Schedule I. Background to the Maori Dimension

1 INTRODUCTION

1.1 The review of the original Regional Policy Statement has included a review of Chapter 5: The Maori Dimension.

1.2 At this time of second-generation planning, both Regional Council and Maori of Hawke's Bay can reflect on the original Regional Policy Statement and the developed Regional Plans knowing:

(a) that the parties have made good progress towards developing a positive Council/Maori relationship

(b) that there has been a real and positive move to accommodate the statutory and the Treaty imperatives for Maori

(c) that this revision by HBRC to provide a combined RPS and a single Regional Plan for most things sets up the opportunity for Maori of Hawke's Bay to update the "Maori Perspective" as their contribution to making the dimension more intelligible and therefore more user-friendly.

1.3 As part of the review the Regional Council has consulted widely with Maori of Hawke's Bay by holding seven consultative hui in Raupunga, Mahia (Kahungunu and Rongomaiwahine), Tuai (Ruapanui/Tuhoe/Kahungunu) Wairoa, Napier, Hastings and Porangahau. A synopsis of these hui are available as a background report to the Plan.

1.4 The purpose of the consultation was to advise Maori of the plan review and to invite them to re-state the issues of significance to them. Understandably, Rongomaiwahine (Mahia) and the people of Tuai have indicated that they wish to express their rangatiratanga independently. Therefore, the views expressed in this section are predominantly, though not exclusively, of Ngati Kahungunu. Nevertheless, these Iwi share common principles, with the exception that 'tikanga' to Ngati Kahungunu is 'kawa' to Tuhoe and their concepts of each may differ.

1.5 The only iwi plans available to Regional Council are "Kaitiakitanga Mo Nga Taonga Tuku Iho" (Runanganui O Ngati Kahungunu, December 1992) and "Nga Tikanga O Te Whanau " (O Rongomaiwahine Policy Statement, October 1992). Where possible aspects of both documents have been used to update this part of the Policy Statement/Regional Plan.

1.6 This Schedule provides background information on aspects of the Maori dimension which expand on the context in which it is set. This information includes: the Principles of the Treaty of Waitangi; the Maori conservation ethic and tikanga and taonga.

2 PRINCIPLES OF THE TREATY OF WAITANGI

2.1 Section 8 of the Resource Management Act requires all persons exercising functions and powers under it to take into account the principles of the Treaty of Waitangi. To tangata whenua those principles, based on interpretations by the Courts and the Waitangi Tribunal and as applied in the context of sustainable management of natural and physical resources under the Act, mean as follows:

The Principle of Te Tino Rangatiratanga

2.2 Te tino rangatiratanga (full chiefly authority) over resources including lands, forests, fisheries and other taonga were guaranteed to Maori under Article II of the Treaty. Tino rangatiratanga includes tribal self-regulation of resources in accordance with their own customary preferences. Tino rangatiratanga was not, nor was it ever intended to be, relinquished or given away by Maori to the Crown.

The Principle of Partnership

2.3 The Treaty signified a partnership between Maori tribes and the Crown. The exchange of promises under Articles I and II of the Treaty is seen as an exchange of gifts. The gift of the right to make laws and the promise to do so as to accord the Maori interest in appropriate priority. Utmost good faith, reasonable co-operation and compromise are fundamental to this concept of a partnership.

The Principle of Kawanatanga

2.4 Kawanatanga, as ceded by Maori under Article I of the Treaty, gave the Crown the right to govern and to make laws applying to everyone. The delegation of resource management powers by the Crown to local authorities under the Act means that those authorities can make policies, set objectives and make rules affecting the management of natural and physical resources, subject to the guarantee of tino rangatiratanga to Maori and recognition of the partnership between Maori and the Crown.

The Principle of Active Partnership and Consultation

2.5 The spirit of the Treaty calls for Maori to have a much greater say in the management of the environment. Effective, early and meaningful consultation is an integral and necessary component and forerunner to greater participation by Maori in resource management decision-making.

The Principle of Active Protection

2.6 The guarantee of te tino rangatiratanga given in Article II is consistent with an obligation to actively protect Maori people in the sue of their lands, water and other protected taonga, to the fullest extent practicable. In the context of resource management, the various elements which underlie and are fundamental to a spiritual association with the environment (including mauri, tapu, mana, tikanga and wairua) may all fairly be described as taonga that have been retained by Maori in accordance with Article II of the Treaty. The principle of active protection therefore extends to the spiritual values and beliefs of Maori.

The Principle of Hapu/Iwi Resource Development

2.7 Article III of the Treaty gave to Maori the same rights and duties as other New Zealand citizens. The Treaty guaranteed to Maori retention of their property rights under Article II, and the choice of developing those rights under Article III. To Maori, the efficient use and development of what are in many ways currently under utilised hapu/iwi resources is a very important principle of the Treaty in the context of resource management under the Act. Ngati Kahungunu seek restoration of their tribal resources in accordance with their own needs and aspirations. In pursuing development, Maori may choose to pursue non-traditional uses of their resources instead of or as complementary to, their traditional practices. Recognition of the ability and need for hapu/iwi to develop their resources in a manner which achieve the purposes of the Act is a fundamental principle embodied in the Treaty.

3 THE MAORI CONSERVATION ETHIC

3.1 In essence, this ethic involves the preservation of mauri – simplistically translated as the 'life-force' – and the conservation of the species. Where the habitat remains healthy a specie will flourish allowing usage that is mindful of conservation.

3.2 The notions of kaitiakitanga:

- stewardship that respects the heritage of future generations
- mana and rangatiratanga depicting the power and leadership to exercise kaitiakitanga
- tapu/rahui as the management system for the conduct of kaitiakitanga

all contribute to the application of the ethic.

3.3 To appreciate fully the depth of meaning and the profound implications of these terms, one needs to go back to Maori cosmogenic origins. The Maori version of Creation embodies both spiritual and physical concepts of the world's origins. In terms of tradition, those origins should properly be given in Maori. For the purposes of this statement, however, the english approximations are used.

3.4 Maori believe that in the beginning there were three states of reality. The first state was Te Korekore from which emerged Io-Matuakore – or Io, the parentless one. The second state was Te Po within which Io created Ranginui (Sky Father) and Papatuanuku (Earth Mother). Within the darkness of their embrace Ranginui and Papatuanuku begat many deities called atua. The third state of reality was Te Ao-Marama brought about when one of the atua called Tane separated his parents to form sky and earth.

3.5 As with Ranginui and Papatuanuku, these deities or atua had the power to create. Dominant among them was Tane, who created natural and physical covering for the land and was god of the forests; Tangaroa created the marine life and presided over the oceans; Tawhirimatea took to the heavens out of sympathy for Ranginui and from there he presided over the elements.

3.6 Tane was also the creator of humans, the first of whom, a woman, was fashioned from the soil of Papatuanuku. Although these atua or deities had the power to create, only Io-Matuakore could grant the gift of Mauri – that is, the life force – for those things that make up the natural and physical world. The atua had to seek delegated approval to imbue their creations with Mauri that those creations may live.

3.7 If rangatiratanga is 'authority' and tino-rangatiratanga is "ultimate authority" then only Io can truly be said to have tino-rangatiratanga, which he exercised by creating Ranginui and Papatuanuku who begat the deities responsible for the terrestrial and celestial environment including human genesis.

3.8 The Maori was born into this physical world and became part of it. Whakapapa, or genealogy, is sacred to Maori because it not only establishes whanaungatanga links within society but also within the physical environment and more especially the wairua or spiritual links back to Io-Matuakore.

3.9 Genealogical links are readily understood. The relationship links to the environment are typified by the notion that the trees of the forest, for example, like Maori, are "Children of Tane". The spiritual links recognise that Mauri comes only from Io and represents the paramount gift of all taonga tuku iho, or god-given gifts.

3.10 While the ultimate homage is given to Io, the values system that emanates from these cosmogenic origins recognises the role that the lesser deities served in the creation process that gave rise to an evolutionary physical environment. No taonga or resource is used without prior propitiation to the creator-deity. They were the first kaitiaki from whom Maori inherited the whakapapa right to exercise kaitiakitanga or perpetual stewardship.

4 TIKANGA AND TAONGA

4.1 The predominant view of Maori in Hawke's Bay is that the identification of their values and interests must start from an understanding of the philosophical basis for Maori beliefs and customs. The essence of that philosophy arises from the significant differences, in traditional Maori society, between the concepts of tikanga and taonga.

4.2 TIKANGA

4.2.1 Tikanga comprises the values, norms and practices of Maoridom. This is represented by both the notions of whakaaro and matauranga, which when brought together represented wisdom. Tikanga, in a traditional context, comprised "the three kits of knowledge" representing all the knowledge and the values, norms, rituals and protocols.

4.2.2 The three kits of knowledge are:

(a) Te kete Tuwari - This kit contains the scientific knowledge or that knowledge pertaining to human activities or to natural phenomena relating to the kingdom of nature (matauranga).

(b) Te kete Arounui - This kit consists of celestial and cosmogenic information designed to benefit humankind (that is, the anthropogenic mythologies), or whakaaro.

(c) Te kete Tuatea - This kit comprises all the rituals, acts and formulae with all things on earth in the cosmos (that is, retinga and kawa).

4.2.3 The matauranga based values are reflected within the need to protect resources and their mauri through the use of institutions such as rahui and tapu.

4.2.4 Together the notions of whakaro and matauranga combine to form the notion of tikanga which may be explained as being Nga Tikanga Maori – their own ways, rules, conditions of proper conduct or lifestyle, exercised through the binding concepts of wairuatanga, whanaungatanga, rangatiratanga, kotahitanga, and manaakitanga.

4.2.5 From a Ngati Kahungunu standpoint these tikanga value concepts are god-given and therefore immutable or changeless – fixed as in the case of the upper jaw (Kauae runga). Kawa, on the other hand, is one of the dynamic processes, protocols and practises deriving from the value concepts to provide a living evolutionary culture – flexible as is the case of the lower jaw (Kauae raro). While tikanga has iwi-wide application, kawa can, and very often does, differ from hapu to hapu within a single iwi, a pertinent point for the purpose of consultation, and management decisions.

4.3 TAONGA

4.3.1 Taonga encompasses all things tangible or intangible and derive their meaning at both the physical and spiritual levels. Taonga comprises all treasures inherited from the past, to the present, and for future generations. At a spiritual level, taonga includes the three great states of reality - Te Kore Kore, Te Po and Te Ao Marama - and all that was created out of those states. At a physical level, taonga is manifested in the physical states of moana through to whenua. The notion of mauri is representative of a continuum involving mana, wehi, ihi, tapu and wairua that embraces both the physical and the spiritual.

4.3.2 THE RELATIONSHIP BETWEEN TIKANGA AND TAONGA

4.3.2.1 The predominant view of Maori in Hawke's Bay is that the concepts of tikanga and taonga are strongly inter-related due to the importance of cosmogony and the spiritual dimension within both taonga and tikanga. It is from these concepts that Maori decision-making processes and the structure of Maori society emerge.

Schedule II. Sustainable Land Use

1 INTRODUCTION

1.1 One of the more challenging areas arising from the implementation of the RMA is the development and application of methods to monitor and encourage the sustainability of land use. The HBRC has adopted a "minimum regulation" approach to land use. Such an approach relies upon the provision of information to land users to assist them in making land use decisions which lead toward sustainably managing the land resource.

1.2 As part of its land use management function the HBRC has undertaken a programme which looks at existing land use cover, identifies sustainable land uses, and then compares the two sets of information to see where they do not match. The areas of mis-match represent areas of the region where land is being used outside its level of sustainability. This Schedule presents this information in the following form:

- A map of existing land uses (i.e. the Land Cover Map in Schedule 2 Maps).
- A map of sustainable land uses (derived from a Sustainable Land Use Index).
- A map identifying areas of mismatch between existing land uses and sustainable land uses.

1.3 After this Introduction, this Schedule describes the purpose of the maps, and then sets out the methodology used to derive each of the maps.

2 PURPOSE

2.1 There are two key purposes for the type of information presented in the maps in this Schedule:

(a) to track changes in sustainable land use that occur over time within the region, and
(b) to provide Council with guidance as to the areas that could be targeted for its land management programmes. If a person is using an area of land outside its suite of sustainable land uses, HBRC staff will provide them with advice (and possible assistance) on ways to change land use practices so that they fit with the physical limitations of the land.

2.2 The HBRC has a number of programmes covering farm plans, one-on-one advice, education programmes and financial grants/incentives that can assist appropriate activities to take place.

2.3 In using the information contained within this Schedule it is important to note the following:

(a) That it is <u>not</u> the intention of the HBRC to use this as the basis for regulating what types of use a piece of land should be put to (rather it is targeted at the implementation of non-regulatory methods, as described in section 3.2 of this Plan).
(b) That the information is presented at a region-wide scale, not a scale suitable for farm-by-farm interpretation. A farm-based comparison of existing land uses with sustainable land use could only be achieved by inspecting the farm.

