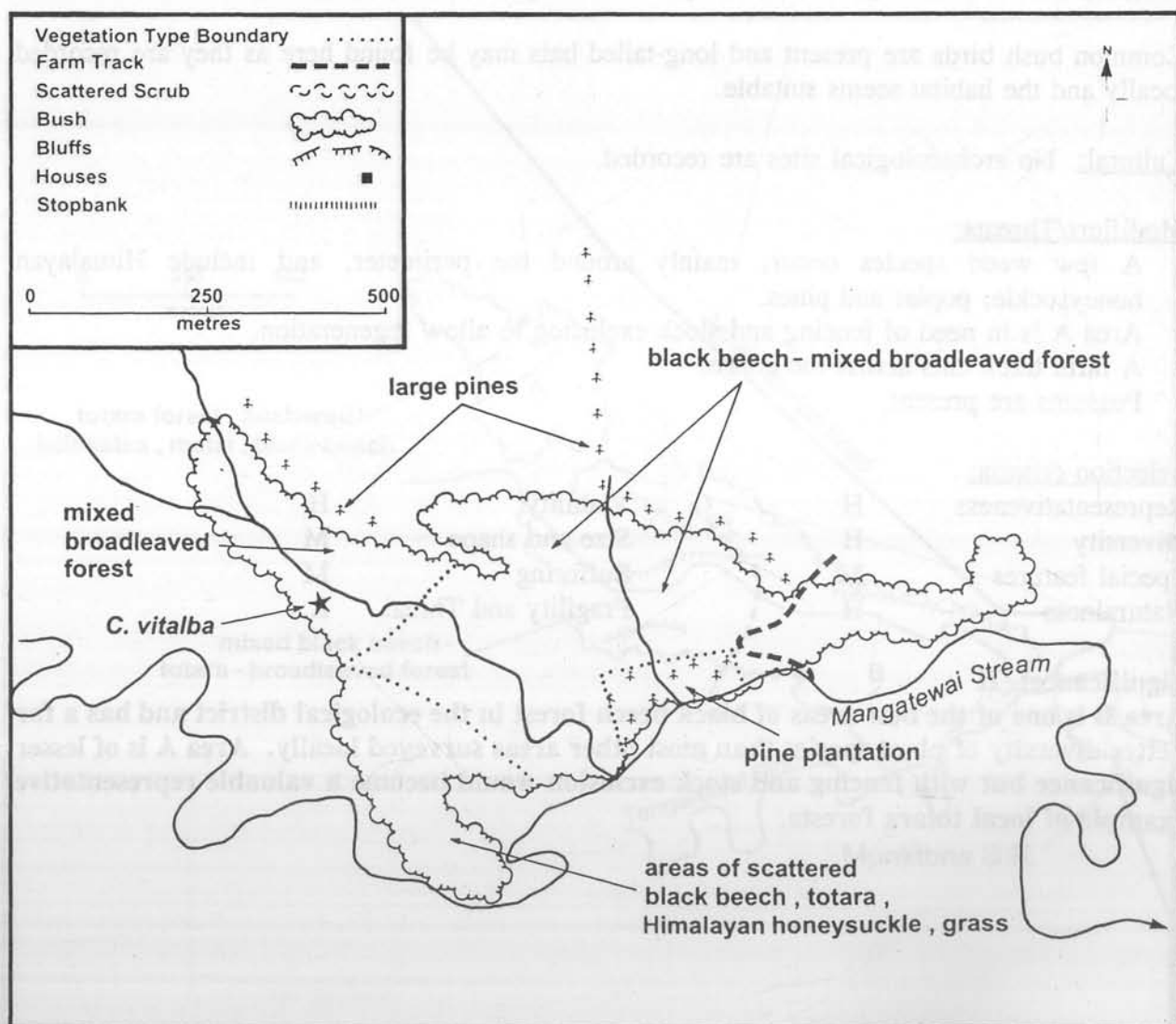
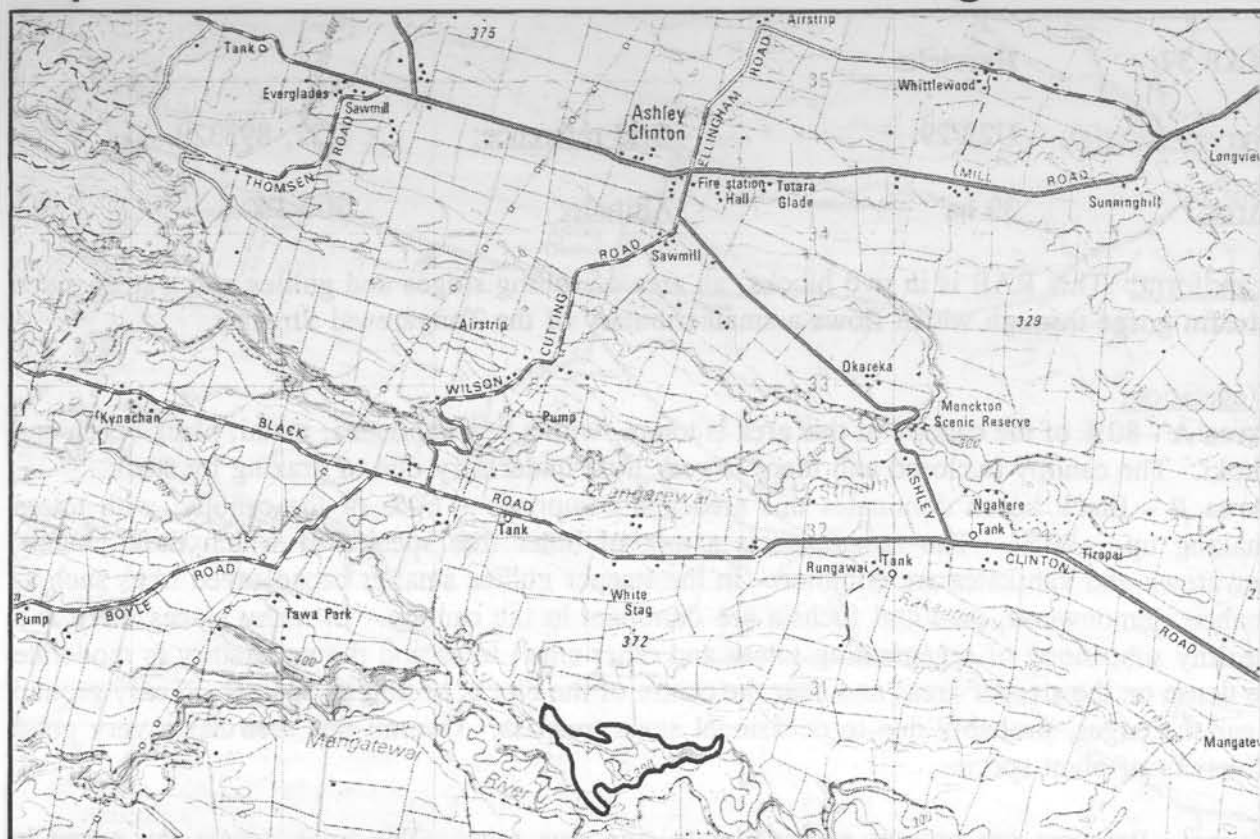
- A few weed species occur, mainly around the perimeter, and include Himalayan honeysuckle, poplar and pines.
- Area A is in need of fencing and stock exclusion to allow regeneration.
- A farm track cuts across the gorge.
- Possums are present.

Selection criteria:

Representativeness	H	Viability	H
Diversity	H	Size and shape	M
Special features	M	Buffering	M
Naturalness	H	Fragility and Threat	L

Significance: H

Area B is one of the best areas of black beech forest in the ecological district and has a far better diversity of plant species than most other areas surveyed locally. **Area A** is of lesser significance but with fencing and stock exclusion would become a valuable representative example of local totara forests.



RAP 38: Mangatewai River

Survey form(s): U22/30

Grid reference: U22, 883305

Area: 30 ha

Altitude: 300-350m

Landform: Located on the northern side of the Mangatewai River, this RAP contains steep faces and gullies on the upper slopes, with easier country nearer the river. A small tributary of the Mangatewai River flows through this RAP and at the downstream end of the RAP steep faces drop directly into the Mangatewai riverbed.

Vegetation: On the upper faces and ridges black beech is dominant, with occasional rewarewa, totara, tawa and kahikatea, while lower down a more even mix of these species occurs. In the tributary stream the canopy is comprised of smaller broadleaved trees such as mahoe, lemonwood, lacebark and mapou.

A diverse understory of shrubs, small trees, tree ferns, supplejack and low ferns is present over most of these areas. On the lower slopes the forest cover is more patchy and comprises pockets of black beech, totara, kowhai and cabbage trees interspersed with areas of grass and Himalayan honeysuckle.

Fauna: Goats have been shot in low numbers over the past few years but appear to be no longer present. Domestic stock are confined to the lower parts of the RAP. The usual common bush birds are present.

Cultural: No archaeological sites are recorded.

Modifiers/Threats:

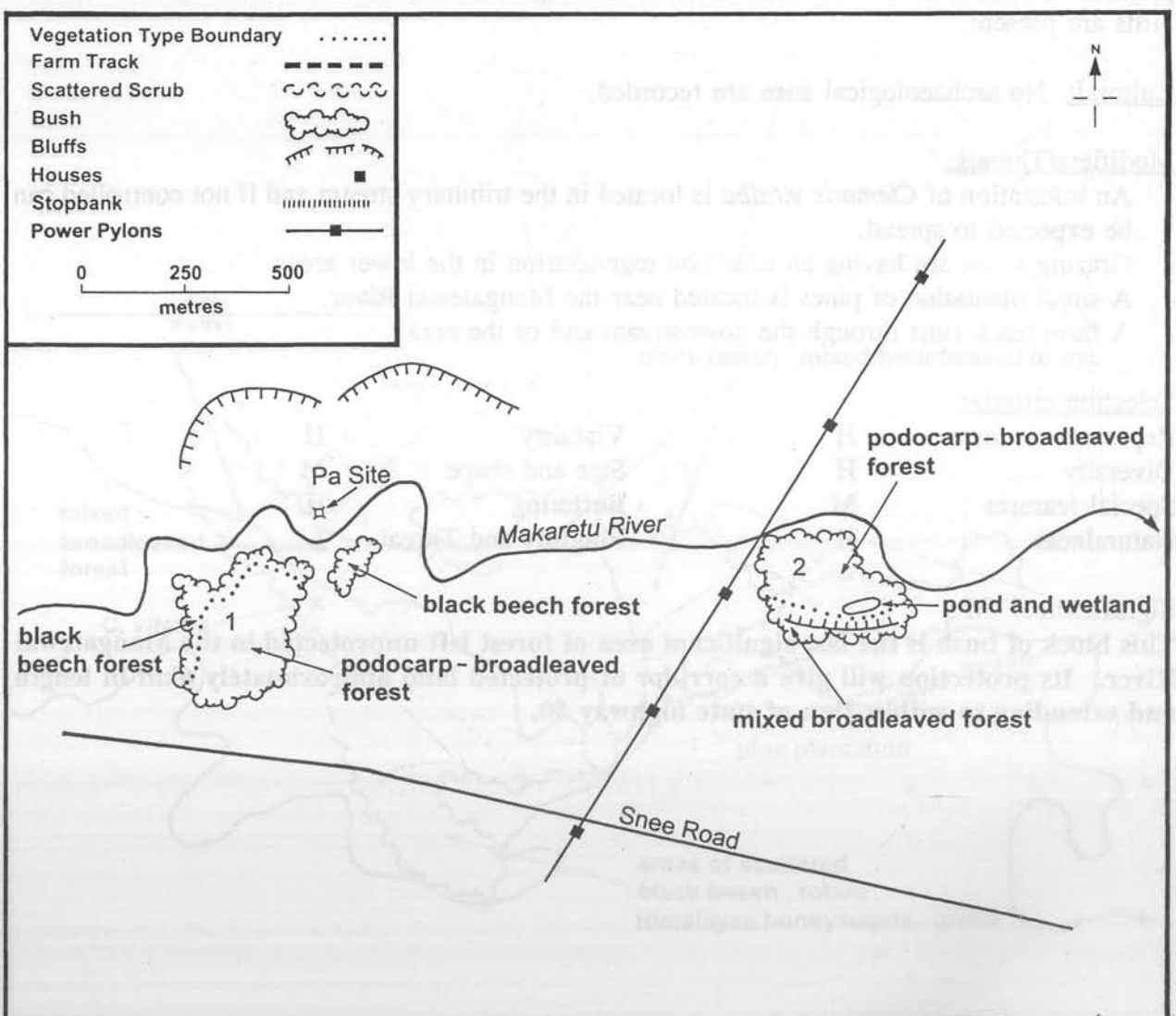
- An infestation of *Clematis vitalba* is located in the tributary stream and if not controlled can be expected to spread.
- Grazing stock are having an effect on regeneration in the lower areas.
- A small plantation of pines is located near the Mangatewai River.
- A farm track runs through the downstream end of the area.