3 LAND COVER

3.1 The HBRC contracted Terralink to prepare a Land Cover Database of Hawke's Bay using SPOT satellite imagery. Eleven SPOT multi spectral scenes were required to cover the region and ranged in acquisition date from 1995 to 1997. There was a ground accuracy of ± 25 m (with a 90% confidence limit).

3.2 The minimum mapping unit for the classification was 1 hectare. The land cover legend, set out below, resulted from discussions between Terralink and the HBRC to ensure that the classification was relevant to Hawke's Bay.

LEGEND : LAND COVER MAP USING SPOT IMAGES	
Primarily Horticulture	Dune Vegetation
Primarily Pastoral	Coastal Wetlands
Forestry planted >5 years	Inland Water
Forestry planted 2-5 years	Inland Wetlands
Clearfelled Forests	Bareground
Indigenous Forests	Recreational
Shrubland	Mine
Predominantly Tussock	Urban
Riparian Trees	Unclassified
Conservation Planting	Shelter Belt

4 SUSTAINABLE LAND USE INDEX

4.1 The sustainable land use index was derived by experienced land management staff of the HBRC interpreting the physical capability of the land and identifying a range of uses that each area of land was physically capable of being sustainably used for. The information is presented as a series of maps and forms a part of this Schedule.

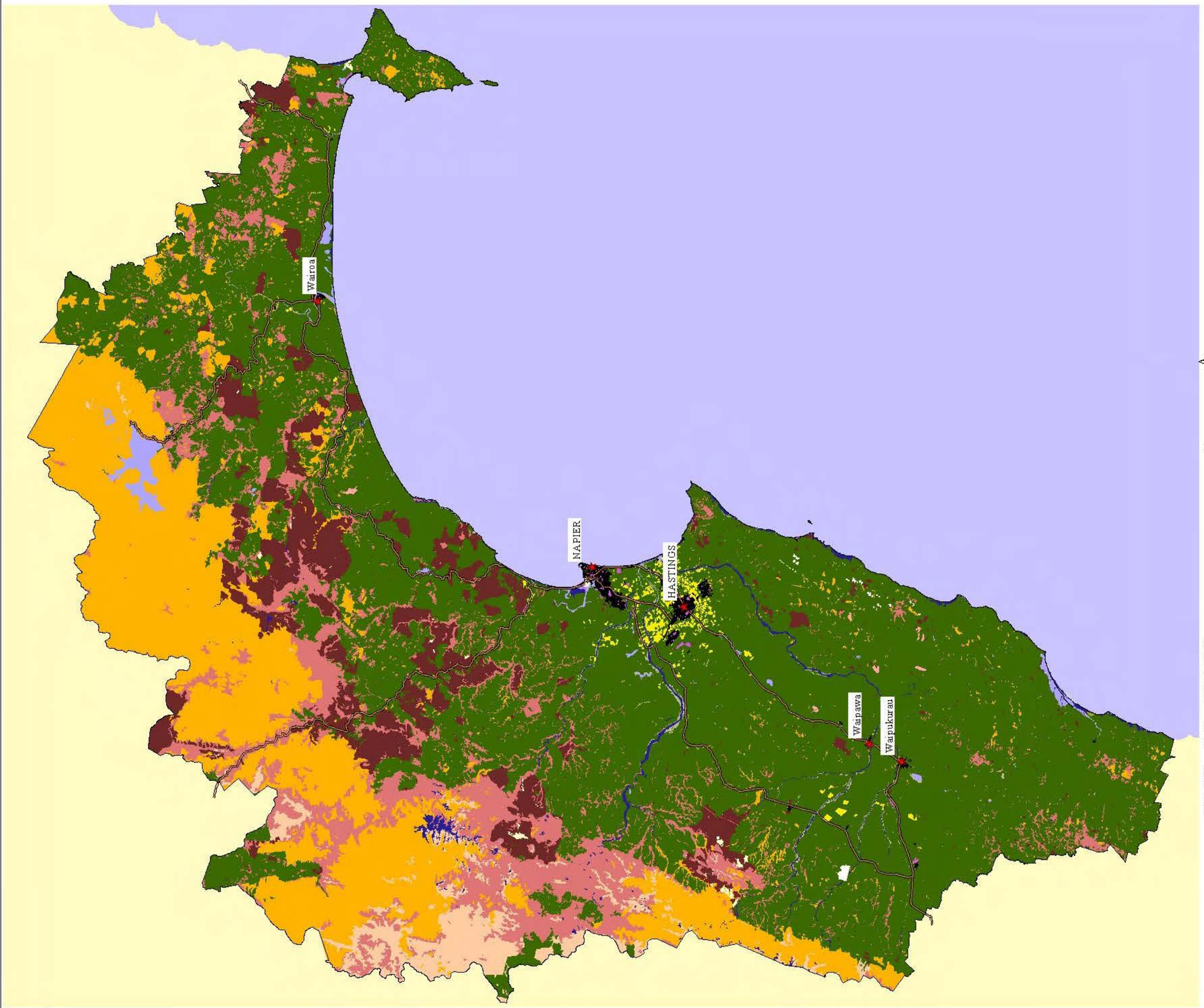
4.2 The interpretation was based on Land Resource Inventory Sheets, a national land resource survey carried out in the 1970's and 80's which classified land according to its physical capabilities and limitations. A total of 117 different types of land (i.e. "Land Use Capability" units) were identified within the Hawke's Bay region. These were grouped together into areas of land with similar physical limitations, which have the same potential uses and which require the same soil conservation measures. A range of seven physically sustainable land uses groups was derived and are described in the table below:

RANGE OF PHYSICALLY SUSTAINABLE LAND USES						
HORTICULTURE	Cropping	Dairying	Pasture	Pasture & Trees	Forestry	Protection
	CROPPING	Dairying	Pasture	Pasture & Trees	Forestry	Protection
		DAIRYING	Pasture	Pasture & Trees	Forestry	Protection
			PASTURE	Pasture & Trees	Forestry	Protection
				PASTORAL FARMING WITH TREES	Forestry	Protection
					FORESTRY	Protection
						PROTECTION

4.3 The index is based on seven broad land uses which are representative of those relevant to Hawke's Bay. These are arranged in order of increasing versatility so that land assessed as having its highest level of sustainable use as protection planting had no other options, whereas horticultural land could also be used for cropping, dairying, pastoral farming, pastoral farming with trees or forestry uses. Each of the 117 land use capability units was assigned to one of the seven sustainable land uses by the HBRC's Land Management team. Their assessment was based on the collective experience of the team members and followed discussion as to past experiences of different uses on that land use capability unit.

5 IDENTIFICATION OF AREAS OF 'UNSUSTAINABLE' LAND USE

5.1 Using a GIS overlay analysis of the two sets of maps, areas where the current land use (interpreted from the land cover) is not within the sustainable land use level were identified and plotted. Each map was prepared at a scale of 1:300,000, which enabled a consistent regional presentation but did not encourage enlargement to farm scale.



LEGEND

- Placenames
- Railway
- Main Highways
- Primarily Horticulture
- Primarily Pastoral
- Planted Forests
- Planted Forests
- Clearfelled Forests
- Indigenous Forests
- Shrubland
- Predominately Tussock
- Riparian Trees
- Conservation Planting
- Dune Vegetation
- Coastal Wetlands
- Inland Water
- Inland Wetlands
- Bare Ground
- Recreational
- Mine
- Urban
- Unclassified

N

5 0 5 10 15 20 Kilometers

RELIABILITY: Land cover information is derived from mapping at 1:50,000 scale and should not be relied upon for measurements at scales larger than this.

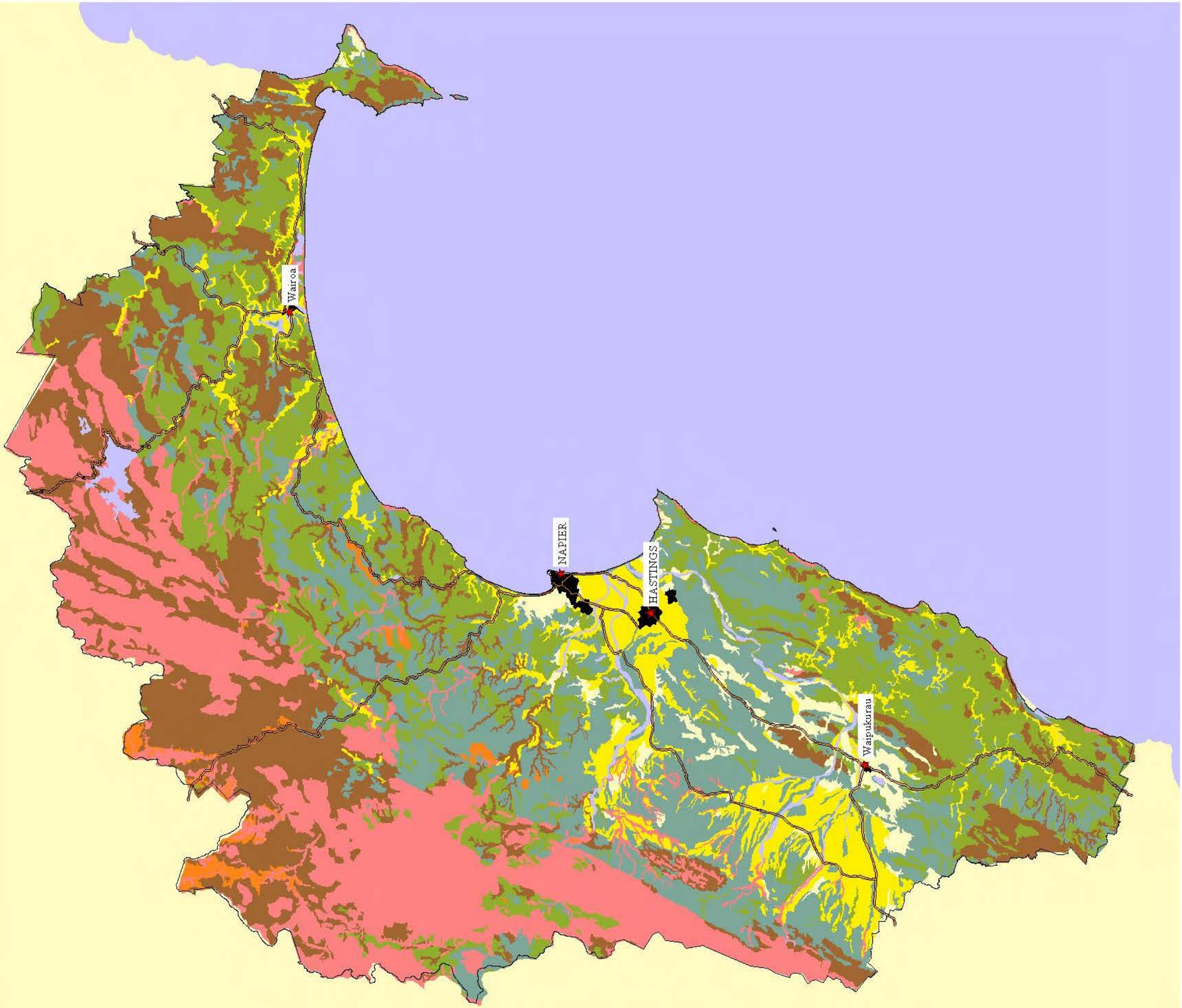
DATA FROM: Land cover information obtained from Terralink New Zealand Ltd,

Cadastral Information and Digital Terrain Information obtained from Land Information New Zealand.

HAWKE'S BAY REGIONAL COUNCIL

RESOURCE MANAGEMENT PLAN

Schedule II
Land Cover 1995-1996



LEGEND

- Placenames
- Railway
- Main Highways
- Regional Roads

- Cropping
- Dairying
- Forestry
- Horticulture
- Pastoral Farming
- Pastoral Farming with Trees
- Protection
- Lakes and Rivers
- Urban

N

Kilometers
20 10 0 10

RELIABILITY: Sustainable land use information is derived from mapping at 1:63,360 scale and should not be relied upon for measurements at scales larger than this.

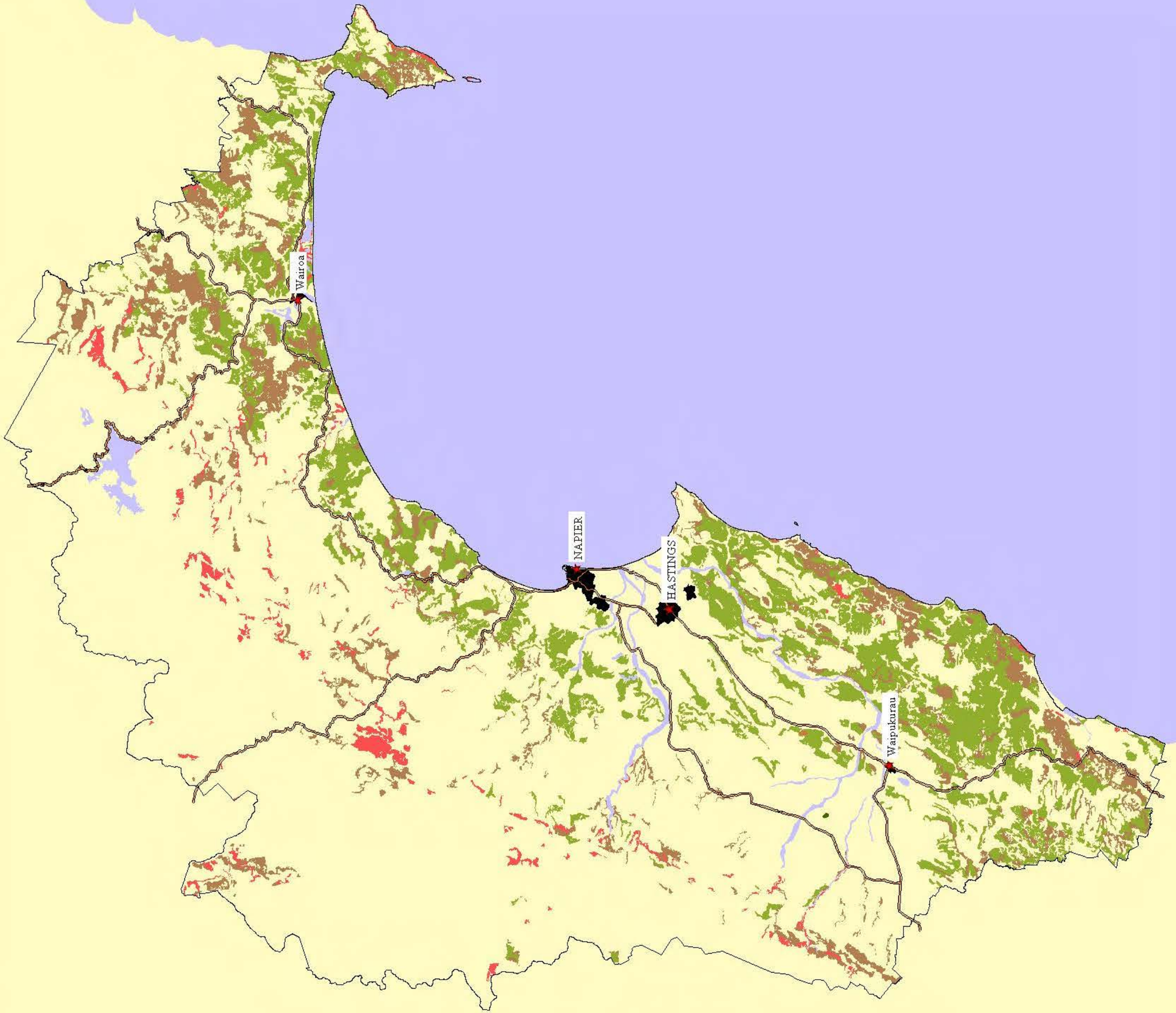
DATA FROM: Land Resource Inventory obtained from Landcare Research New Zealand Ltd, New Zealand Land Resource Inventory Computer Archive. Landcare Research New Zealand Ltd, Private Bag 11052, Palmerston North.

Cadastral Information and Digital Terrain Information obtained from Land Information New Zealand.

HAWKE'S BAY
REGIONAL COUNCIL

RESOURCE MANAGEMENT PLAN

Schedule II
Sustainable Land Use Capability



LEGEND

- Placenames
- Railway
- Main Highways
- Regional Roads
- Forestry
- Pastoral Farming
- Pastoral Farming with Trees
- Protection
- Lakes and Rivers
- Urban

N

Kilometers

20 10 0 10

RELIABILITY: Sustainable land use information is derived from mapping at 1:63,360 scale and should not be relied upon for measurements at scales larger than this.

DATA FROM: Land Resource Inventory obtained from Landcare Research New Zealand Ltd, New Zealand Land Resource Inventory Computer Archive. Landcare Research New Zealand Ltd, Private Bag 11052, Palmerston North.

Cadastral Information and Digital Terrain Information obtained from Land Information New Zealand.

HAWKE'S BAY
REGIONAL COUNCIL

RESOURCE MANAGEMENT PLAN

Schedule II
Extent of Areas of Unsustainable Land Use

Schedule III. Environmental Guidelines for Surface Water Quality

1 INTRODUCTION

1.1 The Hawke's Bay Regional Council undertakes monitoring of the water quality in the regional waterways as part of the State of the Environment (SOE) monitoring. Various determinants are used in which to assess the water quality:

- Faecal coliform bacteria.
- Macro-invertebrates.
- Total ammonia.
- Suspended solids.
- Electrical conductivity.
- Soluble reactive phosphorous.

1.2 Mean concentrations are used to represent the water quality over the preceding years with the exception of the faecal coliform bacteria figure where median values are used. Due to limited macro-invertebrate data the figure is representative of only the last two years. No analysis of trends over time has been provided as the nature of the monitoring programmes has not lent itself towards this. The information does establish the background quality in which the guidelines have been developed and sets levels against which the performance of this plan may be monitored.

2 FAECAL COLIFORM BACTERIA

2.1 Faecal coliform bacteria and macro-invertebrates are two determinants that are typically used to assess the quality of the water and to gauge the effects of municipal & industrial discharges, land use practices and activities on or within the water body.

2.2 Faecal coliform bacteria are derived principally from the gut of mammals (warm blooded vertebrates) and are contained in their faecal material. Faecal coliforms are used to indicate the presence of potentially pathogenic bacteria, protozoans, and viruses. The concentration of faecal coliforms found within the water body is used to assess the risk to human and animal health. No differentiation is currently made as to the derivation of the faecal coliform bacteria i.e. whether the source is human or animal, although techniques are being developed to enable differentiation to be made. Presently the risk is assumed to be similar independent of the origin, as borne out by national research. Current research is being directed towards identifying the appropriateness of indicator species and the relationship between source of faecal material and health risk. Faecal coliform bacteria have been used as an indicator of Hawke's Bay water quality for some years (dating back to 1971 at some sites). And although directly applicable to recreational water quality under the Water and Soil Conservation Act 1967, it has now been superseded by *e coli* in freshwater, (a species within the faecal coliform bacteria group), and enterococci in marine waters.

2.3 The various guideline/standard values that have been used for assessing the concentration of faecal coliform bacteria and the associated risk to health, the three common ones are:

(a) 0 faecal coliform bacteria (cfu/100 mls) to safeguard human health for drinking purposes (current standard).

(b) Less than 200 faecal coliform bacteria (cfu/100 mls) for recreational use (bathing) (no longer current).

(c) Less than 1000 faecal coliform bacteria (cfu/100 ml) to safeguard animal health for drinking purposes (a current standard).

2.4 This bacteria however is still being used as a state of the environment indicator for reasons noted above, but where compliance to recreational suitability guidelines is concerned *e coli* and enterococci are utilised. To monitor changes within the catchment the faecal coliform group of bacteria are useful indicators and will enable a continual assessment of the state of the waters to be made.

2.5 As well as identifying the risk to health faecal coliform bacteria can help in identifying the presence or potential for other contaminants to be present in the waterway. With increasing bacterial numbers it can be inferred that nutrient concentrations will also increase. An over abundance of nutrients (in excess) can lead to undesirable biological growths manifesting themselves in waterways. This can then lead to reduced clarity, reduced dissolved oxygen, and increased temperatures and pH. The result of this can be a choking of the waterways (eutrophication) reducing the habitat and fishery value and reducing the potential uses of the water e.g. stock water, potable water, irrigation, recreational use, and fishery values.

2.6 Typically levels of faecal coliform bacteria increase with decreasing distance to the coast, which often corresponds to change in land use practises i.e. increasing agricultural intensification. In other cases direct discharges or poor land management practices can lead to localised degradation, although it needs to be borne in mind that other contaminants do not die off or become assimilated readily and can accumulate causing downstream problems (sediments and nutrients).

2.7 The waters that are 'cleanest' are found within the headwaters of each catchment with degradation as distance from the coast diminishes. Those sampled include:

- Sandy Creek (Aropaonui river catchment).
- Clive River including Awanui stream, Irongate Stream, Kawarewa Stream and Poukawa Stream.
- Opoutama Stream.
- Kopuawhara Stream.
- Ikanui Stream.
- Mangakuri River.
- Waipuka Stream.
- Waigongoro Stream.
- Waipataki Stream.
- Nuhaka River.
- Porangahau River including Mangaorapa Stream.
- Te Ngaru Stream.
- Whakaki Lagoon catchment, specifically streams Waikatutu Stream, Tahuru Stream and Whakaki Drain.

2.8 Other areas identified include:

- The Tukituki River around Waipawa, Waipukarau area including tributaries of the Tukituki River specifically Mangatarata Stream, Papanui Stream, Porangahau Stream.
- Tributaries of the Tutaekuri River specifically Awatoto Drain and lower Tutaekuri.
- Wairoa River including the lower tributaries, specifically Ruakituri River.

3 MACRO-INVERTEBRATES

3.1 Another index that can be used to assess the overall water quality (in relation to the aquatic ecology) is that of the macro-invertebrates (MCI index). Unlike bacteriological water quality that gives a result relevant to that point in time, and accordingly requires a number of samples to be taken before trends can be established, the MCI index is more robust and is useful for making an assessment of long term water quality. The MCI index is able to be used to assist in establishing the 'health' of the instream community. Unlike faecal coliform bacteria a large number is indicative of a 'healthy' stream.

3.2 In the maps prepared as part of the State of the Environment Annual Update results of the late summer MCI index are plotted. Markers of differing colour intensity are used to depict the relative MCI index. The bars are used to denote the number of taxa found at each site, the longer the bar the greater the number of taxa and therefore the better the water quality. The map illustrates trends similar to that found with faecal coliform bacteria i.e. decreasing water quality with diminishing distance to the coast. The Ruataniwha Plains area is further identified as having reduced water quality with intensive agriculture and pastoral grazing likely to be the main contributors. Factors that would come into this are:

- reduced canopy cover
- grazing of riparian areas
- cultivation close to or into tributaries of the main river systems
- increased temperature (due to direct exposure, see first point)

- reduced riparian vegetation
- increased runoff through irrigation
- fertiliser application close to or into ephemeral stream areas.

4 TOTAL AMMONIA

4.1 Ammonia is toxic to aquatic life at low concentrations, and has been used to indicate the immediate effect that the water quality may be having on the instream life. Direct discharges to the waterways of faecal contaminants, decaying organic material and deoxygenated areas overlying organically enriched substrates can contribute to the total ammonia concentrations. For the protection of aquatic life low concentrations of this determinant should be present.

4.2 In general results show a region of good quality with trends similar to that noted for the other determinants above. Land use changes can have a dramatic effect on the total ammonia. Monitoring the concentrations of total ammonia during the course of the draft plan will enable the assessment of trends over time (representing changes in land use/practices/management), and the identification of problems if they occur in the areas monitored. The effectiveness of the plan (performance) will also be able to be gauged.

5 SUSPENDED SOLIDS

5.1 Suspended solids can be used to identify the clarity of the waters, potential for other contaminants to be present, landuse practices and management, and potential impact on the instream fishery. In times of floods high suspended solids concentrations arising from runoff and erosion can also indicate nutrient input. Although nutrients are needed to sustain plant growth both instream and out of stream, elevated levels sustained at high levels for periods of time may lead to choking and undesirable growths occurring in the water ways. Suspended solids are also used to assist in the characterisation of the catchment. In general terms, the regions water are of a good quality with the lowland rivers and streams being identified as having elevated levels of suspended solids. Efforts made in protecting the lowland streams and minor tributaries of the major rivers could see improvements in the concentrations noted in this baseline.

6 ELECTRICAL CONDUCTIVITY

6.1 Electrical conductivity is seen as a surrogate for contamination in general terms. Geology influences the baseline conductivity to some extent as dissolved minerals (as a result of waterways passing though limestone formations) elevate the concentrations. However this is taken into consideration when analysing conductivity and adjusted for in the interpretation. Conductivity can be useful for characterising the catchment and rivers.