Selection criteria:

Representativeness	H	Viability	H
Diversity	H	Size and shape	M
Special features	M	Buffering	H
Naturalness	H	Fragility and Threat	L

Significance: M

This block of bush is the last significant area of forest left unprotected in the Mangatewai River. Its protection will give a corridor of protected land approximately 6km in length and extending to within 2km of state highway 50.



RAP 39: Makaretu River

<u>Survey form(s):</u>	Area 1: U23/3	<u>Grid reference:</u>	Area 1: U23, 824282
	Area 2: U23/4		Area 1: U23, 838283
<u>Area:</u>	Area 1: 5ha	<u>Altitude:</u>	Area 1: 400m
	Area 2: 6ha		Area 2: 350-380m

Landform: The two areas of this RAP are a gentle rounded knoll dropping abruptly into the Makaretu River and a low alluvial terrace backed by a 30m high escarpment. A small wetland has formed on the terrace in Area 2.

Vegetation:

Area 1: Podocarp-broadleaved forest. Rewarewa is the dominant tree and comprises ~70% of the canopy, with kahikatea, rimu, matai and kamahi common. Kowhai, maire and kaikomako are scattered thinly throughout. A 30m wide band of black beech skirts the north and west sides of this area. Under the rewarewa canopy the understory is sparse, mostly regenerating rewarewa, supplejack and ferns, while the black beech has a moderate understorey of mingimingi, *Helichrysum lanceolatum* and small leaved *Coprosma* spp.

Area 2: Mixed podocarp-broadleaved forest covers the terrace with rewarewa again the dominant tree on drier sites. Kahikatea is common in wetter areas and a mix of other tree species including matai, cabbage tree, totara, mahoe and titoki form a closed canopy. On the escarpment a cover of mixed broadleaved species occurs, of which mahoe, kowhai, titoki and marbleleaf are common. Small pockets of black beech occur on the drier sites. The predominant vegetation of the wetland area is *Carex secta* and raupo, though a few small kahikatea and cabbage trees are present.

Fauna: Both areas have signs of domestic stock throughout. Common bush birds are present in the forest areas and a few waterfowl use the wetland.

Cultural: A pa site and terraces are located close to this area.

Modifiers/Threats:

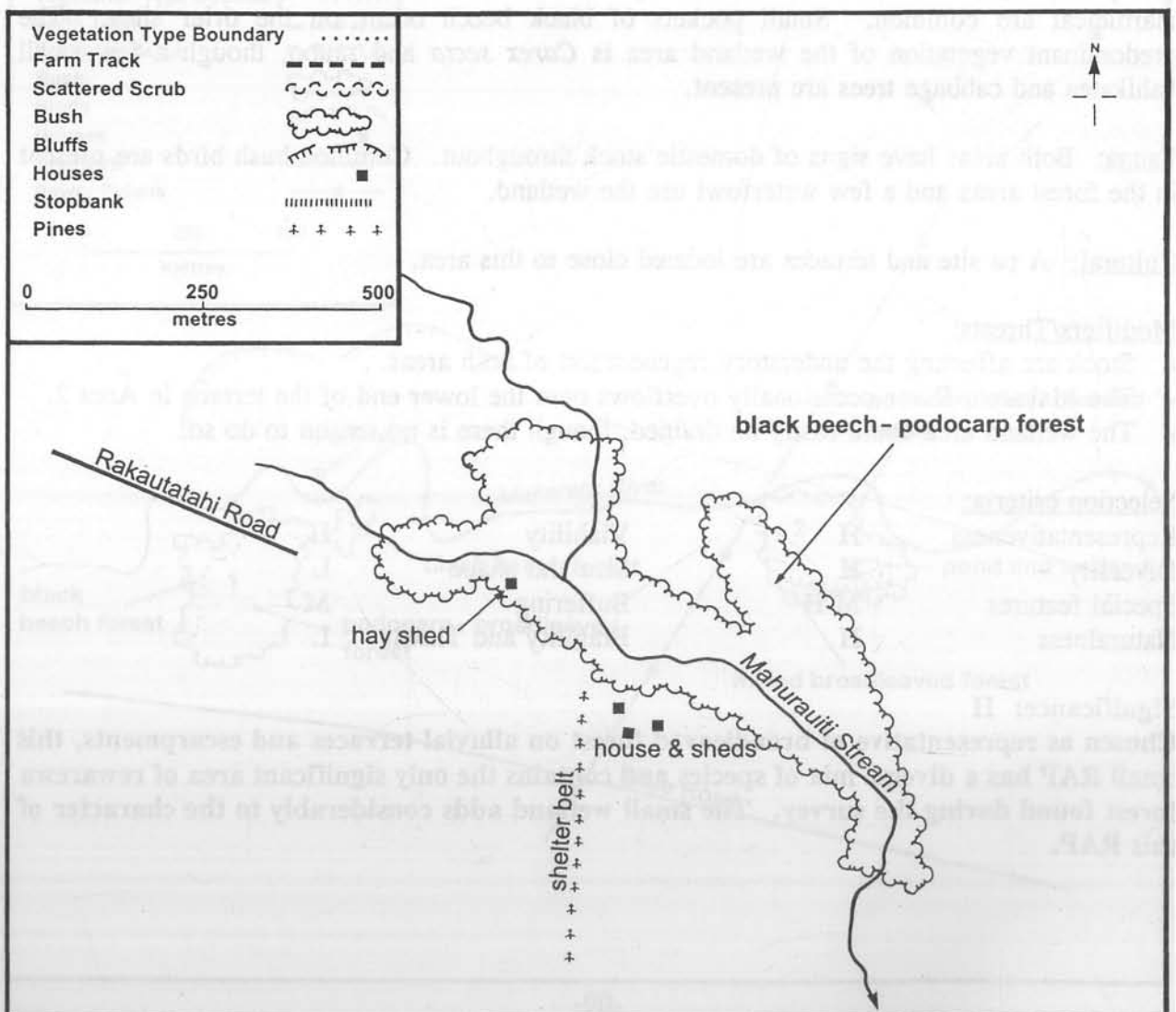
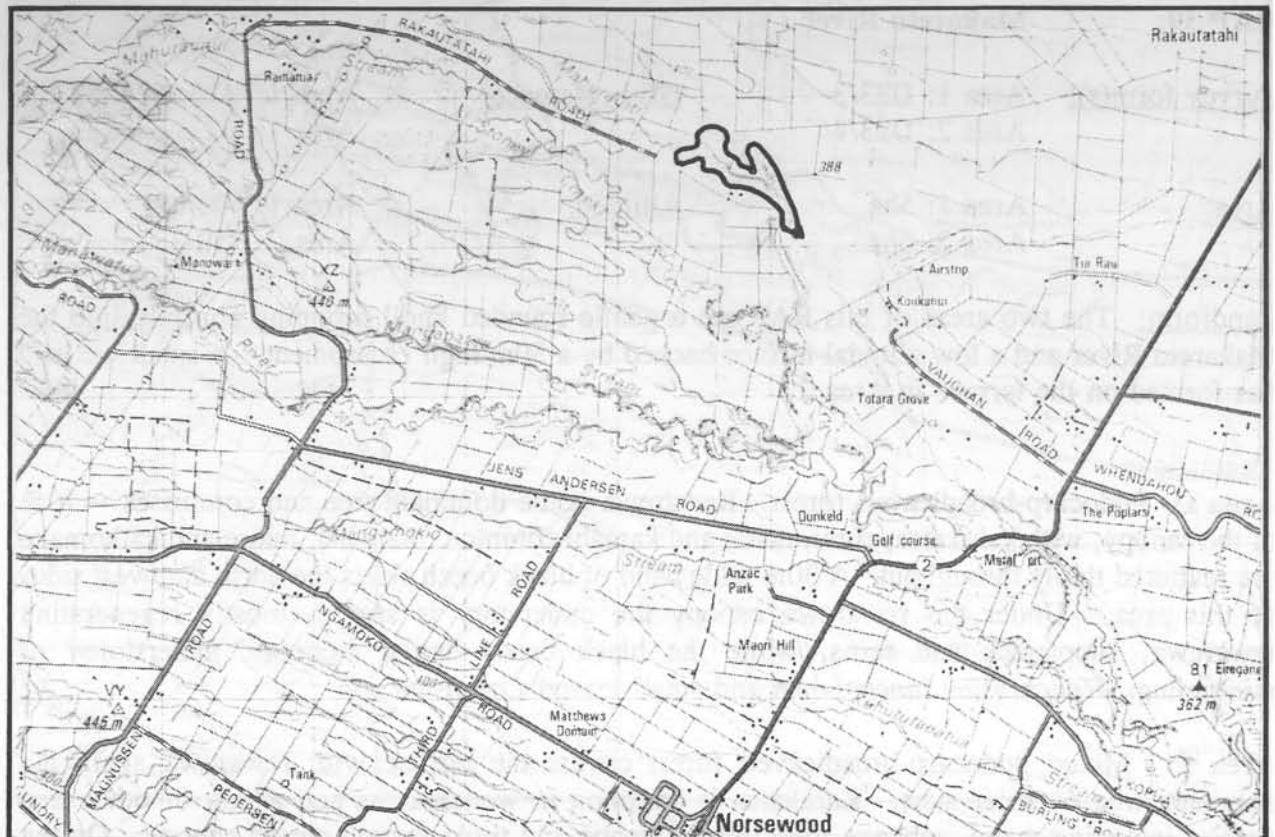
- Stock are affecting the understory regeneration of both areas.
- The Makaretu River occasionally overflows onto the lower end of the terrace in Area 2.
- The wetland area could easily be drained, though there is no reason to do so.

Selection criteria:

Representativeness	H	Viability	H
Diversity	H	Size and shape	L
Special features	M-H	Buffering	M
Naturalness	H	Fragility and Threat	L

Significance: H

Chosen as representative of broadleaved forest on alluvial terraces and escarpments, this small RAP has a diverse mix of species and contains the only significant area of rewarewa forest found during the survey. The small wetland adds considerably to the character of this RAP.