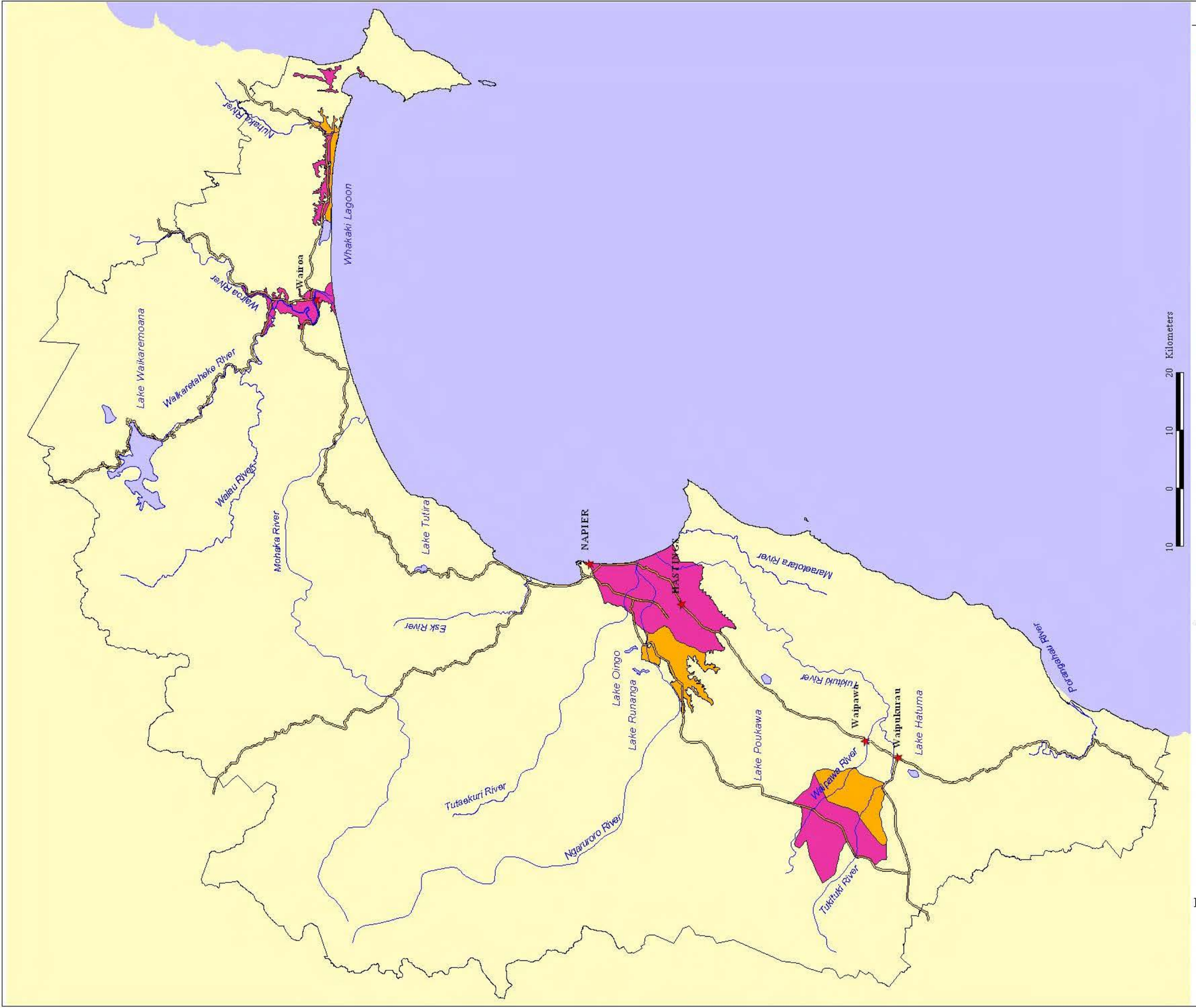
6.2 State of the Environment results show that the waters that are 'cleanest' are found within the headwaters of each catchment with degradation as distance from the coast diminishes. Improvements made in water quality will be reflected in the conductivities exerted for the waters i.e. lower. A useful indicator for assessing the overall contaminant load present and to track changes over time and distance.

7 SOLUBLE REACTIVE PHOSPHORUS

7.1 Soluble reactive phosphorus is generally deficient in the Hawke's Bay region, which leads to an almost oligotrophic state (low biological diversity and/or abundance) in many of the region's rivers headwaters. This pristine condition, as it is often referred to, does not necessarily mean an ideal situation as some instream plant growth is essential to ensure good biodiversity and thus health.

7.2 Normal farming practises, substrates and vegetative decay do contribute to increasing concentrations of this determinant in the waterways as distance from the coast diminishes. With this determinant being limited in the upper catchment enables targeting of this determinant if reduction in instream plant growth is required. Prolific growths of algal slimes and larger plants (e.g. oxygen weeds) have been experienced in a number of the lower Hawke's Bay rivers (Tukituki, Karamu, Tutaekuri). Improvements in land management techniques and removal of unwanted discharges will see a further reduction in instream soluble reactive phosphorus concentrations.

7.3 Care needs to be taken in the assessment of concentrations in relation to other biological indicators such as *chlorophyla* and algal biomass to ensure prolific instream plant growth is not masking the effects of soluble reactive phosphorus through luxuriant plant growth.



LEGEND

- Placenames
- Main Highways
- Rivers and Streams
- Confined
- Unconfined

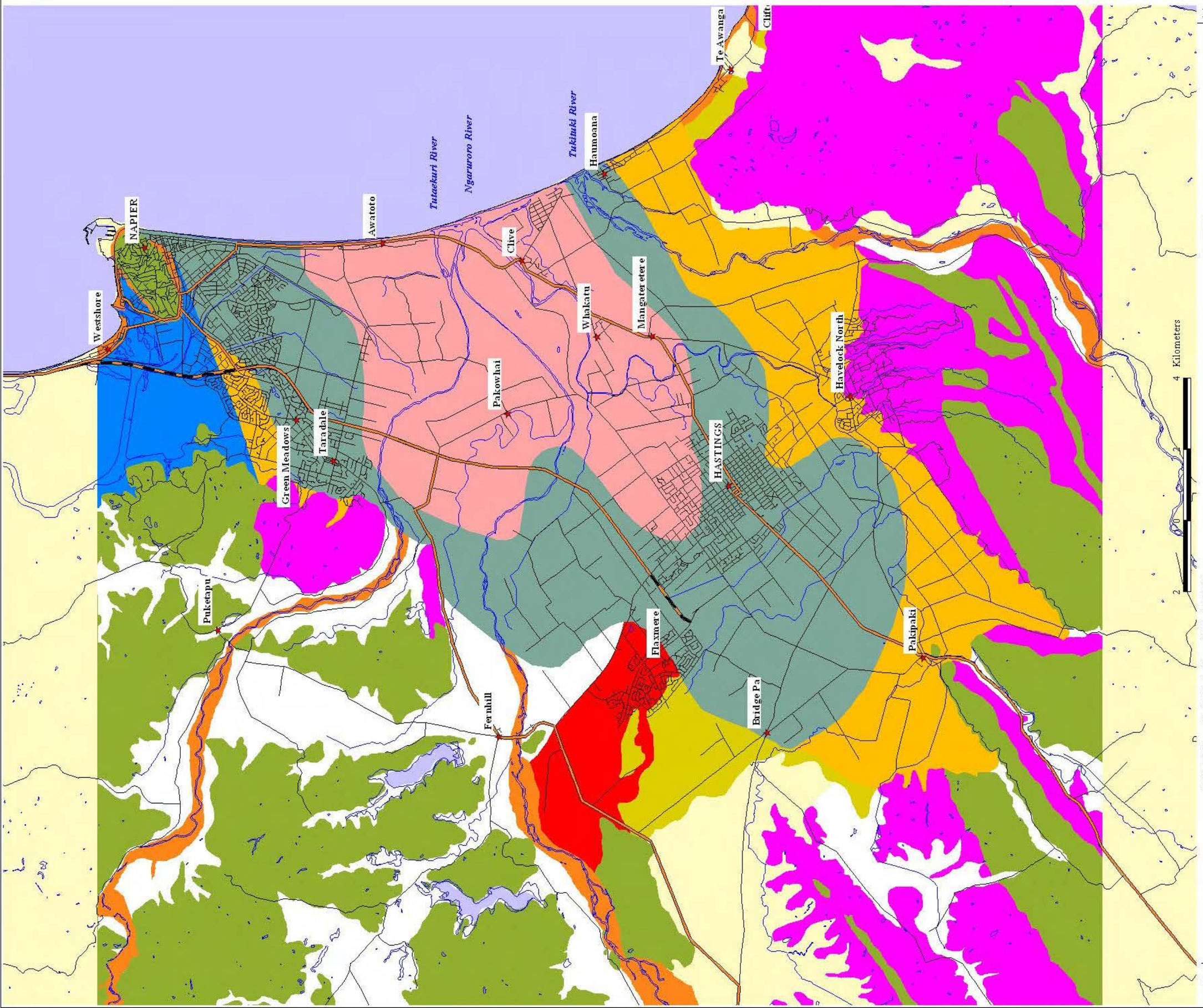
RELIABILITY: Productive aquifer system information is derived from mapping at 1:50,000 scale and should not be relied upon for measurements at scales larger than this.

DATA FROM: Cadastral Information and Digital Terrain Information obtained from Land Information New Zealand. CROWN COPYRIGHT RESERVED.

HAWKE'S BAY REGIONAL COUNCIL

RESOURCE MANAGEMENT PLAN

Schedule IV
Known Productive Aquifer systems in the Hawke's Bay Region



LEGEND

- Placenames
- Railway
- Main Highways
- Regional Roads
- Most vulnerable
- Least vulnerable

RELIABILITY: Modified DRASTIC factors is derived from mapping at 1:50,000 scale and should not be relied upon for measurements at scales larger than this.

DATA FROM: DRASTIC factors obtained from the Hawke's Bay Regional Council Geographic Information System. COPYRIGHT HAWKE'S BAY REGIONAL COUNCIL.

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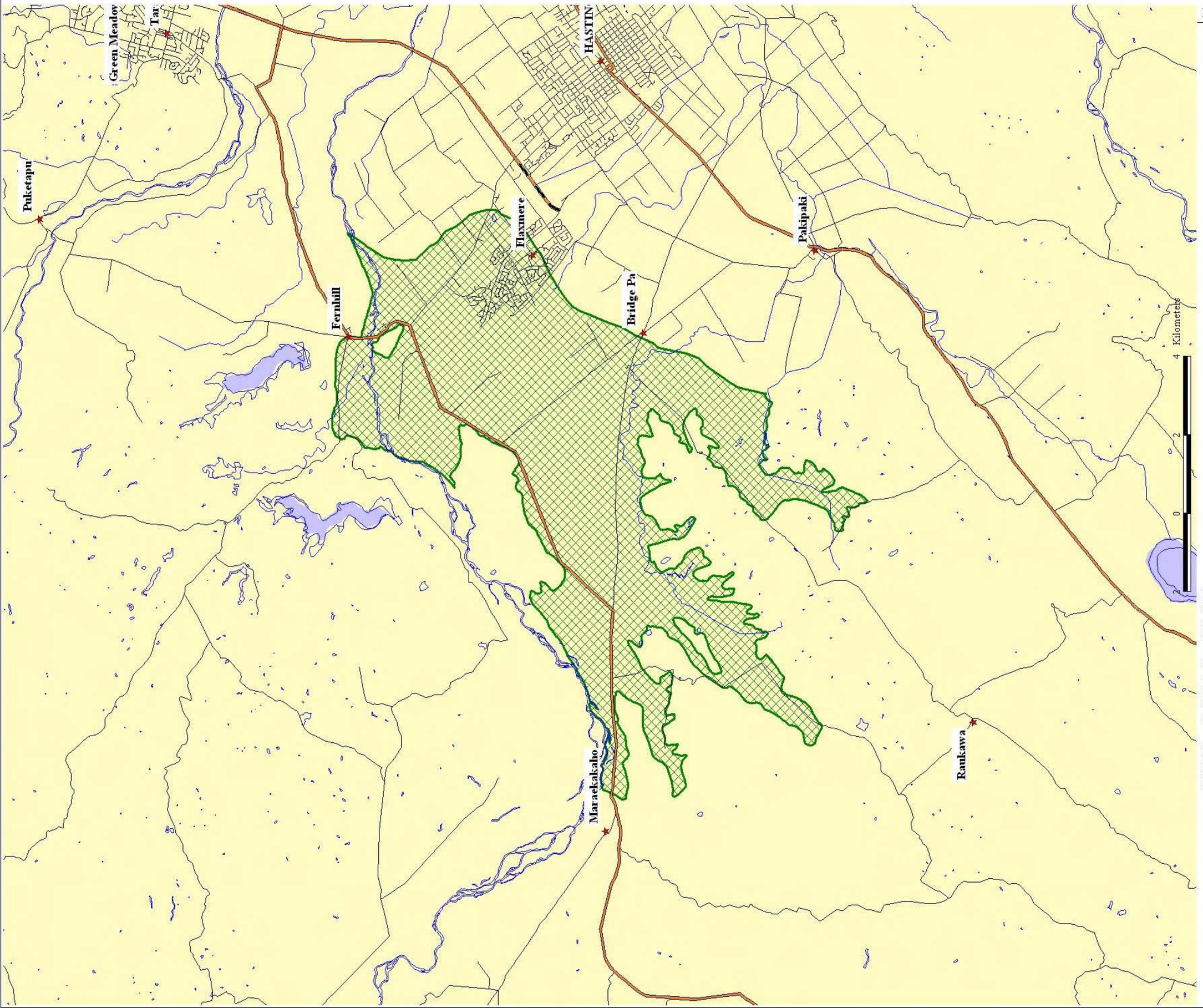
REGIONAL COUNCIL

RESOURCE MANAGEMENT PLAN

Schedule V
Heretaunga Plains
- Contaminated vulnerability based on specifically modified DRASTIC factors for confined aquifers.



LEGEND

- Placenames
- Railway
- Main Highways
- Regional Roads
- Unconfined aquifer

RELIABILITY: Unconfined aquifer is derived from mapping at 1:50,000 scale and should not be relied upon for measurements at scales larger than this.