RAP 40: Mahurauti

Survey form(s): U23/1

Grid reference: U23, 847257

Area: 19 ha

Altitude: 380m

Landform: Surrounded by flat to rolling country, this RAP is located in a small entrenched stream gully. The Mahurauti Stream is small and has a stable shingle base.

Vegetation: Black beech is the dominant tree of this RAP, though a few totara are found around the edges of the gully and make up about 10% of the canopy. Scattered throughout are some kahikatea, matai and rimu, though these trees constitute < 5% of the canopy trees. In the gully bottom mahoe, marbleleaf, fuchsia and tree ferns are common. The understory of this RAP ranges from moderate to dense and on the drier slopes comprises mostly mingimingi, *Helichrysum lanceolatum* and *Coprosma spp*, while in the damper gully bottoms is a more diverse understory of small trees, shrubs and ferns.

Fauna: Possums are present in fairly low numbers but stock do not have access to this RAP. Common bush birds are present, though probably nothing unusual or rare is found here. Eels and small trout were seen in the stream, along with koura and bullies (species unknown).

Cultural: No archaeological sites are recorded.

Modifiers/Threats:

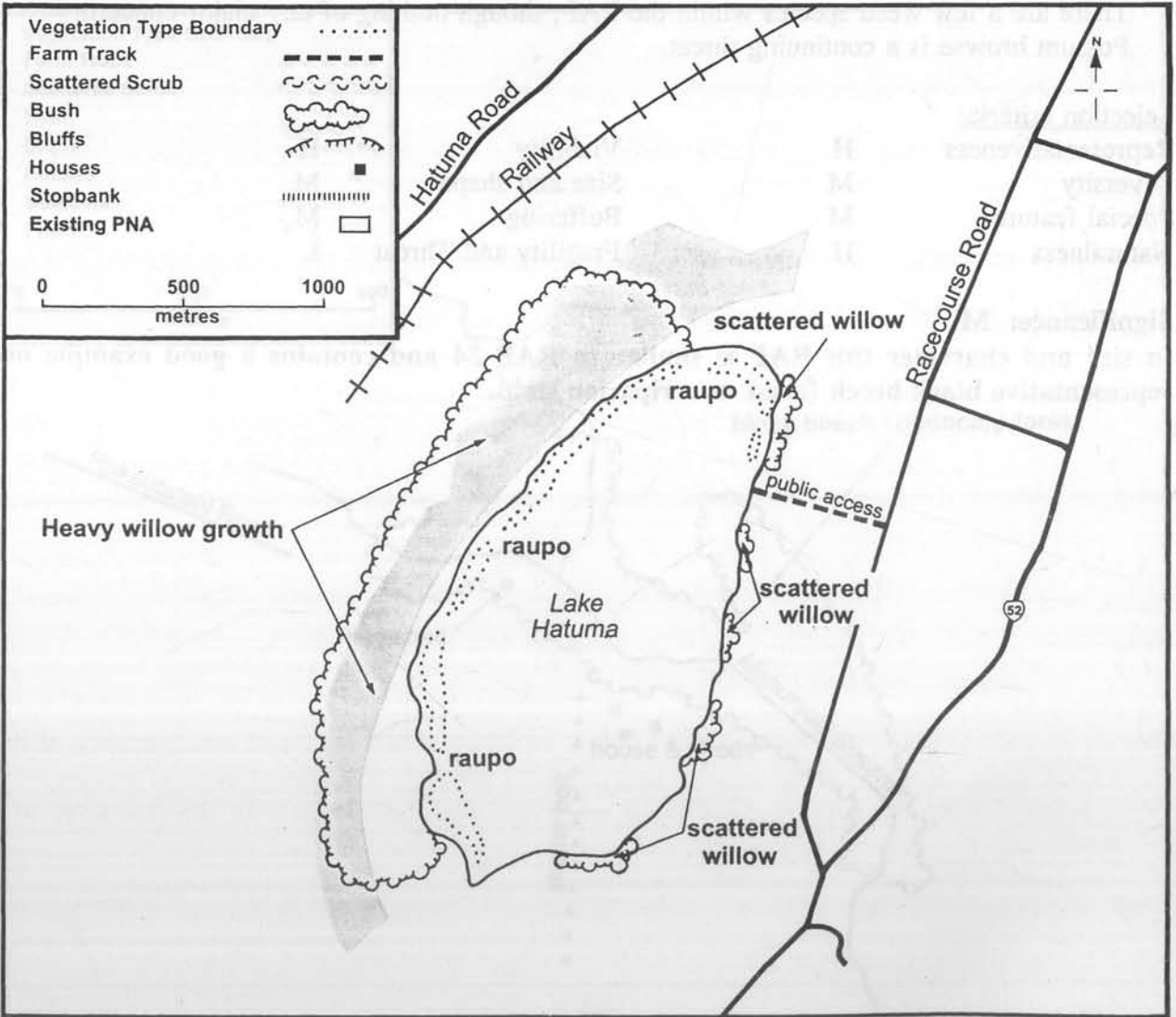
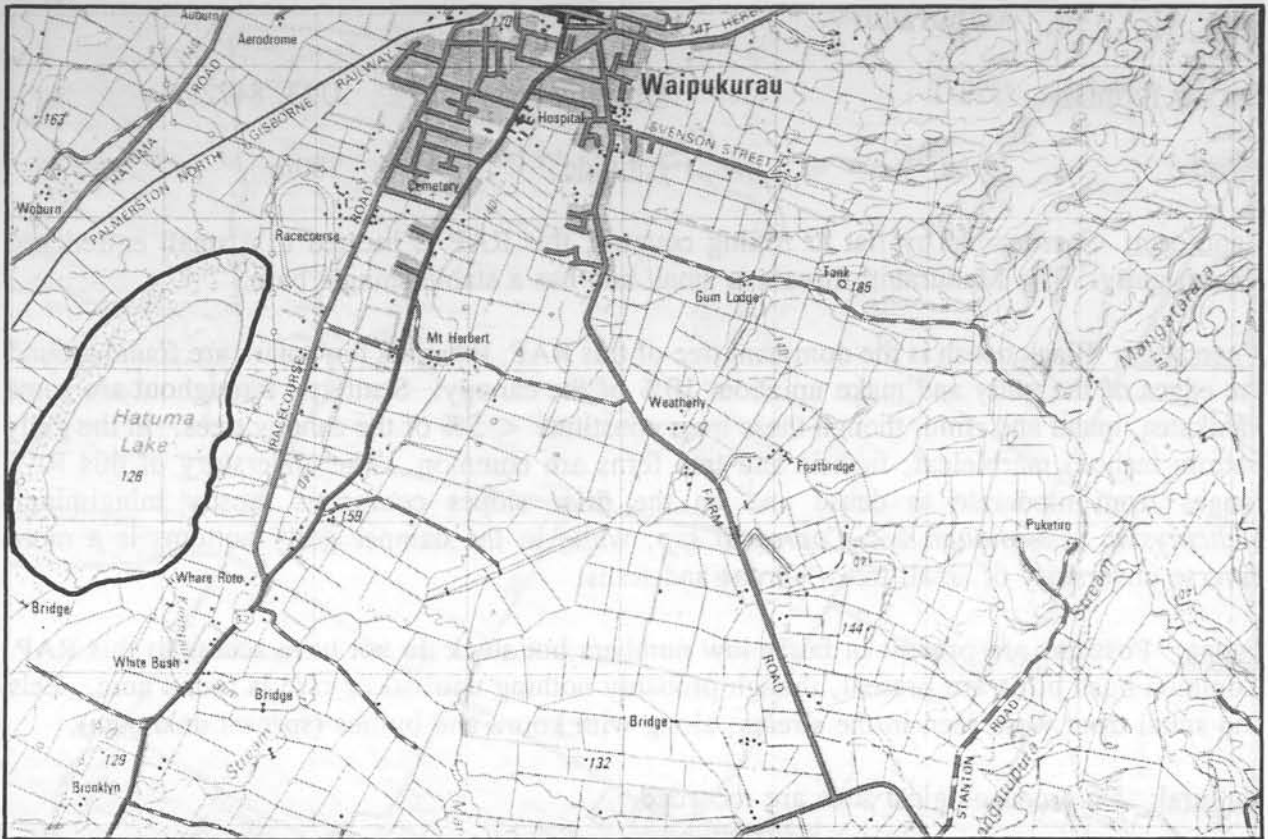
- There are a few weed species within the RAP, though nothing of any major concern.
- Possum browse is a continuing threat.

Selection criteria:

Representativeness	H	Viability	H
Diversity	M	Size and shape	M
Special features	M	Buffering	M
Naturalness	H	Fragility and Threat	L

Significance: M

In size and character this RAP is similar to RAP 24 and contains a good example of representative black beech forest as a riparian strip.



RAP 41: Lake Hatuma

Survey form(s): V23/1 Grid reference: V23, 110255

Area: 110 ha Altitude: 126m

Landform: Lake Hatuma is a shallow lake approximately 2km by 1km lying in a shallow basin. This lake suffers from low inflows and evaporation in summer and periods of flooding in winter.

Vegetation: On the western shore a forest of mature crack willow dominates with an almost continuous band of raupo to the east at the edge of the open water. Areas of pussy willow grow at the northern end and are increasing in area slowly. The eastern shoreline and southern end support communities of sedgeland and reedland, with low-lying grazed areas having a wide margin of willow weed and semi-aquatic herbs. The threatened plant *Urtica linearifolia* (narrow-leaved nettle) occurs on the western shore of this lake.

Fauna: Stock graze to the water's edge around the eastern shoreline. Its shallow nature makes this lake an important habitat for many species of waterfowl and waders, and high numbers of these birds use the lake as a feeding, nesting and moulting area. Dabchick are known to breed here, and bittern and spotless crake are recorded. Caspian tern also use the lake as a food source. Shortfinned eels are commercially fished and other fish species recorded are longfinned eel, goldfish, common bully, rainbow trout (uncommon) and kakahi. Lake Hatuma has a ranking of high in the SSWI inventory and regional in WERI.

Cultural: No archaeological sites are recorded but much use was made of this lake for food gathering by Maori.

Modifiers/Threats:

- Seasonal variations in the lake level are caused by winter flooding and summer drought.
- There are proposals for dredging the lake to enhance recreational opportunities.
- Grazing of the eastern shoreline has greatly modified wetland vegetation.
- Areas of pussy willow are gradually spreading.

Selection criteria:

Representativeness	H	Viability	H
Diversity	H	Size and shape	H
Special features	H	Buffering	M
Naturalness	M	Fragility and Threat	M

Significance: H

One of the Heretaunga ecological district's outstanding wetlands, Lake Hatuma supports high waterfowl and wader populations and is home to several threatened species. A conflict of management interests gives high priority to the protection of this area.



RAP 42: Tukituki/Waipawa Riverbed

Survey form(s): U22/37

Grid reference:

U22, 898420
U22, 935483 to
V21, 475702

Area: ~ 22500 ha

Altitude:

0-300m

Landform: Emerging from the Ruahine ranges, these rivers cross the Ruataniwha Plains to join near Waipawa before flowing north through low hill country and entering the sea at Haumoana. The majority of the riverbed is comprised of fine to medium gravels and sands and is generally 100-200m wide. In places short braided sections occur but over most of its length the river is confined to one channel.