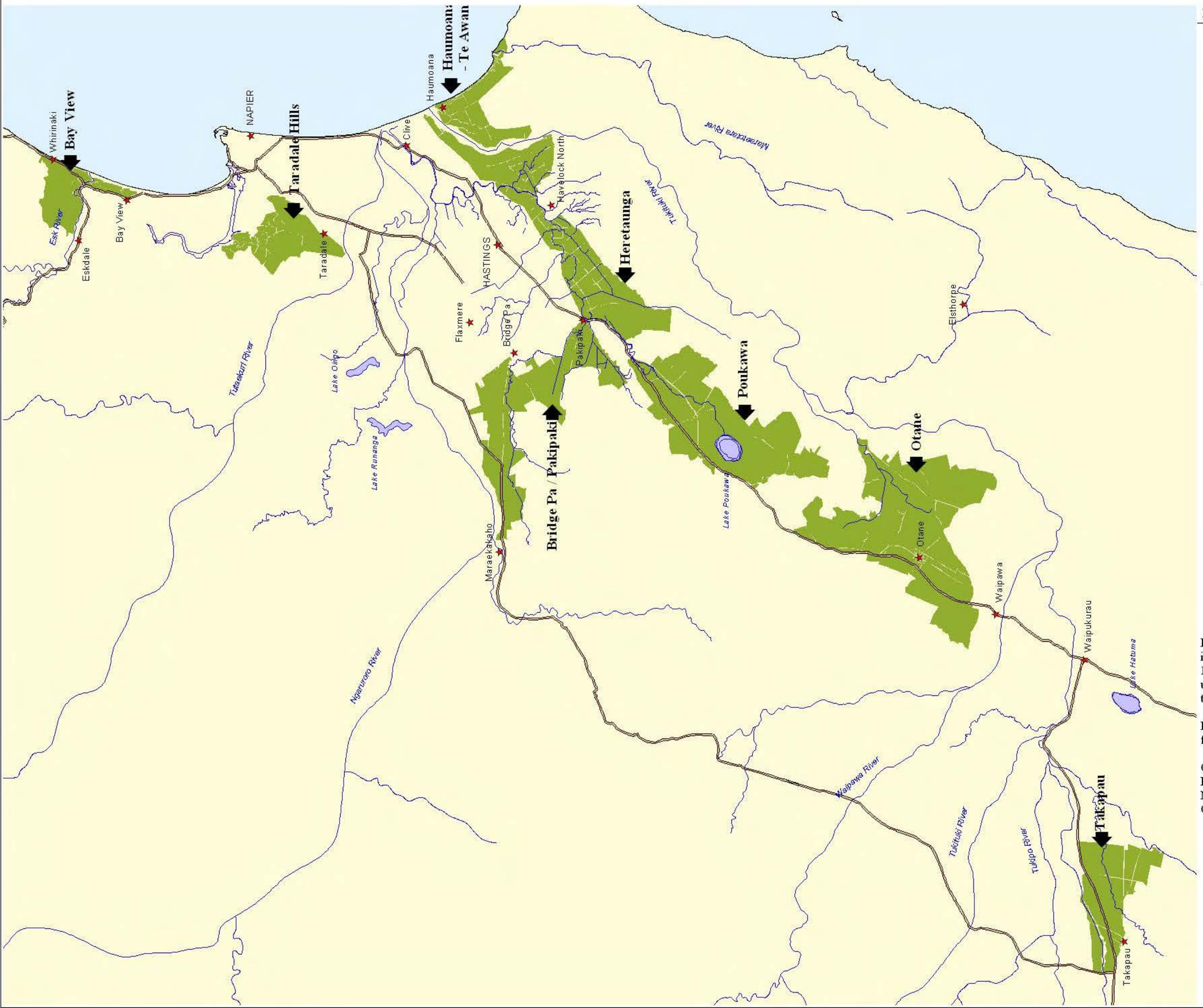
DATA FROM: DRASTIC factors obtained from the Hawke's Bay Regional Council Geographic Information System.

Cadastral Information and Digital Terrain Information obtained from Land Information New Zealand.

HAWKE'S BAY REGIONAL COUNCIL

RESOURCE MANAGEMENT PLAN

Schedule Va
Heretaunga Plains unconfined aquifer



LEGEND

- Placenames
- Railway
- Main Highways
- Rivers
- Water short areas
- Lakes

N

10 Kilometers

5 0 5

RELIABILITY: Water short area information is derived from mapping at 1:10,000 scale and should not be relied upon for measurements at scales larger than this.

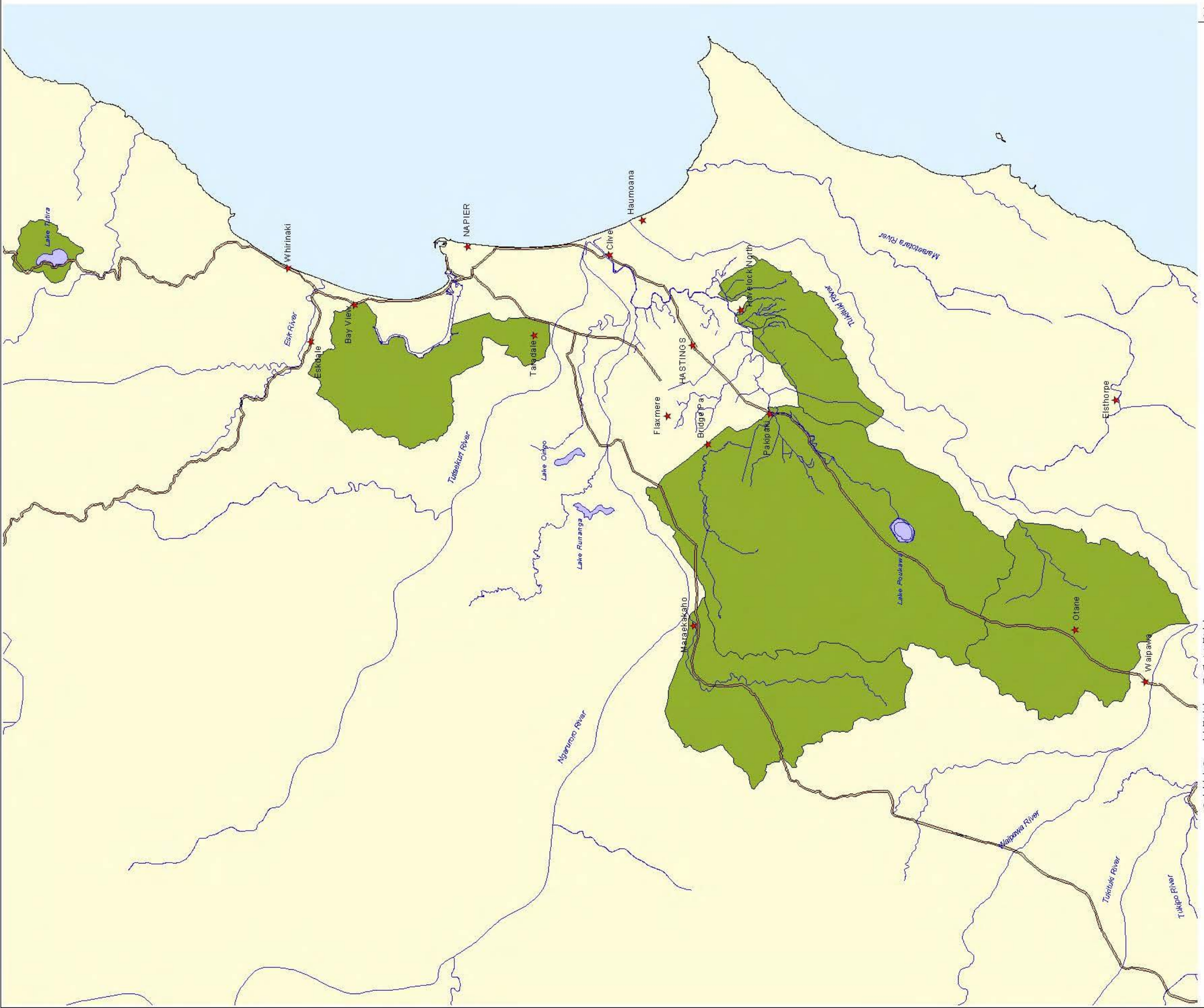
DATA FROM: Water short areas is derived from the Digital Cadastral Database (DCDB).

Cadastral Information and Digital Terrain Information obtained from Land Information New Zealand.

HAWKE'S BAY REGIONAL COUNCIL

RESOURCE MANAGEMENT PLAN

Schedule VI
Ground Water Management Zones
(Refer Policy 46 and Rule 49)



LEGEND

- Placenames
- Railway
- Main Highways
- Rivers
- Water Management Zones
- Lakes

RELIABILITY: Water management zones information is derived from mapping at 1:50,000 scale and should not be relied upon for measurements at scales larger than this.

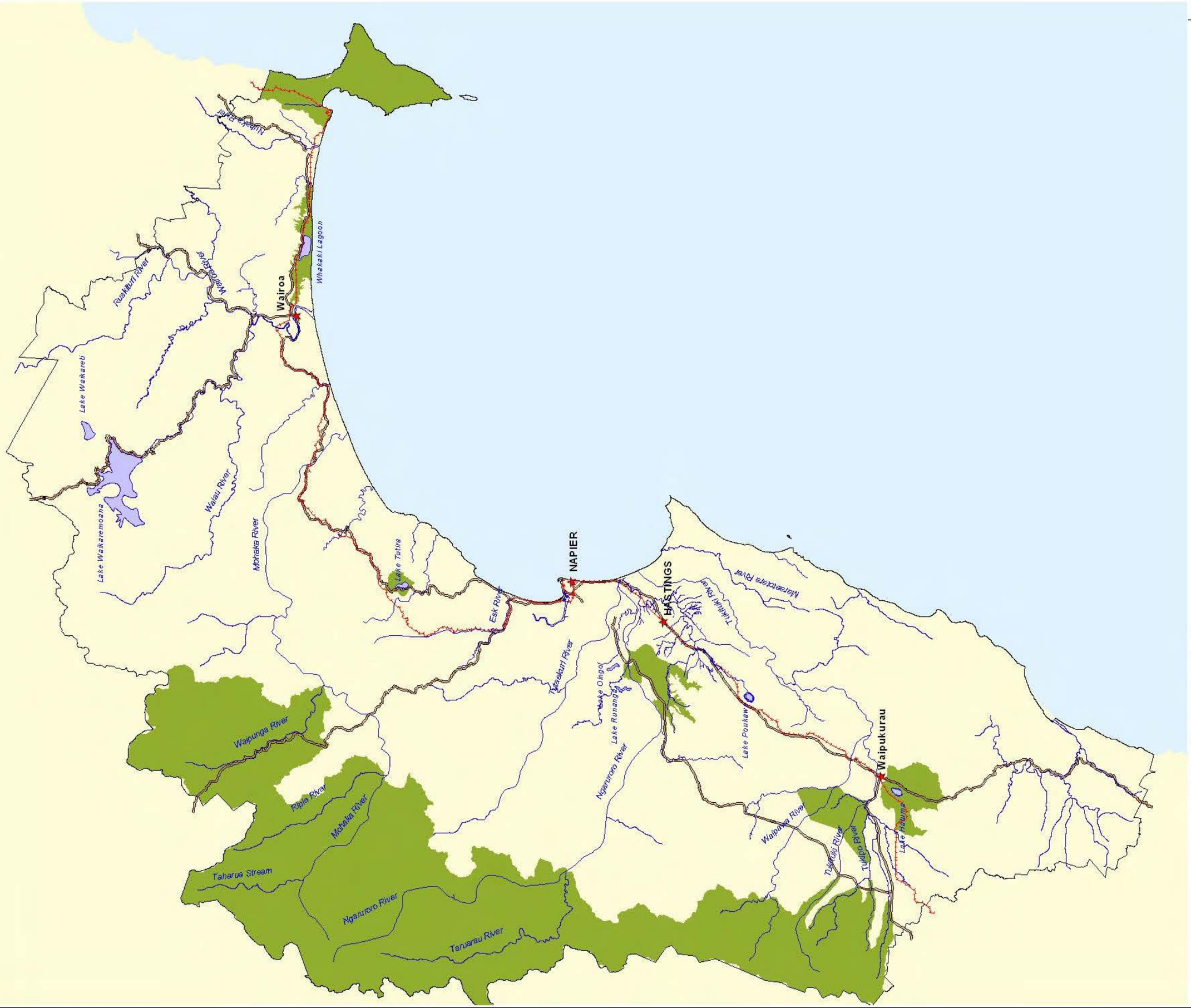
DATA FROM: Water management zones information derived from Hawke's Bay Regional Council's Catchments Database.

Cadastral Information and Digital Terrain Information obtained from Land Information New Zealand.

HAWKE'S BAY
REGIONAL COUNCIL

RESOURCE MANAGEMENT PLAN

Schedule VIa
Surface Water Management Zones
(Refer Policy 57 and Rule 50)



LEGEND

- Placenames
- Railway
- Main Highways
- Regional Roads
- Sensitive catchments

N

Kilometers

5 0 5 10

RELIABILITY: Catchment information is derived from mapping at 1:50,000 scale and should not be relied upon for measurements at scales larger than this.

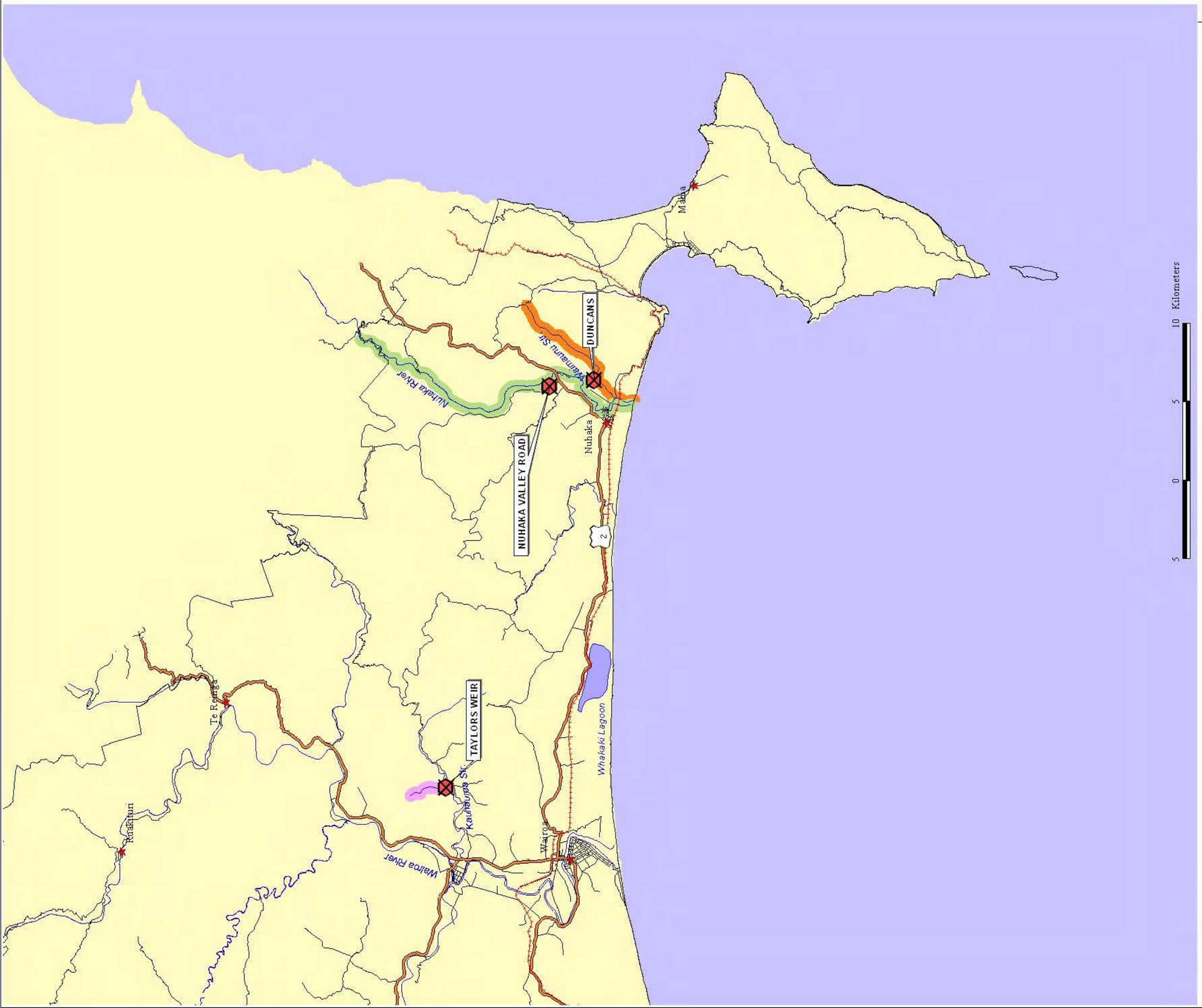
DATA FROM: Sensitivity catchment information derived from Hawke's Bay Regional Council's Catchments Database.

Cadastral Information and Digital Terrain Information obtained from Land Information New Zealand.

HAWKE'S BAY
REGIONAL COUNCIL

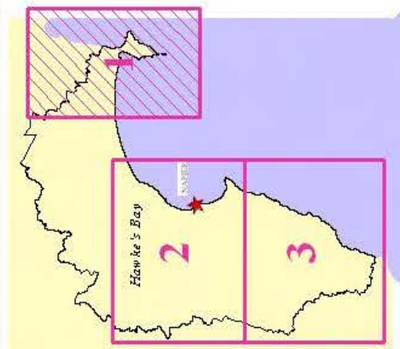
RESOURCE MANAGEMENT PLAN

Schedule VIb
Catchments sensitive to animal effluent discharges
(Refer Policy 20 and Rule 15)



LEGEND

- Placenames
- Railway
- Main Highways
- Regional Roads
- Rivers and Streams
- Stream management zones
- Minimum flow sites



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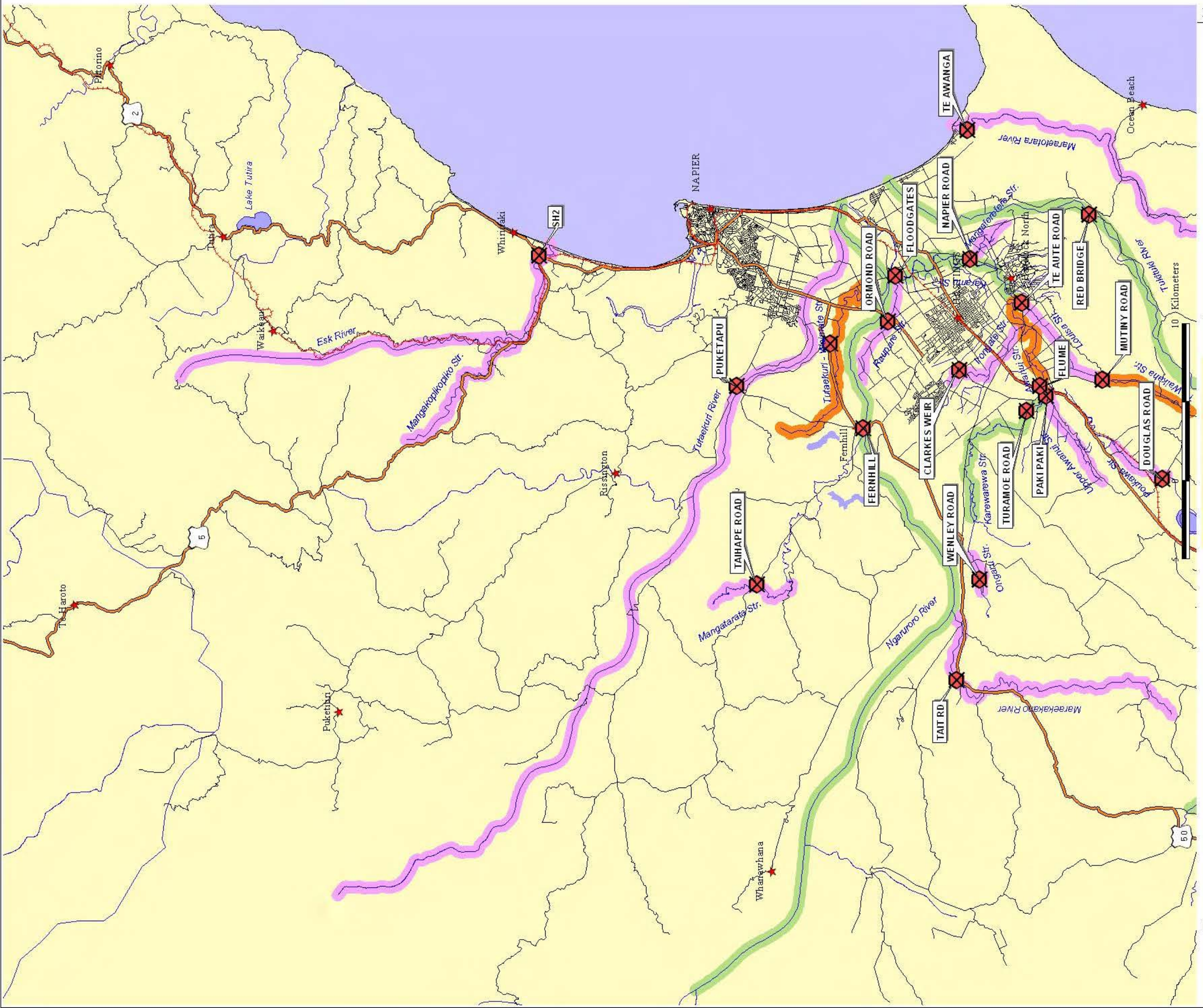
RELIABILITY: Minimum flow river information is derived from mapping at 1:250,000 scale and should not be relied upon for measurements at scales larger than this.

HAWKE'S BAY REGIONAL COUNCIL

RESOURCE MANAGEMENT PLAN

Schedule VII
Minimum Flow Rivers



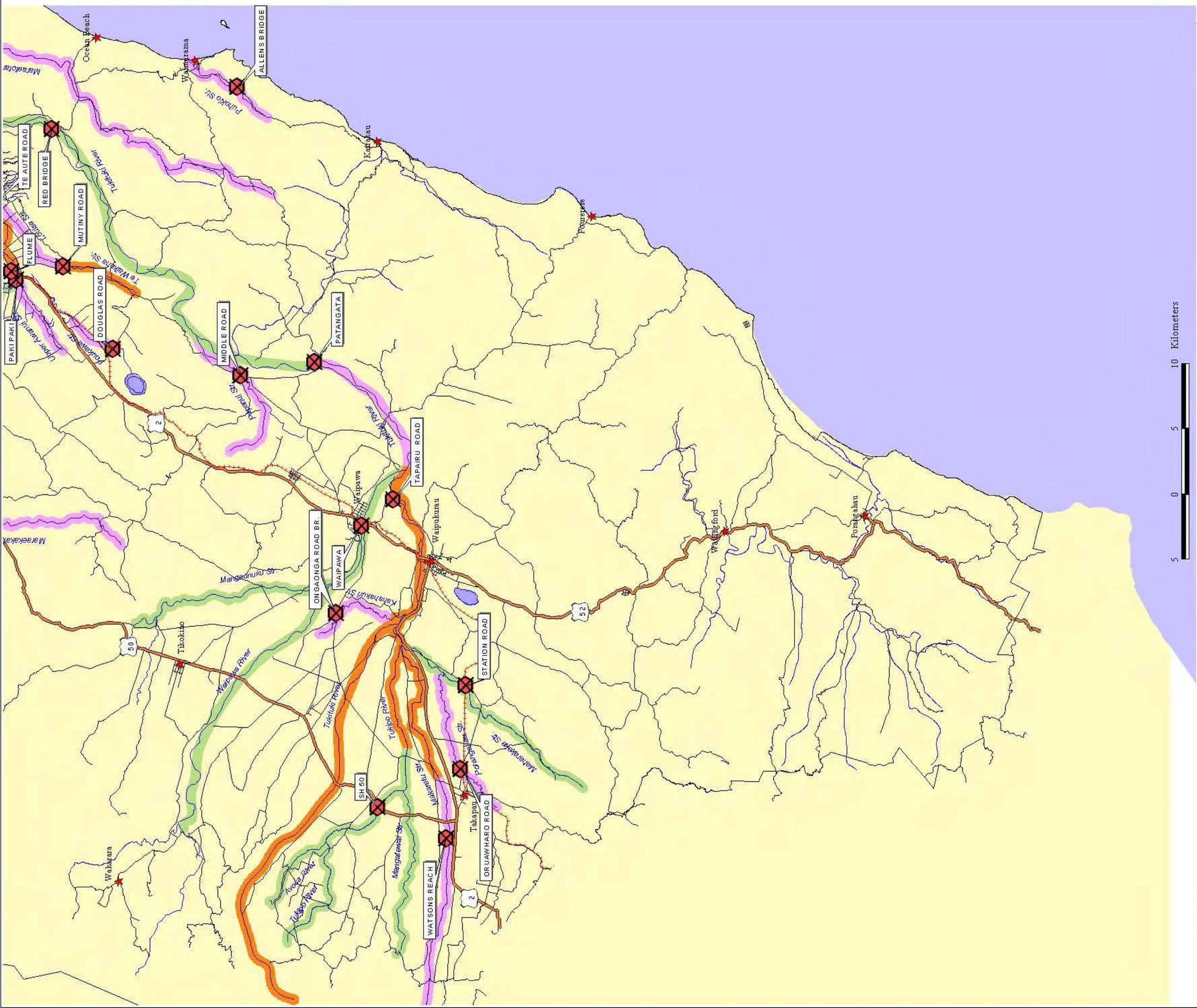
RELIABILITY: Minimum flow river information is derived from mapping at 1:250,000 scale and should not be relied upon for measurements at scales larger than this.