Vegetation: The sections above State Highway 50 are fringed by some native vegetation, mostly second growth species, but for most of its length willows, poplars and other exotics are the dominant riverside trees. Above State Highway 2 lupins are abundant but they become less common further downstream, giving way to areas of open shingle and on more stable sites a cover of exotic annual weeds. From the Tukituki/Waipawa river confluence down to the sea stock are commonly grazed on the riverbanks and often wander freely onto the riverbed. Various weed species are spread through the RAP, the most significant being *C. vitalba*, buddleja and gorse.

Fauna: Possums, hares and rabbits are present throughout and stock graze the riverbanks and bed to varying degrees. The open riverbed provides valuable habitat for many species of riverbed birds including banded and black-fronted dotterel, pied stilt, black-billed gull and spur-winged plover. Other birds that commonly use the riverbed are white-faced heron, black-backed gull, pipit, shags and various species of waterfowl. Trout (both rainbow and brown), long and shortfinned eel, inanga, torrentfish and common, Cran's, bluegilled and redfinned bullies are all recorded from these rivers. The SSWI rating for these rivers is high.

Modifiers/Threats:

- Encroachment of perennial weeds onto the riverbed may be threatening the habitat of riverbed birds.
- Flooding is common and is necessary to maintain the open shingle beds required by riverbed birds.
- Shingle extraction and flood control work may cause disturbance to birds when carried out during the nesting season.
- Public use of the riverbed for a variety of reasons may disturb nesting birds.
- Domestic stock and feral browsers inhibit the growth of native riparian vegetation.

Selection criteria:

Representativeness	H	Viability	H
Diversity	M	Size and shape	H
Special features	H	Buffering	M
Naturalness	L	Fragility and Threat	M

Significance: H

Although much of this RAP is just outside the Heretaunga ecological district it has been included within this district for the purpose of this survey. The significance of this RAP lies in its valuable riverbed habitat supporting high numbers of waders and wetland birds.

ACKNOWLEDGEMENTS

During the field section of this survey the majority of landowners were helpful and many offers of information, assistance and refreshments were gratefully accepted. My thanks go to those people for their co-operation and interest.

My thanks to Ron Dick and Dave Cullen of the Hawkes Bay Regional Council who helped with initial identification of areas in the south of the district. Their knowledge of land ownership and farm boundaries saved many hours of work.

Elizabeth Pishief and Tony Batley of the New Zealand Archaeological Association contributed information on archaeological sites in the district, my thanks for this information.

Many staff within the Department of Conservation contributed to the field survey. Thanks go to Charlie Janes (pilot) and Ken Hunt (navigator) for their part in the aerial reconnaissance of the northern part of the district. Hans Rook's offer of assistance in the survey of wetland areas was invaluable and his enthusiasm in answering my many questions was appreciated.

The staff at Ongaonga Field Centre supplied accommodation, advice and assistance concerning the southern half of the district. Thanks go to Pat Bonis, Peter Dandy, Ben Aranyos and Bill Yeoman.

Typing and retyping of the text was skilfully and patiently completed by Jeanette Fifield. John McGreevy of Napier helped with mapping of RAPs on completion of the field work. Many thanks to both of these people.

Thanks also to the Department of Conservation draughting section, Wanganui, for the mapping of RAPs and to Pam Bain of the East Coast Conservancy for help with historic data.

Last but not least the supervision and assistance of John Adams and Geoff Walls is gratefully acknowledged. My thanks go to them for advice, help with plant identification, proofing and editing of the script. Geoff Walls wrote the description for RAP 15 and contributed to several other RAP descriptions. Also, my thanks to John for allowing time out to recharge my batteries during the long weeks of report drafting. Those few days chasing goats, listening for kiwis and scratching for snails did wonders in restoring enthusiasm to someone more use to grasping a slasher than a pen - thanks!

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APPENDIX 1

List of Completed Survey Forms for the Heretaunga Ecological District

Areas selected as RAPs have their RAP numbers listed in the right hand column.

Survey Form Number	Name of Area	Grid Reference	RAP Number
NZMS 260, Sheet V20			
V20/1	Pakuratahi/Te Ngaru Stream	472988	
V20/2	Esk River Mouth	445935	
V20/3	Eland No 1	356018	RAP 1
V20/4	Eland No 2	343010	RAP 1
V20/5	Munro Stream	345942	
V20/6	Lindsay Ponds	360935	
V20/7	Eland Lake	338020	
V20/8	Mangahina Stream No 1	252966	RAP 3
V20/9	Mangahina Stream No 2	280967	RAP 4
V20/10	Peninsula Stream/Mangaone River	292983	RAP 2
V20/11	Waiiti Stream	225935	RAP 5
V20/12	Whirinaki Lagoons	461975	RAP 6
NZMS 260, Sheet V21			
V21/1	Waitangi Estuary	474745	RAP 10
V21/2	Tukituki Estuary	485712	RAP 14
V21/3	McNeil	279886	
V21/4	Waiwhenua	170893	
V21/5	Rawhenua Gorge	165877	
V21/6	Okawa Stream	192802	RAP 7
V21/8	Mangatahi Ponds	115697	
V21/9	Oingo Lake	322755	RAP 9
V21/10	Runanga Lake	285735	RAP 8
V21/11	Ngaruroro Riverbed	190700	RAP 12
V21/12	Hurimoana Lake	296766	
V21/13	Te Rotokare	362755	
NZMS 260, Sheet V22			
V22/1	Pekapeka Swamp	323573	RAP 18
V22/2	Te Rotookiwa	433475	
V22/3	Haronga Road	236514	RAP 22
V22/4	Puketoi	236536	

Survey Form Number	Name of Area	Grid Reference	RAP Number
NZMS 260, Sheet V22			
V22/5	Raukawa 6A	220522	
V22/6	Barkers	250445	
V22/7	Highfield	195467	RAP 30
V22/8	Mahana	195467	RAP 30
V22/9	Pakihirua Stream	185540	
V22/10	Whakapirau	192592	
V22/11	Lake Poukawa	270515	RAP 23
V22/12	Butlers	140420	
V22/13	Hobsons	151415	
V22/14	Tukituki/Waipawa Riverbed	290430	RAP 42
NZMS 260, Sheet U21			
U21/1	The Pigsty	0847763	RAP 11
U21/2	Mangatahi Stream	065765	
U21/3	Gwavas Forest No 1	015636	RAP 17
U21/4	Ohara No 1	047735	
U21/5	Ohara No 2	041731	RAP 13
U21/6	Poporangi No 1	998628	RAP 17
U21/7	Poporangi No 2	019660	RAP 17
NZMS 260, Sheet U22			
U22/1	Glentui	091550	RAP 19
U22/2	Totara Hills	036542	
U22/3	Mangamauku Stream	00523	RAP 21
U22/4	Te Pah	025466	RAP 29
U22/5	Upokororo Stream No 1	025466	
U22/6	Upokororo Stream No 2	008549	
U22/7	Middle Upokororo	999548	
U22/8	Holdens Bush	015488	RAP 28
U22/9	Mangaoho Stream No 1	971519	RAP 26
U22/10	Mangaoho Stream No 2	945515	RAP 24
U22/11	Smedley Gullies	930504	
U22/12	Smedley Bluffs	925509	RAP 25
U22/13	Holdens No 2	975495	RAP 27
U22/14	The Steyning	985490	
U22/15	Evertree	968493	
U22/16	Evertree No 2	966493	
U22/17	Pattersons	956400	
U22/18	Bradleys	955404	

Survey Form Number	Name of Area	Grid Reference	RAP Number
NZMS 260, Sheet U22			
U22/19	Lamberts	955459	
U22/20	Lamberts No 2	945453	
U22/21	Condor	932451	RAP 31
U22/22	Barnsdale	922370	RAP 36
U22/23	Okareka	900335	
U22/24	Khyber Pass	913339	RAP 34
U22/25	Hardys	917403	
U22/26	Tukipo River	871365	
U22/27	Tangarewai	929326	
U22/28	Whittlewood	901350	
U22/29	Herricks	893329	RAP 37
U22/30	Mangatewai River	883305	RAP 38
U22/31	Eastern Equities	091401	RAP 35
U22/32	Turnbulls No 1	890439	
U22/33	Turnbulls No 2	900445	
U22/34	Worsnops	924443	RAP 32
U22/35	Gunsons	985426	RAP 33
U22/36	Puahanui Bush	075535	RAP 20
NZMS 260, Sheet U23			
U23/1	Mahurauiti Stream	847257	RAP 40
U23/2	Tui Rau	965247	
U23/3	Makaretu No 1	824282	RAP 39
U23/4	Makaretu No 2	838283	RAP 39
NZMS 260, Sheet V23			
V23/1	Lake Hatuma	110255	RAP 41
NZMS 260, Sheet W21			
W21/1	Clifton	535655	RAP 16
W21/2	Te Awanga	508676	RAP 15

Descriptions of surveyed areas not selected as RAPs

<u>Survey form:</u>	U21/2	Mangatahi Stream
<u>Grid Reference:</u>	U21, 065675	
<u>Area:</u>	150 ha	
<u>Altitude:</u>	220-300m	
<u>Landform:</u>	A deep and narrow stream gorge with occasional mudstone bluffs.	
<u>Vegetation:</u>	Mixed broadleaved forest with a height of 5-12m covers ~60% of this area, with a few small pockets of 4-5m tall manuka. A few small bracken fern fronds (<5%) and a few areas of grassy clearings. The understory in the lower gorge is almost nil, the upper gorge area has a moderate to dense understory of shrubs and ferns.	
<u>Comments:</u>	A lot of broom in places, particularly in the upper sections of the gorge. The lower gorge is grazed. Unlikely to be cut or grazed in the upper sections due to the steep terrain.	
<u>Survey form:</u>	U21/4	Ohara No.1
<u>Grid Reference:</u>	U21, 047735	
<u>Area:</u>	15 ha	
<u>Altitude:</u>	200-280m	
<u>Landform:</u>	A steep face above the Ohara Stream containing some steep, short gullies. Low alluvial terraces are located beside the Ohara Stream	
<u>Vegetation:</u>	Tall kanuka forest with scattered pockets of mixed broadleaved trees in the gullies. A sparse understory of small leaf <i>Coprosma</i> spp., <i>Helichrysum lanceolatum</i> and <i>Carmichaelia</i> spp, are found in the drier sites while the gullies contain rangiora, karamu, tree nettle and ferns. The flats beside the Ohara Stream have a moderate cover of gorse and broom. Grazed.	
<u>Comments:</u>	A representative area of kanuka-broadleaved forest, though nothing special.	
<u>Survey form:</u>	U22/2	Totara Hills
<u>Grid Reference:</u>	U22, 036542	
<u>Area:</u>	~ 25 ha	
<u>Altitude:</u>	300-380m	
<u>Landform:</u>	Rolling ridges and gullies with wide valley floors.	
<u>Vegetation:</u>	Scattered pockets of totara-titoki treeland with a few areas of closed canopy. Totara comprise ~80% of the canopy, titoki 10% and a mix of other broadleaved trees the remainder.	
	Almost no understory apart from a few bushes of tree nettle. This area is intensively grazed.	
<u>Comments:</u>	There has been some felling and limbing for firewood. A nice example of a totara treeland.	