DATA FROM: Cadastral Information and Digital Terrain Information obtained from Land Information New Zealand. CROWN COPYRIGHT RESERVED.

HAWKE'S BAY REGIONAL COUNCIL

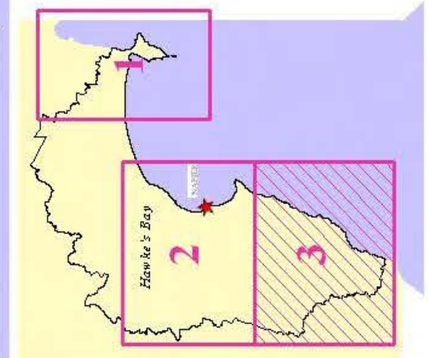
RESOURCE MANAGEMENT PLAN

Schedule VII
Minimum Flow Rivers



LEGEND

- Placenames
- Railway
- Main Highways
- Regional Roads
- Rivers and Streams
- Stream management zones
- Minimum flow sites



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RELIABILITY: Minimum flow river information is derived from mapping at 1:250,000 scale and should not be relied upon for measurements at scales larger than this.

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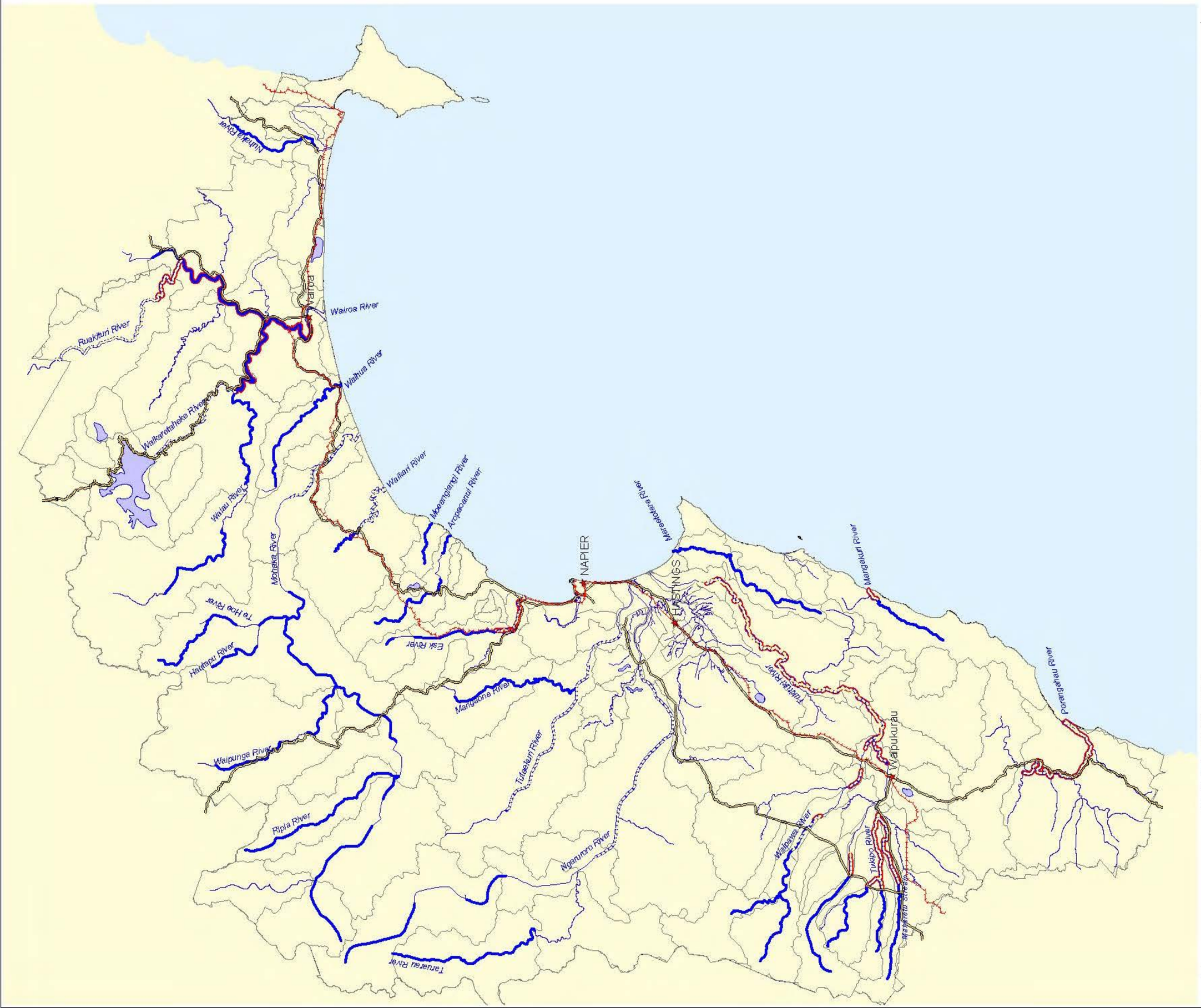
HAWKE'S BAY REGIONAL COUNCIL

RESOURCE MANAGEMENT PLAN

Schedule VII
Minimum Flow Rivers



LEGEND

- Placenames
- Railway
- Main Highways
- Rivers
- Rivers with a high use for recreation
- Rivers considered for riparian protection
- Rivers with below average water quality
- Catchment boundaries

N

Kilometers

5 0 5 10 15 20

RELIABILITY: Riparian priority protection information is derived from mapping at 1:50,000 scale and should not be relied upon for measurements at scales larger than this.

DATA FROM: Cadastral Information and Digital Terrain Information obtained from Land Information New Zealand.

HAWKE'S BAY REGIONAL COUNCIL

RESOURCE MANAGEMENT PLAN

Schedule VIII
Rivers considered for Riparian Protection which have both below average water quality and high recreational use.

Schedule IX – Chimney Design Guide and Combustion of Fuels

PART A - CHIMNEY HEIGHT REQUIREMENTS

IXA-1 CHIMNEY HEIGHT REQUIREMENTS – FOR DISCHARGE FROM THE EXTERNAL COMBUSTION OF NATURAL OR LIQUEFIED PETROLEUM GAS [1]

METHODOLOGY

1.1 In terrain where the land does not rise to more than half, and buildings do not rise to more than 0.4 times, the indicative height of the chimney within a ground distance of five times the indicative height, and where there are no other significant sources or air-borne contaminants, the height of any chimney discharging the products of combustion from fuel burning equipment will be determined generally in accordance with the following guidelines:

(a) For any discharge from the combustion of natural gas or liquefied gas where the release of nitrogen oxides is less than 0.5 kg/h or the rate of heat release is less than 2 MW: The minimum chimney height should be the higher of either 8 m above finished ground level or 3 m above the highest substantial part of any building located within 40 m of the chimney, or any part of the building to which the chimney may be attached.

(b) For any discharge from the combustion of natural gas or liquefied gas where the release of nitrogen oxides is equal to or exceeds 0.5 kg/h but is less than 20 kg/h and the rate of heat release is less than 50 MW: The height of the chimney should be calculated in accordance with Table i (with the minimum height being whichever is the greater height of those corresponding to the heat input (MW) and the nitrogen oxides discharge (kg/h)), or be 3.3 m above the highest substantial part of any building located within 40 m of the chimney, or any part of the building to which the chimney may be attached, whichever is the higher.

Table i. Natural gas or liquefied gas used as a fuel

Heat input (MW)	Nitrogen oxides (kg/h)	Chimney height above ground (m)
2	0.5	8.3
2.5	0.6	8.5
3.0	0.8	8.7
4.0	1.1	9.1
5.0	1.7	9.4
6.0	1.7	9.7
7.0	2.0	10.0
8.0	2.4	10.3
9.0	2.7	10.6
10.0	3.0	10.8
11.0	3.4	11.0
12.0	3.7	11.3
13.0	4.1	11.5
14.0	4.5	11.7
15.0	4.8	11.9
16.0	5.2	12.1
17.0	5.6	12.3
18.0	5.9	12.5

[1] These criteria only apply to permitted and controlled activities. This includes large scale fuel burning appliances with combined heat outputs of less than 50MW for natural gas and liquefied petroleum gas. Discretionary activities require a site specific evaluation which takes into account the impact of the chimney height on ground level concentrations of contaminants as a part of the resource consent application.

Heat input (MW)	Nitrogen oxides (kg/h)	Chimney height above ground (m)
19.0	6.3	12.7
20.0	6.7	12.8
25.0	8.6	13.7
30.0	10.6	14.5
35.0	12.7	15.2
40.0	16.9	16.4
45.0	16.9	16.4
50.0	19	17.0

1.2 In the following circumstances, the height of the chimney should generally be determined so that the discharge will not give rise to sulphur dioxide and nitrogen oxides levels in excess of an indicator level based on 40% of the 'New Zealand Ambient Air Quality Guidelines' (Ministry for the Environment, 2002), using the 99.9% modelled percentile:

(a) In terrain where the land rises to more than half, or buildings rise to more than 0.4 times, the indicative height of the chimney, within a ground distance of five times the indicative height.

IXA-2 CHIMNEY HEIGHT REQUIREMENTS – FOR DISCHARGE FROM THE EXTERNAL COMBUSTION OF KEROSENE, DIESEL, COAL, HEAVY FUEL OIL, LIGHT FUEL OIL, UNTREATED WOOD OR PELLET FUEL[2].

1.3 In relation to any large scale fuel burning appliance burning diesel, kerosene, coal, heavy fuel oil, light fuel oil, untreated wood, or pellet fuel, discharges into air from external combustion after the notification date of Plan Change 2[3], must be via an emission stack where:

(a) the discharge point is at least 12.5 metres above ground level, or

(b) the discharge point is 2.5 metres higher than the apex of any building, tree, slope or other structure within a horizontal radius of 2.5 times the stack height (whichever discharge point a) or b) is the higher), and

(c) the exhaust gases are directed vertically into air and are not impeded by any obstruction that would lower the velocity of the exhaust gases.

Explanatory Note

1.4 To ensure that the plume released from the stack is not affected by building downwash effects, therefore creating high ground level concentrations, the stack must be at least 2.5 metres higher than the tallest building or obstacle within the vicinity of the stack (meaning within a circle drawn around the stack with a radius 2.5 times the height of the stack). For example, in a building that has a stack 10 metres high relative to ground level, there would be a 25 metre radius drawn around the stack for potential downwash effects. The discharge point would have to be 2.5 metres higher than any obstacle within this circle in order to achieve good dispersion of emissions from the stack.

[2] These criteria only apply to permitted and controlled activities. This includes large scale fuel burning appliances with combined heat outputs of less than 100 kW for coal, heavy fuel oil, light fuel oil and untreated wood, less than 5MW for diesel, less than 2 MW for kerosene, and less than 600 kW for wood pellet fuel being burned in modified pellet boilers, and less than 1.2 MW for wood pellet fuel being burned in custom designed boilers. Discretionary activities require a site specific evaluation which takes into account the impact of the chimney height on ground level concentrations of contaminants as a part of the resource consent application.

[3] 10 December 2008

IXA-3 EXPLANATION

1.5 The combustion of any fuel will generate airborne contaminants. The most accepted method of managing discharges of these contaminants is by remaining within desired maximum ground level concentrations. The 'New Zealand Ambient Air Quality' Guidelines (Ministry for the Environment, 2002) set out the desired maximum ground level concentrations for pollutants, and the Resource Management (National Environmental Standards for Air Quality) Regulations 2004 set out ambient air quality standards that maximum ground level concentrations must remain within. To give effect to these standards and guidelines, it is necessary to have a chimney of sufficient height to disperse contaminants effectively by diluting the combustion gases to a level where the adverse effects are no more than minor.

1.6 In flat terrain and in the absence of high buildings, simple formulae (e.g. Table i) can be used to calculate the height of the chimney required for various fuels. If these guidelines cannot be met the Council will have the ability to apply more general guidelines when determining adequate heights for chimneys, or if considered necessary require modelling to be carried out.

Part B – Emissions from Combustion

IXB-1 INTRODUCTION

1.7 The rules in this Plan regulate the discharge of contaminants into air from combustion processes. For ease of implementation, the rules regulate heat release rates rather than emission rates of contaminants. However, it is important to consider what contaminants are emitted from combustion processes. This Schedule provides guidance on the nature of emissions that can be expected from the combustion processes regulated by the rules in this Plan.

1.8 Emission rates can vary enormously, depending on fuel specification/composition, fuel quality, process of combustion, load, equipment age and technical sophistication maintenance and operating practice, use of control systems and filters, and ambient conditions (temperature and humidity of feed air). It is very difficult to assign a particular emission to a particular activity, and the only way to determine this properly is by measurement. Table iii in this Schedule shows a Worst case, a Typical case, and a Best case.