Survey form: U22/5 Upokororo Stream No.1
Grid Reference: U22, 022546
Area: 15 ha
Altitude: 340-420m
Landform: Moderate to steep ridges and gullies dropping into the Upokororo Stream. Some small bluffs rise 20m out of the stream.
Vegetation: Open treelands and small pockets of totara forest are on the hill slopes. Two small gullies have been fenced for several years and these contain a dense understory of rangiora, hangehange, ferns, *Coprosma spp* etc. but over the remainder of the area the understory is almost absent. Scattered stands of kahikatea, matai and totara up to ~30cm DBH occur on small terraces alongside the stream.
Comments: The best parts of this area are already well fenced. Not a high priority for protection.

Survey form: U22/6 Upokororo Stream No.2
Grid Reference: U22, 008549
Area: 8.5 ha
Altitude: 360m
Landform: A moderately steep sided stream gully with a few small terraces.
Vegetation: Black beech-podocarp forest with a closed canopy of 20-25m tall. Beech and totara grow on the drier sites with kahikatea common on the stream terraces. Rimu and matai are scattered throughout. Moderate understory of small leaved *coprosma spp.*, mingimingi, regenerating trees and ferns. Only lightly grazed.
Comments: A small area of riparian vegetation with a healthy canopy. Would benefit from fencing and stock exclusion.

Survey form: U22/7 Middle Upokororo
Grid Reference: U22, 999548
Area: Area A: 10 ha Area B: 10 ha
Altitude: 360-440m
Landform: Moderately steep ridges and gullies. A small stream runs past the bottom of the block.
Vegetation: **Area A:** Totara dominant podocarp-broadleaved-beech forest with very little understory except on steep faces inaccessible to stock. The bush edge is not well defined in places. Grazed.
Area B: Podocarp-broadleaved forest with a variable height canopy (15-25m). Some large, emergent kahikatea, rimu and rewarewa. Other canopy trees include mahoe, titoki, marbleleaf and maire. There is a good subcanopy of small broadleaved trees and a moderately dense understory of *Coprosma spp.*, shrubs, supplejack and ferns. Some small stands of almost pure kahikatea up to ~30CM DBH grow on the stream terraces. Area B is not grazed.
Comments: Area A is nothing special.
 Area B is an example of mature podocarp-broadleaved forest of a similar quality to RAP 20 (Puahanui Bush) but the small size of the area detracts from its value.

Survey form: U22/11 Smedley Gullies
Grid Reference: U22, 930504
Area: 19 ha
Altitude: 380-480m
Landform: Short gullies and ridges dropping steeply toward the Makaroro River.
Vegetation: Ridges and faces of black beech with a few mixed podocarps and a sparse understory of small leaf *Coprosma spp.* and ferns. The damper and steeper gullies have a mix of broadleaved tree species including mahoe, rewarewa, hinau, lancewood and marbleleaf and a moderate understory of *Coprosma spp.*, hangehange, rangiora and ferns. Grazed lightly.
Comments: A small area with a broken canopy and areas of pasture grasses.

Survey form: U22/14 The Steyning
Grid Reference: U22, 985490
Area: 8 ha
Altitude: 360-400m
Landform: Easy hill country gullies and ridges.
Vegetation: Podocarp-broadleaved forest. Predominantly totara with other common broadleaved trees being titoki and rewarewa. A few kahikatea, hinau, tawa, mahoe and pigeonwood. A sparse understory of small-leaved *Coprosma spp.* and low ferns is present. Grazed.
Comments: An average block of totara dominant forest.

Survey form: U22/15 Evertree
Grid Reference: U22, 968493
Area: 10 ha
Altitude: 360-420m
Landform: Easy to rolling gullies and ridges surrounded by easy hill country.
Vegetation: Podocarp-broadleaved forest. The dominant canopy tree is totara and some large trees are present (up to 1.5m DBH and 30m tall). Other canopy trees include large rimu, matai and kahikatea. Titoki, rewarewa and mahoe are also common. Parts of this area have been logged in the recent past and small clearings of rank grass are scattered through the west side of the block. Stock have been excluded for ~4 years.
Comments: An average block of totara dominant forest.

Survey form: U22/16 Evertree No. 2
Grid Reference: U22, 966493
Area: 15 ha
Altitude: 350-420m
Landform: A steep sided stream gorge surrounded by moderate hill country and a high alluvial terrace.
Vegetation: Black beech forest with pockets of mixed broadleaved forest in the gully bottoms. A moderate to dense understory of mingimingi, mapou, rangiora and ferns is present.
Comments: A few goats are present. This area has soil and water conservation values.

Survey form: U22/17 Pattersons
Grid Reference: U22, 956400
Area: 7.5 ha
Altitude: 260-330m
Landform: Rolling to easy hill country gullies and ridges.
Vegetation: Totara dominates on the dry ridges with some matai, rimu and rewarewa. Broadleaved trees including titoki, mahoe, lemonwood and pigeonwood are more common in the gullies. Almost no understory is present apart from a few small areas of low ferns and occasional browsed *Coprosma spp.*
Comments: This area has been gifted to the Crown and has only recently been ring-fenced. Bats (species unknown) have been recorded from here.

Survey form: U22/18 Bradleys
Grid Reference: U22, 955404
Area: 5.3 ha
Altitude: 320m
Landform: An easy hill face and a shallow gully.
Vegetation: A totara dominant canopy with matai, kahikatea, titoki, rewarewa and mahoe also common. A few small rimu and two large totara are also present. Mahoe is the dominant understory plant, forming dense stands up to 2m tall in places. Good numbers of other tree seedlings are also present.
Comments: This area has a similar canopy to U22/17 (Pattersons) but has a far denser understory. This area has been fenced for ~4 years.

Survey form: U22/19 Lamberts
Grid Reference: U22, 955459
Area: 43 ha
Altitude: 320-380m
Landform: Three small stream gullies located in easy hill country.
Vegetation: A totara dominant canopy with scattered rimu, matai, kahikatea and rewarewa. The gully bottoms contain small pockets of mahoe and there are a few small pockets of kanuka around the gully edges. The understory is almost nil due to intensive grazing.
Comments: Long, narrow gullies with nothing really special. A low priority for protection.

Survey form: U22/20 Lamberts No. 2
Grid Reference: U22, 945453
Area: 60 ha
Altitude: 380-440m
Landform: Rolling to moderately steep gullies and ridges.
Vegetation: Predominantly a totara canopy with other common trees being kahikatea, matai, rewarewa, rimu and mahoe. 1/3 of this area is grazed and has a very sparse understory. The remainder has recently been partly logged and radiata pine has been planted in the gaps created by logging.
Comments: This area would have been of reasonable quality before the logging and replanting in pines.

Survey form: U22/23 Okareka
Grid Reference: U22, 900335
Area: 25 ha
Altitude: 300-350m
Landform: A small stream gully on rolling farmland. Deeply entrenched in the lower sections.
Vegetation: Black beech-mixed broadleaved forest, Black beech comprises ~25% of this area, second growth broadleaved species including lacebark, pate, mahoe, wineberry and rangiora cover most of the remainder. There are many areas of heavy vine growth, mainly pohuehue and *Clematis vitalba*. Himalayan honeysuckle and blackberry are widespread. The majority of the area is not grazed.
Comments: An area of generally scrappy vegetation with major weed problems.

Survey form: U22/25 Hardys
Grid Reference: U22, 921401/916403
Area: 10 ha
Altitude: 300-330m
Landform: **Area A:** A low alluvial terrace close to the Tukituki riverbed.
Area B: A steep escarpment ~30m high dropping partly onto a terrace and partly into the Tukituki riverbed. There is a small wetland at the base of this escarpment.
Vegetation: **Area A:** Podocarp forest. An even mix of matai, totara and kahikatea with only occasional rimu. Other canopy trees present are a few titoki, pokaka, black maire and miro (uncommon). The understory is almost nil due to grazing pressure.
Area B: Titoki-totara-rewarewa forest. These three trees are dominant and comprise ~80% of the canopy. A mix of podocarp and broadleaved trees make up the remainder and includes tawa, hinau, mahoe and kowhai.
Comments: The low terrace of Area A is gradually being eroded by the Tukituki River. Area A is a nice stand of smallish podocarps.

Survey form: U22/26 Tukipo River
Grid Reference: U22, 871365
Area: 28 ha
Altitude: 360-400m
Landform: **Area A:** Moderate to steep gullies and ridges alongside the Tukipo river.
Area B: A steep sided stream gorge.
Vegetation: **Area A:** Black beech forest and treeland with occasional rimu and kahikatea. Many areas of open grass. The understory is sparse to moderate and is dominated by mingimingi, *Helichrysum lanceolatum* and small-leaved *Coprosma spp.* Broom is abundant in places. Grazed.
Area B: Mainly second growth trees and shrubs including marbleleaf, kohuhu, manuka, mingimingi, karamu, tree tutu and koromiko. Scattered black beech pockets are present on the drier sites and ridges and there are a few grassy clearings in the stream bed. Broom, Himalayan honeysuckle and blackberry are abundant in places and some large pines are scattered throughout. Grazed in places.
Comments: Weed problems and the broken canopy detract from the value of both blocks.

Survey form: U22/27 Tangarewai
Grid Reference: U22, 929326
Area: 20 ha
Altitude: 240-280m
Landform: Stream gullies, steep to very steep sided, running into the Tangarewai Stream.
Vegetation: Totara dominant podocarp-broadleaved forest. 80% of the canopy trees are totara with a few matai, kowhai, kahikatea and black beech. The steeper gullies contain mahoe, karamu, rangiora and pate. Large pines are planted around the edges of most of the gullies and broom is abundant in some areas. The understory is generally sparse except on steeper areas inaccessible to stock.
Comments: *Clematis vitalba* is established at one site.

Survey form: U22/28 Whittlewood
Grid Reference: U22, 901350/897346
Area: 20 ha
Altitude: 320m
Landform: **Area A:** An old alluvial terrace dropping over a 20 metre escarpment to a swampy stream.
Area B: Undulating country dropping into a small stream.
Vegetation: **Area A:** Almost pure totara forest on the terrace, though a few other tree species are found on the escarpment. These include matai, kahikatea, mahoe and cabbage tree. The understory is almost nil due to grazing.
Area B: Totara dominant forest with a few rimu, kahikatea, matai and titoki nearer the stream. The understory is sparse, and comprises mainly small-leaved *Coprosma spp*, mingimingi and ferns. Grazed.
Comments: A good representative area of totara dominant forest which could be considered for protection.

Survey form: U22/32 Turnbolls No. 1
Grid Reference: U22, 890439
Area: 47 ha
Altitude: 340-420m
Landform: A steep sided entrenched stream gully.
Vegetation: Manuka shrubland and mixed broadleaved forest, with pockets of black beech. The broadleaved trees are predominantly second growth species such as lancewood, mahoe, lacebark and marbleleaf and have a canopy of 5-12m tall. The manuka canopy is generally 3-4m tall.
Comments: Goats present in low numbers. No outstanding features.

Survey form: U22/33 Turnbolls No. 2
Grid Reference: U22, 900455
Area: 23 ha
Altitude: 320-400m
Landform: A deeply entrenched gully surrounding by easy to steep hill country.

Vegetation: Black beech forest and manuka shrubland. Black beech forest comprises ~60% of this area. It has a generally closed canopy and a moderately dense understory dominated by *Coprosma spp*, mingimingi, heketara and lancewood. The remaining 40% is 4-5m tall manuka with a few small areas of bracken fern and grass. The understory here is moderate to dense and is dominated by mingimingi and ferns.

Comments: A few goats are present. This area is ring-fenced and has not been stocked for several years.

Survey form: U23/2 Tui Rau

Grid Reference: U23, 865247

Area: 7 ha

Altitude: 360m

Landform: Flat plains of deep alluvial gravels.

Vegetation: Totara-dominant podocarp-broadleaved forest. Totara comprises ~50% of the canopy with matai, kahikatea and tawa common. Other canopy trees present are black maire, pokaka, cabbage tree and titoki. There is almost no understory due to past grazing.

Comments: This area has recently been ring-fenced and destocked, though a narrow stock lane cuts through the centre of the area.

Survey form: V20/1 Pakuratahi/Te Ngaru Stream

Grid Reference: V20, 472988

Area: 11 ha

Altitude: 0-3m

Landform: A small mud and shingle bottomed estuary and shallow lagoon behind a pebble beach, surrounded by low lying flood prone land.

Vegetation: Much modified estuarine vegetation comprising a disjoint fringe of *Carex*, *Juncus* and raupo, with pockets of crack willow and blackberry amongst areas of long grass.

Comments: Bittern, fernbird and crake are recorded. This area has been greatly modified and has high public use.

Survey form: V20/2 Esk river mouth

Grid Reference: V20, 445935

Area: 12 ha

Altitude: 0-3m

Landform: This is another small estuary similar in character to V20/1.

Vegetation: As with V20/1 the vegetation is highly modified and comprises predominantly exotic trees, blackberry, rank pasture grasses and annual weeds.

Comments: Intensive horticulture and small farming are the predominant surrounding land uses. This area has high public use and relatively low natural values.

Survey form: V20/5 Munro Stream
Grid Reference: V20, 345942
Area: 49 ha
Altitude: 80-220m
Landform: A steep sided stream gully of mudstone containing narrow gorges and areas of unstable mudstone bluffs.
Vegetation: Kanuka 10-15m tall with ~5% manuka and scattered broadleaved trees including titoki, kowhai, mahoe and cabbage trees. A sparse understory of kawakawa, *Helichrysum lanceolatum* and ferns. Grazed.
Comments: Some radiata pine in one area. A nice stand of tall kanuka but modified by stock and some scrub cutting.

Survey form: V20/6 Lindsay Ponds
Grid Reference: V20, 360935
Area: 18 ha
Altitude: 150-170m
Landform: Four small lakes surrounded by easy hill country and separated by low saddles.
Vegetation: All the lakes are surrounded by pastureland and fringed to varying degrees by raupo, *Carex* and *Juncus* spp. Small pockets of willow and blackberry are dotted about the lakes and a few isolated trees of kanuka are present.
Comments: Used by many species of waterfowl as feeding, resting and moulting areas. The WERI rating is moderate. Multiple owners.

Survey form: V20/7 Eland Lake
Grid Reference: V20, 338020
Area: 6 ha
Altitude: 258m
Landform: A small deepwater lake surrounded by steep hill country, probably formed by a large land slump.
Vegetation: A narrow fringe of tall kanuka skirts the south side of the lake and some native trees and planted exotics are present at the western end. 50% of the lake edge is in pasture, the remainder is a disjointed fringe of *Carex* and *Scirpus* spp. The class B aquatic noxious plant hydrilla occurs in the lake.
Comments: Habitat for common waterfowl, though numbers have declined since the introduction of grass carp for the control of hydrilla. Grazed to the waters edge.

Survey form: V21/3 McNeil
Grid References: V21, 279886
Area: 6 ha
Altitude: 180-300m
Landform: A small gully on the eastern slopes of Mt McNeil.
Vegetation: A canopy of predominantly kanuka of 6-10m tall and scattered pockets of 3-4m tall manuka (<5%). Occasional broadleaved trees including ngaio, mahoe, karamu and titoki are scattered throughout (<10%). Understory is generally poor or absent. Grazed.

Comments: This small patch of average scrub has some potential if fenced and destocked but would have a low priority for protection.

Survey form: V21/4 Waiwhenua

Grid References: V21, 170893

Area: 50 ha

Altitude: 140-220m

Landform: A steep stream gorge with areas of bluffs and a few steep grassy slips.

Vegetation: Tall kanuka comprises ~70% of this area with pockets of kowhai, titoki, mapou, kohuhu, fuchsia and mahoe along the stream sides. The upper slopes have an open understory of mostly *Helichrysum lanceolatum* while the lower slopes support a more diverse community of small trees, shrubs and ferns.

Comments: A kanuka gorge typical of the northwest regions of this ecological district.

Survey form: V21/5 Rawhenua

Grid Reference: V21, 165877

Area: 60 ha

Altitude: 140-260m

Landform: A steep sided stream gorge with some bluffs.

Vegetation: Tall kanuka (70%) with scattered kowhai, mahoe, karo and karamu throughout (<10%). Remainder is grassy clearings and slips. An understory of *Helichrysum lanceolatum*, rangiora and ferns is present and varies in density from open on the higher sites to moderately dense in the stream and gullies.

Comments: Typical kanuka forest of this area, this block has a more patchy canopy and more pressure from animals than V21/4.

Survey form: V21/7 Waikonini Stream

Grid Reference: V21, 140849

Area: 45 ha

Altitude: 180-220m

Landform: A stream gully with steep sides and several mudstone bluffs. There are several small, poorly drained terraces beside the stream.

Vegetation: Tall kanuka forest with kowhai, lacebark and cabbage trees scattered throughout. Extensive areas of low blackberry occur under the canopy but otherwise the understory is very sparse. Areas of *Carex sp* cover many of the low terraces. Grazed.

Comments: Not an inspiring area. Many open areas, much blackberry and very little understory.

Survey form: V21/8 Mangatahi Ponds

Grid Reference: V21, 115697

Area: 8 ha

Altitude: 180m

Landform: Three small ponds located beside the Mangatahi stream on a series of stream terraces. Steep mudstone escarpments are a feature of the surrounding land.

Vegetation: All ponds are fringed to a greater or lesser extent by raupo, *Carex sp.* and flax, and one has a number of tortured willows planted along one side. About 1-2ha of surrounding farmland is swampy and has a cover of 20% raupo and 80% *Carex sp.*

Comments: All ponds are used for shooting. The dam wall has been raised on 2 ponds. Only of moderate value to wildlife and not worth special protection effort.

Survey form: V21/12 Hurimoana Lake
Grid Reference: V21, 296766
Area: 31 ha
Altitude: 30m
Landform: A shallow water lake surrounded by rolling hill country.
Vegetation: An almost continuous narrow fringe of *Juncus sp* with occasional patches of raupo around the edges and in the lake itself. Mature crack and pussy willow constitutes ~ 10% of the area and forms small islands in the lake. Pasture is grazed to the lake edge.

Comments: This lake is subject to extreme variations in water level and dries out completely every few years. Bittern recorded. Rated "local" in WERI.

Survey form: V21/13 Te Rotokare
Grid Reference: V21, 362755
Area: 14 ha
Altitude: 25m
Landform: A shallow water lake surrounded by easy hill country.
Vegetation: Predominantly grazed pasture to the waters edge with only occasional scattered *Juncus sp* around the edges ~ 20% of the lake area is taken up by tall raupo and a few scattered willows grow around the shoreline.

Comments: Bittern, dabchick, Scaup, Australian coot and a range of other waterfowl and waders use this lake. Has a history of drainage and modification, and water levels are variable. The WERI rating is "local".

Survey form: V22/2 Te Rotookiwa
Grid Reference: V22, 233475
Area: 15 ha
Altitude: 80m
Landform: Two shallow water lakes roughly equal in size, located in rolling hill country. A railway embankment passes between the two lakes.
Vegetation: A discontinuous fringe of raupo and *Juncus sp* surrounds ~ 60% of the shore while the remainder is grazed pasture. Willows grow along the railway embankment and are found scattered around the lake.

Comments: Supports a range of waterfowl species including dabchick. Variable water levels. Has "regional" significance in WERI.

Survey form: V22/4 Puketoi
Grid Reference: V22, 236536
Area: 19 ha
Altitude: 200-300m
Landform: Easy to moderately steep hill country on the flanks and top of the Raukawa Range.
Vegetation: Areas of titoki forest and treeland and a face of totara-mixed broadleaved forest. Broadleaved trees include mahoe, kohuhu, cabbage trees, lacebark and tawa. A few large totara up to ~1.25M DBH are present. There is a sparse understory of tree nettle and kawakawa. Grazed.
Comments: This area has been highly modified by stock but has potential if fenced and destocked. Multiple owners.

Survey form: V22/5 Raukawa 6A
Grid Reference: V22, 220522
Area: ~12 ha
Altitude: 200-300m
Landform: Faces and gullies on the mid to lower slopes of the Raukawa range. There are a few limestone outcrops and boulders in the higher parts of this area.
Vegetation: Titoki dominant treeland in small pockets spread over a wide area. Titoki comprises ~70% of the canopy, other common trees are kaikomako, pigeonwood, mahoe, marbleleaf, ngaio and cabbage trees. A few medium size matai and kahikatea are scattered throughout. The understory is almost nil, in places a few bushes of tree nettle but otherwise pasture grass and thistles. Grazed intensively.
Comments: There is some obvious wind damage to the canopy, particularly around the edges. Similar in character to RAP 22 (Haronga Road). A dying remnant.

Survey form: V22/6 Barkers
Grid Reference: V22, 250445
Area: 8 ha
Altitude: 100m
Landform: Two shallow gullies and a gentle ridge on rolling country.
Vegetation: Titoki dominant treeland with a mix of other broadleaved tree species including tawa, karaka, rewarewa, mahoe and kaikomako. Occasional matai and kahikatea up to ~20m tall. The canopy trees are widely scattered in places and no understory exists. Intensively grazed.
Comments: Some wind damage to the canopy. This small isolated remnant is in decline and has no future unless fenced. Low priority for covenanting but it would be fairly easy to protect this area physically.

Survey form: V22/8 Mahana
Grid Reference: V22, 200531
Area: 22 ha
Altitude: 180-300m
Landform: Easy to moderately steep faces and gullies. A terrace ~150m wide is located near the centre of the area.

- Vegetation: Titoki-dominant broadleaved forest with a few scattered podocarps. There are several areas of closed canopy but more commonly it is patchy with the bush edges not well defined. Moderate understory of tree nettle, ferns and occasional thickets of supplejack. Grazed. One large nikau palm was seen.
- Comments: This area was almost selected as a RAP. The largest and most intact area of forest in the Anaroa Valley. It is in need of fencing and destocking to allow regeneration.
-
- Survey form: V22/9 Pakihirua
Grid Reference: V22, 185540
Area: 10 ha
Altitude: 200-260m
Landform: A face and gully of moderate to steep slopes on the true left side of the Pakihirua Stream. Some small limestone outcrops.
Vegetation: 2/3 podocarp-mixed broadleaved forest with totara dominant and a mix of other trees including titoki, mahoe, matai, lancewood, lacebark and kowhai. About 1/3 of the area is totara-titoki-kahikatea treeland. Much of this area has been closed to stock and they have only recently gained access. The understory is moderate and comprises mostly tree nettle, kawakawa and ferns.
Comments: If this area was larger it would have been a RAP. There is a good dense canopy over 2/3 of this area.
-
- Survey form: V22/10 Whakapirau
Grid Reference: V22, 192592
Area: 18 ha
Altitude: 240m
Landform: Rolling gullies and ridges on easy country.
Vegetation: Predominantly titoki (80%) with scattered emergent matai up to ~1.2m DBH and a few large emergent rewarewa. Other canopy trees include pigeonwood, marbleleaf, totara, mahoe and kowhai. Tree nettle covers about 20% of the ground area, otherwise only a few small, browsed mahoe and ferns are present as an understory. One massive old totara with an estimated DBH of 2.5-3m was seen.
Comments: A reasonably good quality block of titoki dominant forests in need of fencing and destocking. Worth consideration for covenanting if an approach is made by the landowner.
-
- Survey form: V22/11 Butlers
Grid Reference: V22, 140420
Area: 5.8 ha
Altitude: 260m
Landform: Rolling gullies and ridges on easy hill country.
Vegetation: A treeland of titoki (80%) with lemonwood, totara, rewarewa, pigeonwood, ngaio and tawa. A few small matai and one kowhai (*Sophora microphylla*) were seen. The understory is nil due to intensive grazing.
Comments: Some wind damage to exposed edges. A small and highly modified block.

Survey form: V22/13 Hobsons
Grid Reference: V22,
Area: 12 ha
Altitude: 180-200m
Landform: Rolling gullies and ridges dropping to a broad valley floor.
Vegetation: Titoki (80%) with other broadleaved trees including mahoe, pigeonwood, tawa, rewarewa and kaikomako scattered throughout. A closed canopy covers ~50% of the area the remainder is scattered trees. Only a sparse understory of low ferns, vines and small leaf *Coprosma spp.* Grazed.
Comments: Similar in character to V22/12 but with a slightly better understory.

APPENDIX 3

LIST OF EXISTING PROTECTED NATURAL AREAS IN HERETAUNGA ECOLOGICAL DISTRICT***

Land managed by the Department of Conservation

For more information see the Conservation Management Strategy, Volume II, Hawke's Bay Conservancy.

CMS No.	Name	Area (ha)	NZMS 260 Grid Reference	Natural Features	Comments
80036 (1)	Ngaruroro CA	4.93	U21, 098755	Alluvial flats close to the Ngaruroro riverbed, tall kanuka and rank grass cover much of this area. Abundant gorse and some blackberry.	Unfenced, access difficult.
80171 (2)	Poporangi Stream CA	25.8	U21, 020670	Remnant podocarp-broadleaved-beech forest. Shingle streambed of the Poporangi Stream. Common bush birds.	A riparian strip - includes some of RAP 17.
80037 (3)	A'deanes Bush SR	38.44	U22, 920365	Alluvial terraces with small, wet hollows. Tall podocarp-broadleaved-blackbeech forest. Large totara present. Long-tailed bats present.	An excellent example of lowland forest. Moderate public use

*** Lands managed by the Department of Conservation without significant natural values are not listed.

Bracketed () numbers in column one are cross referenced to Table 1.

SR = Scenic Reserve, HR = Historic Reserve, CA = Conservation Area, RR = Recreation Reserve. MS = Marginal Strain

CMS No.	Name	Area (ha)	NZMS 260 Grid Reference	Natural Features	Comments
80038 (4)	Moncktons SR	16.44	U22, 905325	Alluvial terrace and hill slopes. Podocarp-broadleaved forest with occasional black beech. Common bush birds.	High public use, moderate weed problems including <i>C.vitalba</i> and pines.
80039 (5)	Springhill SR	5.05	U22, 964441	Small stream terraces and gentle hill slopes. Totara dominant podocarp-broadleaved forest.	Low public use, access across private land.
80040 (6)	Inglis Bush SR	20.6	U22, 950367	Situated on an alluvial terrace of the Tukituki River. Contains a small wetland. Tall podocarp forest. Supports a shrubland of <i>Olearia virgata</i> uncommon in Hawke's Bay. Long-tailed bat.	Low public use. An excellent example of lowland podocarp forest.
80096 (7)	Mangatewai SR	79.2	U22, 860308 U23, 915295	River terraces and hill slopes of the Mangatewai River. Podocarp-broadleaved-black beech forest. Common bush birds.	Low public use. Modified by grazing. Only partly fenced.
80173 (8)	Mangatewai River MS	7.03	U22, 880303 U22, 890300	Very steep sided riparian strip. A podocarp-broadleaved-beech forest and treeland. Common bush birds.	Low public use.

Bracketed () numbers in column one are cross referenced to Table 1.

SR = Scenic Reserve, HR = Historic Reserve, CA = Conservation Area, RR = Recreation Reserve, MS = Marginal Strip

CMS No.	Name	Area (ha)	NZMS 260 Grid Reference	Natural Features	Comments
80130 (9)	Tukituki River SR	9.83	V23, 101297	A remnant stand of tall podocarp-broadleaved forest dominated by kahikatea and matai. Located on alluvial terraces of the Tukituki River.	Moderate public use, close to Waipukurau. Controlled and managed by the CHB District Council.
80134 (10)	Hatuma CA	100.2	V23, 110255	An area of flat land on the western side of Lake Hatuma. Willows, raupo, sedge and reedland. Very significant wildlife habitat. The locally threatened plant <i>Urtica linearifolia</i> occurs here.	High public use (boating, shooting). Important culturally to Maori. Includes part of RAP 41.
80016 (11)	Ahuriri Estuary CA	392	V21, 393864 V21, 429848 V21, 430880 V21, 438834	A large estuary close to Napier. Uplifted by the 1931 Napier earthquake. Vegetation dominated by rush and sedgeland, saltmarsh, raupo and rank grasses. Extremely important wildlife habitat for fish and birds.	High public use in parts. Important culturally to Maori.
80101 (12)	Heipipi Pa HR	24.5	V20, 426916	Moderate to steep hill country, surrounded by private farmland and exotic plantation. Grazed pasture, some manuka and some blackberry.	An important Pa site with a 500 year history of occupation. Pits, middens and ditches are visible. Low - moderate public use.

Bracketed () numbers in column one are cross referenced to Table 1.

SR = Scenic Reserve, HR = Historic Reserve, CA = Conservation Area, RR = Recreation Reserve, MS = Marginal Strip

CMS No.	Name	Area (ha)	NZMS 260 Grid Reference	Natural Features	Comments
80043 (13)	Westshore Domain RR	50.2	V21, 438852	An estuarine wetland, close to the Ahuriri Estuary. Rushlands, saltmarsh and grasslands with a few planted native and ornamental trees. Raised during the 1931 Napier earthquake. Important waterfowl habitat.	High public use. Managed by the Napier City Council.
80089 (14)	Otataru Pa HR	33.3	V21, 390769	Rolling to steep hill country close to Taradale. Most of the reserve is grazed pasture but small areas are planted in native trees.	A nationally significant historic site. The largest Pa in Hawke's Bay with a long history of occupation. High public use.
80100 (15)	Upoko Block CA	18.6	V21, 472755	Shingle spit and beach front extending approximately 3km north of Ngaruroro River mouth. Sparsely vegetated with low growing coastal plants. Black-billed gulls and terns occasionally nest in this area.	Moderate-high public use by fishermen, picnickers etc.

Bracketed () numbers in column one are cross referenced to Table 1.

SR = Scenic Reserve, HR = Historic Reserve, CA = Conservation Area, RR = Recreation Reserve, MS = Marginal Strip

QEII Trust Open Space Covenants

This list may not be complete - for more information contact QEII National Trust

Area	Registration Date	Comments
15.9 ha	15.11.84	A forest remnant of podocarp-broadleaved forest in a stream gully.
275.6 ha	31.3.83	Predominantly totara treelands on undulating low hills.
10.2 ha	19.7.84	Native forest and exotic grasslands on a small hill overlooking the Waipawa River. Maori Pa site.
0.55 ha	15.12.92	A small forest remnant, geologically significant.
4.51 ha	26.11.92	Forest remnant and bluffs.

List of Sites in Heretaunga Ecological District
not Surveyed

Location Whanaukini Stream
Grid Ref U21, 050700
Area ~ 60 ha
Reason Not Surveyed Inspected briefly from the top of the gorge. Only scattered areas of broadleaved trees and a few small pockets of totara. Abundant broom and gorse. Not considered worth filling out a form.
Comments A long narrow gorge.

Location Lower Poporangi Stream
Grid Ref U21, 056740
Area ~ 80 ha
Reason Not Surveyed Inspected briefly. Scattered areas of broadleaved trees and small pockets of kanuka. Abundant gorse and broom. Not considered worth filling out a form.
Comments Steep faces and some river flats. Stream bed itself is wide and consists mostly of fine shingle.

Location Ends of Mill and Black Roads
Grid Ref U22, 842412 and 815325
Area ~ 100 ha
Reason Not Surveyed These two areas were thought to be more typical of the vegetation patterns of the Ruahine ecological district and are probably better included in that district.
Comments Faces and gullies of scrub.

Location Mangatewai Farm
Grid Ref U22, 925304
Area ~ 10 ha
Reason Not Surveyed Briefly inspected. Not considered worth a form due to the narrow width and abundant weeds, including *C.vitalba*, willows, Himalayan honeysuckle and various ornamental exotic trees.
Comments Totara dominant forest and treeland in a small, shallow stream gully.

Location Eskmount Station
Grid Ref V20, 330990
Area ~ 50 ha
Reason Not Surveyed Access refused, owner distrustful of government.
Comments A steep sided stream gorge of tall kanuka forest.

Location Apley Station
Grid Ref V21, 300872
Area ~45 ha
Reason Not Surveyed This area had been inspected previously by the author and was known to contain only scattered trees and to be heavily grazed.
Comments Riparian vegetation, mostly growing on steep stream sides.

Location Apley Station - Puketitiri Road Junction
Grid Ref V21, 332875
Area ~15 ha
Reason Not Surveyed Inspected briefly. Low kanuka-manuka, grazed hard and very sparse. Not considered worth filling in a form.
Comments Moderately steep farmland.

Location Lower Waiti Stream
Grid Ref V21, 272885
Area ~40 ha
Reason Not Surveyed This area has been partly sprayed with herbicide and underplanted with pines.
Comments Moderately steep hill country, remaining vegetation is tall kanuka treeland, grazed in places.

Location Mt Cameron Faces
Grid Ref V21, 242878
Area ~80 ha
Reason Not Surveyed This area is covered almost completely in tall gorse. There are a few small pockets of second growth forest.
Comments A DOC marginal strip runs along the back of this area adjacent to the Tutaekuri River.

Location Flag Range Road, Tutaekuri River Tributary
Grid Ref V21, 230847
Area ~25 ha
Reason Not Surveyed Landowner spoken to in person. "As much as possible" of the remaining kanuka is being cut. Owner not interested in protection.
Comments There is probably not much kanuka left in this gully.

Location Okawa Stream Tributaries
Grid Ref V21, 175797
Area ~30 ha
Reason Not Surveyed Briefly inspected. Disjoint and scrappy kanuka forest in a gully. Better examples elsewhere.
Comments Owner not interested in protection.

<u>Location</u>	Heads of Yarrow Stream
<u>Grid Ref</u>	V21, 110620
<u>Area</u>	~ 30 ha
<u>Reason Not Surveyed</u>	This area is about to be registered as a QEII open space covenant.
<u>Comments</u>	Many fingers of second growth bush in steep stream gullies. Owner spoken to on the phone only.

<u>Location</u>	East End of River Road
<u>Grid Ref</u>	V21, 200867
<u>Area</u>	~ 30 ha
<u>Reason Not Surveyed</u>	Owner not able to be contacted.
<u>Comments</u>	Probably tall kanuka forest and treeland. Located on a steep escarpment above the Waikonini Stream.

<u>Location</u>	2km Northwest of Fernhill
<u>Grid Ref</u>	V21, 306746
<u>Area</u>	~ 10 ha
<u>Reason Not Surveyed</u>	Owner not able to be contacted at time of survey.
<u>Comments</u>	A shallow water lake similar in size and character to Hurimoana Swamp.

<u>Location</u>	Neilsons Lakes ~2km southwest of Te Awanga
<u>Grid Ref</u>	V21, 500652
<u>Area</u>	~ 10 ha
<u>Reason Not Surveyed</u>	Owner unable to be contacted at time of survey.
<u>Comments</u>	Shallow water lakes surrounded by moderately steep hill country. Breeding area for black swan, dabchick and shag. Paradise duck moulting site. Has a WERI rating of regional.

HAWKES BAY PNAP SURVEY FORM

BACKGROUND

1. ECOLOGICAL DISTRICT:

2. SITE NAME:

3. SITE NO:

4. Location:

5. Map ref:

6. Area:

7. Altitude:

8. Aspect:

9. Photos:

Aerial

Other

10. Recorder:

11. Time spent:

Date:

Conditions:

12. Landform description/Topography:

13. Geology/Soil parent material:

14. Soils:

15. Drainage/Hydrology:

16. Landuse (productive, recreational etc):

Surrounds:

17. Tenure:

18. Landowner:

19. Contact person:

20. Address:

21. Phone no:

22. Legal access (yes/no):

23. Legal description:

24. Nearest public road:

25. Other background comments:

VEGETATION

Site Name:

Site No:

26. Vegetation description (types, structure):

% area

27. Vegetation dynamics (circle): Primary, Secondary, Induced, Don't know

28. Comments on dynamics:

29. Native plant list:

30. Exotic plant list:

FAUNA

Site Name:

Site No:

31. Native mammals:

32. Exotic mammals:

33. Birds:

34. Reptiles/Amphibians:

35. Fish:

36. Invertebrates:

CULTURAL, ISSUES

Site Name: _____

Site No: _____

37. History/Archaeology:

38. Cultural significance:

39. Modifiers/Threats:

	Degree (NLMH)	Time frame (past, present, future)				Comments
Weeds						
Animals						
Flooding						
Drainage						
Erosion						
Climate						
Mining						
Fire/burning						
Logging/cutting						
Grazing/browsing (stock)						
Topdressing						
Pollution						
Other						

ASSESSMENT

Site Name:

Site No:

40. Representativeness:

High

Medium

Low

Don't know
41. Diversity and pattern:

High

Medium

Low

Don't know
42. Rarity, special features:

High

Medium

Low

Don't know
43. Naturalness:

High

Medium

Low

Don't know
44. Long-term viability:

High

Medium

Low

Don't know
45. Size and shape:

High

Medium

Low

Don't know
46. Buffering, surrounds:

High

Medium

Low

Don't know
47. Fragility and threat:

High

Medium

Low

Don't know
48. Significance:

Local

Ecol. District

Regional

National

Don't Know
49. Other values: (recreational, educational, economic, historical, spiritual etc)

50. Protection requirements:

	Urgency			Comments
	H	M	L	
Fencing				
Weed control				
Animal control				
Covenant				
Acquisition				
Other				

51. Landowner attitude:
52. Other comments:
53. Recommendations:

MAPS/DIAGRAMS

Site Name:

Site No:

List of Common Plant Names Used in the Text

Common Name	Botanical Name
alyssum*	<i>Alyssum alyssoides</i>
arctotis*	<i>Arctotis stoechadifolia</i>
black beech	<i>Nothofagus solandri</i> var. <i>cliffortioides</i>
blackberry*	<i>Rubus fruticosus</i>
black maire	<i>Nestegis cunninghamii</i>
bracken	<i>Pteridium esculentum</i>
broom*	<i>Cytisus scoparius</i>
buddleja*	<i>Buddleja davidii</i>
cabbage tree	<i>Cordyline australis</i>
cape pond weed*	<i>Aponogeton distachyus</i>
climbing rata	<i>Metrosideros</i> spp.
crack willow*	<i>Salix fragilis</i>
curled pond weed*	<i>Potamogeton crispus</i>
evening primrose*	<i>Oenothera glazioviana</i>
fennel*	<i>Foeniculum vulgare</i>
flax	<i>Phormium</i> spp.
fuchsia	<i>Fuchsia excorticata</i>
gorse*	<i>Ulex europaeus</i>
hangehange	<i>Geniostoma rupestre</i>
hawthorn*	<i>Crataegus monogyna</i>
heketara	<i>Olearia rani</i>
hemlock*	<i>Conium maculatum</i>
Himalayan honeysuckle*	<i>Leycesteria formosa</i>
hinau	<i>Elaeocarpus dentatus</i>
hookgrass	<i>Uncinia</i> spp.
hydrilla	<i>Hydrilla verticillata</i>
iceplant*	<i>Carpobrotus edulis</i>
ivy*	<i>Hedera helix</i>
Japanese honeysuckle*	<i>Lonicera japonica</i>
kahikatea	<i>Dacrycarpus dacrydioides</i>
kaikomako	<i>Pennantia corymbosa</i>
kamahi	<i>Weinmannia racemosa</i>
kanuka	<i>Kunzea ericoides</i>
karaka	<i>Corynocarpus laevigatus</i>
karamu	<i>Coprosma robusta</i>
kawakawa	<i>Macropiper excelsum</i>
kohuhu	<i>Pittosporum tenuifolium</i>
koromiko	<i>Hebe salicifolia</i>
kowhai	<i>Sophora</i> spp.
lacebark	<i>Hoheria populnea</i>
lancewood	<i>Pseudopanax crassifolius</i>
lemonwood	<i>Pittosporum eugenioides</i>

Common Name	Botanical Name
lupin*	<i>Lupinus arboreus</i>
mahoe	<i>Melicytus ramiflorus</i>
mamaku	<i>Cyathea medullaris</i>
manuka	<i>Leptospermum scoparium</i>
mapou	<i>Myrsine australis</i>
marbleleaf	<i>Carpodetus serratus</i>
matai	<i>Prumnopitys taxifolia</i>
mingimingi	<i>Leucopogon fasciculatus</i>
miro	<i>Prumnopitys ferruginea</i>
mistletoe	<i>Ileostylus micranthus</i>
narrow-leaved nettle	<i>Urtica linearifolia</i>
ngaio	<i>Myoporum laetum</i>
nikau	<i>Rhopalostylis sapida</i>
pate	<i>Schefflera digitata</i>
pigeonwood	<i>Hedycarya arborea</i>
pine*	<i>Pinus spp.</i>
pohuehue	<i>Muehlenbeckia spp.</i>
pokaka	<i>Elaeocarpus hookerianus</i>
poplar*	<i>Populus spp.</i>
pussy willow*	<i>Salix caprea</i>
rangiora	<i>Brachyglottis repanda</i>
raukawa	<i>Pseudopanax edgerleyi</i>
raupo	<i>Typha orientalis</i>
rewarewa	<i>Knightia excelsa</i>
rimu	<i>Dacrydium cupressinum</i>
rohutu	<i>Lophomyrtus obcordata</i>
saltmarsh ribbonwood	<i>Plagianthus divaricatus</i>
spur valerian*	<i>Centranthus ruber</i>
starwort*	<i>Callitriche stagnalis</i>
supplejack	<i>Ripogonum scandens</i>
taupata	<i>Coprosma repens</i>
tawa	<i>Beilschmiedia tawa</i>
titoki	<i>Alectryon excelsus</i>
toetoe	<i>Cortaderia sp.</i>
totara	<i>Podocarpus totara</i>
tree ferns	<i>Cyathea and Dicksonia spp.</i>
tree nettle	<i>Urtica ferox</i>
tree tutu	<i>Coriaria arborea</i>
turepo	<i>Paratrophis microphylla</i>
watercress*	<i>Nasturtium officinale</i>
water milfoil	<i>Myriophyllum sp.</i>
weeping willow*	<i>Salix babylonica</i>
willow weed*	<i>Polygonum spp.</i>
wineberry	<i>Aristotelia serrata</i>

List of Plant Names for which Common names are not used

Common Name	Botanical Name
	<i>Bolboschoenus fluviatilis</i>
Niggerhead	<i>Carex secta</i>
	<i>Chara corallina</i>
Old Mans Beard*	<i>Clematis vitalba</i>
	<i>Coprosma areolata</i>
	<i>Coprosma rigida</i>
	<i>Coprosma rhamnoides</i>
	<i>Juncus spp.</i>
	<i>Muehlenbeckia ephedroides</i>
	<i>Pittosporum ralphii</i>
	<i>Scirpus lacustris</i>

List of Wildlife Mentioned in the Text

Common Name	Latin Name
Australian brown bittern	<i>Botaurus poiciloptilus</i>
Australian coot	<i>Fulica atra</i>
banded dotterel	<i>Charadrius bicinctus</i>
bellbird	<i>Anthornis melanura</i>
black-backed gull	<i>Larus dominicanus</i>
black-billed gull	<i>Larus bulleri</i>
black-fronted dotterel	<i>Charadrius melanops</i>
black flounder	<i>Rhombosolea retiaria</i>
bluegilled bully	<i>Gobiomorphus hubbsi</i>
blue duck	<i>Hymenolaimus malacorhynchos</i>
brown kiwi	<i>Apteryx australis</i>
caspian tern	<i>Hydroprogne caspia</i>
common bully	<i>Gobiomorphus cotidianus</i>
common skink	<i>Leiolopisma nigriplantare</i>
Crans bully	<i>Gobiomorphus basalis</i>
dabchick	<i>Podiceps rufopectus</i>
dwarf galaxias	<i>Falco novaeseelandiae</i>
falcon	<i>Falco novaeseelandiae</i>
fernbird	<i>Bowdleria punctata</i>
galaxiids	<i>Galaxias spp.</i>
goldfish*	<i>Carassius auratus</i>
goose*	<i>Anser spp</i>
grass carp*	<i>Ctenopharyngodon idella</i>
green gecko	<i>Naultinus elegans</i>
inanga	<i>Galaxias maculatus</i>
kaka	<i>Nestor meridionalis</i>
kakahi (freshwater mussel)	<i>Hyridella menziesi</i>
kokopu	<i>Galaxias spp</i>
koura	<i>Paranephrops sp</i>
longfinned eel	<i>Anguilla dieffenbachii</i>
long-tailed bat	<i>Chalinolobus tuberculatus</i>
marsh crake	<i>Porzana pusilla</i>
mute swan*	<i>Cygnus olor</i>
New Zealand pigeon	<i>Hemiphaga novaeseelandiae</i>
New Zealand scaup	<i>Aythya novaeseelandiae</i>
paradise shelduck	<i>Tadorna variegata</i>
peripatus	<i>Peripatoides novaezealandiae</i>
pied stilt	<i>Himantopus leucocephalus</i>

* Introduced Species

Common Name

pied tit
pipit
redfinned bully
rifleman
shag
shining cuckoo
shortfinned eel
smelt
South Island pied oystercatcher
spotless crake
spur-winged plover
torrentfish
tui
weka
whitebait
white-faced heron
white-fronted tern
white heron

Latin Name

Petroica macrocephala
Anthus novaeseelandiae
Gobiomorphus huttoni
Acanthisitta chloris
Phalacrocorax spp
Chalcites lucidus
Anguilla australis
Retropinna retropinna
Haematopus finschi
Porzana tabuensis
Lobibyx novaehollandiae
Cheimarrichthys fosteri
Prothemadera novaeseelandiae
Gallirallus australis
Galaxias spp (predominantly *G. maculatus*)
Ardea novaehollandiae
Sterna striata
Egretta alba