IXB-2 FUEL USE

1.9 A first step in estimating emissions is to estimate the fuel used in the various processes (shown in Table iii). Assuming continuous operation of a process for one year, the fuel used can be calculated as follows:

$$\text{Annual fuel consumption (kg/y)} = \frac{\text{Process size (J/s)}}{\text{Fuel calorific value (J/kg)}} \times 3.1536 \times 10^{7}\ \text{s/y}$$

where:

- Fuel calorific value is the energy released per unit fuel:

Natural Gas	36 MJ/m^3
LPG	46 MJ/kg
Oil	41 MJ/kg
Coal	25 MJ/kg
Wood	10 MJ/kg

- 3.1536×10^{7} s/y is the factor needed to scale the process to one year.

Table ii. Typical fuel use for combustion processes

Process	Size	Fuel use per Year	Rate per MW
Natural gas	5 MW 50 MW	4,400,000 m^3 44,000,000 m^3	880,000 m^3
LPG	5 MW 50 MW	3,400 tonnes 34,000 tonnes	680 tonnes
Oil	40 kW 10 MW	31 tonnes 7,700 tonnes	770 tonnes
Coal	40 kW 10 MW	50 tonnes 12,600 tonnes	1,300 tonnes
Wood	40 kW 10 MW	130 tonnes 31,500 tonnes	3,200 tonnes

IXB-2 KEY CONTAMINANTS

1.10 The key contaminants from combustion processes are as follows:

PM_{10} The fraction of particulate matter in the air of size less than 10 micrometres.
24 hour standard: 50 $\mu g/m^3$.
Annual guideline : 20 $\mu g/m^3$.

CO Carbon monoxide.
8 hour standard: 10 mg/m^3.
1 hour guideline: 30 mg/m^3.

NO_x Oxides of nitrogen, mainly NO, NO_2 and small amounts of NO_3.
Standards and Guidelines for NO_2 only:
24 hour standard: 100 $\mu g/m^3$.
1 hour guideline: 200 $\mu g/m^3$.

SO_x Oxides of sulphur, mostly SO_2.
Standards and Guidelines for SO_2 only:
24 hour guideline: 120 $\mu g/m^3$.
1 hour standard: 350 $\mu g/m^3$.
1 hour standard 570 $\mu g/m^3$ (no exceedences)

O_3 Ozone
1 hour standard: 150 $\mu g/m^3$.
8 hour guideline: 100 $\mu g/m^3$.

VOC Volatile organic compounds, usually light hydrocarbons, sometimes with small amounts of hazardous contaminants. Guideline levels for these are currently under review.

IXB-3 CALCULATION DETAILS & EMISSION RATES

1.11 Taking the fuel consumption data (from Table ii) and standard emissions factors from the literature (USEPA (AP-42), WHO, IPCC or the Air Pollution Engineering Manual – see "Bibliography") for each of the key contaminants, the annual emissions can then be calculated according to:

Annual emissions = Annual fuel consumption x Standard emission factor

1.12 The resultant emissions are reported in Table iii for three cases - worst, typical and best - based on the following assumptions:

- Sulphur content of coal = 1.0% by weight (range 0.4 to 2.0).
- Ash content of coal = 4.0% by weight (range 3.0 to 5.0).
- Density of LPG = 0.5 kg/l.
- Density of fuel oil = 0.845 kg/l.

1.13 The ranges given are subjective estimates. At the extremes, it may be possible to find either very poorly operated equipment, or conversely highly efficient equipment that may lie outside these limits.

Table iii. Typical Emission Rates for Combustion Processes

PROCESS	SIZE	EMISSION RATE BY CONTAMINANT				
		PM_{10} (kg/y)	CO (kg/y)	NO_x (kg/y)	SO_x (kg/y)	VOC (kg/y)
Gas/LPG	5MW worst	870	4,300	10,000	42	790
	5MW typical	370	2,400	5,700	33	440
	5MW best	210	1,400	2,500	24	180
	50MW worst	6,700	81,000	390,000	420	29,000
	50MW typical	2,100	28,000	200,000	330	4,000
	50MW best	700	25,000	37,000	240	1,300
Oil	40kW worst	22	22	260	120	12
	40kW typical	9	20	86	120	6
	40kW best	2	19	22	9	1
	10MW worst	5,400	5,500	65,000	31,000	3,100
	10MW typical	2,200	4,900	21,000	31,000	1,400
	10MW best	540	4,700	5,400	2,300	310
Coal	40kW worst	350	280	930	2,000	53
	40kW typical	250	120	410	880	3
	40kW best	25	15	170	400	3
	10MW worst	88,000	110,000	270,000	490,000	13,000
	10MW typical	63,000	32,000	110,000	220,000	760
	10MW best	6,300	3,200	81,000	81,000	630
Wood	40kW worst	440	1,400	180	13	110
	40kW typical	160	250	42	5	19
	40kW best	10	38	42	1	11
	10MW worst	110,000	760,000	57,000	3,200	27,000
	10MW typical	41,000	410,000	36,000	1,200	4,700
	10MW best	2,500	63,000	950	160	2,800

IXB-4 BIBLIOGRAPHY

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Ministry for the Environment, Ministry of Heath (2002) Ambient Air Quality Guidelines 2002 update.

Schedule X – Air Quality Guidelines 2002

(and comparison with guideline values 1994)

CONTAMINANT	1994 GUIDELINE VALUES		2002 GUIDELINE VALUES	
	Value	Averaging time	Value	Averaging time
Carbon Monoxide	30 mg/m^3 10 mg/m^3	1 hour 8 hour	30 mg/m^3 10 mg/m^3	1 hour 8 hour
Particles: **PM_{10}**	120 µg/m^3 40 µg/m^3	24 hour Annual	50 µg/m^3 20 µg/m^3	24 hour Annual
Nitrogen dioxide	300 µg/m^3 100 µg/m^3	1 hour 24 hour	200 µg/m^3 100 µg/m^3	1 hour 24 hour
Sulphur dioxide [2]	500 µg/m^3 350 µg/m^3 125 µg/m^3 50 µg/m^3	10 min 1 hour 24 hour Annual	Withdrawn 350 µg/m^3 120 µg/m^3 Withdrawn	 1 hour 24 hour
Ozone	150 µg/m^3 100 µg/m^3	1 hour 8 hour	150 µg/m^3 100 µg/m^3	1 hour 8 hour
Hydrogen sulphide	7 µg/m^3	30 min	7 µg/m^3	1 hour
Lead [3]	0.5 -1.0 µg/m^3	3 month	0.2 µg/m^3 (lead content of PM10)	3-month moving average (calculated monthly)

Notes

1. The sulphur dioxide guideline values do not apply to sulphur acid mist.
2. The guideline values for metals are for inhalation exposure only; they do not include exposure from other routes. These other routes should be considered in assessments.

Ambient Air Quality Standards 2004 – Resource Management (National Environmental Standards for Air Quality) Regulations 2004

Contaminant	Standard	Time Average	Allowable exceedences per year
Carbon monoxide (CO)	10 mg/m^3	8 hours	1
Nitrogen dioxide (NO_2)	200 µg/m^3	1 hour	9
Ozone (O_3)	150 µg/m^3	1 hour	0
Particles (PM_{10})	50 µg/m^3	24 hours	1
Sulphur dioxide (SO_2)	350 µg/m^3	1 hour	9
	570 µg/m^3	1 hour	0

Schedule XI. Performance requirements for qualifications to apply agrichemicals

The following are the training requirements for permitted activity conditions in Rule 10. Widespread application of agrichemicals.

COMMERCIAL USER

The minimum training programme for applicators of agrichemicals shall include:

Knowing and being able to describe:

(a) The hazard classifications of agrichemicals to be used.
(b) The adverse effects that could be caused by the agrichemicals to be used.
(c) His or her obligations and liabilities under Acts of Parliament relative to the agrichemicals to be used and their use.
(d) Which regulations apply in respect of those agrichemicals, and where those regulations can be obtained (including the local regional air quality plan).
(e) The content of NZS 8409: 2004 Management of Agrichemicals.
(f) The precautions required to prevent injury to a person or damage to the environment (including property) by any agrichemicals to be used.
(g) The procedure to adopt in an emergency involving the agrichemicals to be used.

Knowing and being able to demonstrate:

(h) A working knowledge of the operating equipment (including protective equipment and clothing) necessary to manage the agrichemicals being used.

An example of a qualification that meets these requirements is the GROWSAFE® Introductory Certificate.

CONTRACTOR EMPLOYEE

The minimum programme for contract use of agrichemicals (animal and plant health products) where agrichemicals are applied for hire or reward (both ground and aerial application) shall include those matters listed for commercial users and these additional matters:

- First aid, health and safety, and emergency response.
- Environmental effects, including spray drift minimization.
- Notification requirements, including signage.
- Product label interpretation.
- Protective equipment selection and use.
- Transport, storage and disposal of agrichemicals.
- Selection, calibration and operation of application equipment for specific operations.

An example of a qualification that meets these requirements is the GROWSAFE® Applied Certificate.

Schedule XII – Emission Requirements: Small scale solid fuel burners

PART A SMALL SCALE SOLID FUEL BURNERS - AIRZONE 1 - HASTINGS AIRSHED

A-1 SOLID FUEL BURNER REQUIREMENTS (FREE STANDING BURNERS, NEW BURNERS[3] (WITH OR WITHOUT A WETBACK) & INSERT BURNERS (WITHOUT A WETBACK)

A-1.1 a small scale solid-fuel burner must:

a) emit no more than 1.0 gram of total suspended particulate matter per kilogram of fuel burned, calculated by averaging the total suspended particulate emissions for high, medium and low burn rates, when tested in accordance with AS/NZS4012:1999 and AS/NZS4013:1999, or AS/NZS4014.6.2007, AS/NZS4886.2007 and AS/NZS5078:2007 when testing pellet burners, or the functional equivalent for other non batch-fed appliances. Where the nominated test fuel is wood then the test shall be carried out using softwood in accordance with the requirements of AS/NZS 4014.2:1999

b) have a thermal efficiency, for space heating only, as described in AS/NZS4013:1999, of 65% or greater

c) comply with the definition of 'NESAQ compliant burner' in this Plan

d) not be modified in any way so as to alter the specifications of the burner from those tested and stated by the manufacturer

e) be maintained in good operational order and operated in accordance with the manufacturer's instructions and

f) be capable of being operated on a high, medium and low burn rate.

A-2 SOLID FUEL BURNER REQUIREMENTS (INSERT BURNERS WITH A WETBACK)

A-2.1 a small scale solid-fuel burner must:

a) emit no more than 1.5 grams of total suspended particulate matter per kilogram of fuel burned, calculated by averaging the total suspended particulate emissions for high, medium and low burn rates, when tested in accordance with AS/NZS4012:1999 and AS/NZS4013:1999, or AS/NZS4014.6.2007, AS/NZS4886.2007 and AS/NZS5078:2007 when testing pellet burners, or the functional equivalent for other non batch-fed appliances. Where the nominated test fuel is wood then the test shall be carried out using softwood in accordance with the requirements of AS/NZS 4014.2:1999

b) have a thermal efficiency, for space heating only, as described in AS/NZS4013:1999, of 65% or greater

c) comply with the definition of 'NESAQ compliant burner' in this Plan

d) not be modified in any way so as to alter the specifications of the burner from those tested and stated by the manufacturer

e) be maintained in good operational order and operated in accordance with the manufacturer's instructions

f) be capable of being operated on a high, medium and low burn rate, and

g) be connected to the hot water supply system within a residential dwelling.

PART B SMALL SCALE SOLID FUEL BURNERS - AIRZONES 1 & 2 - NAPIER AIRSHED AND AIRZONE 2 - HASTINGS AIRSHED

B-1 SOLID FUEL BURNER REQUIREMENTS

B-1.1 a small scale solid-fuel burner must:

a) emit no more than 1.5 grams of total suspended particulate matter per kilogram of fuel burned, calculated by averaging the total suspended particulate emissions for high, medium and low burn rates, when tested in accordance with AS/NZS4012:1999 and AS/NZS4013:1999, or AS/NZS4014.6.2007, AS/NZS4886.2007 and AS/NZS5078:2007 when testing pellet burners, or the functional equivalent for other non batch-fed appliances. Where the nominated test fuel is wood then the test shall be carried out using softwood in accordance with the requirements of AS/NZS 4014.2:1999

b) have a thermal efficiency, for space heating only, as described in AS/NZS4013:1999 of 65% or greater

c) comply with the definition of 'NESAQ compliant burner' in this Plan

d) not be modified in any way so as to alter the specifications of the burner from those tested and stated by the manufacturer

e) be maintained in good operational order and operated in accordance with the manufacturer's instructions and

f) be capable of being operated on a high, medium and low burn rate.

[3] A new burner is classed as a burner not replacing an existing burner located within the same building.

PART C SMALL SCALE SOLID FUEL BURNERS - NAPIER AIRSHED AND HASTINGS AIRSHED

C-1 MODIFIED SOLID FUEL BURNER & INFORMATION REQUIREMENTS

C-1.1 the modified small scale solid-fuel burner must:

a) emit no more than 1.5 grams of total suspended particulate matter per kilogram of fuel burned, calculated by averaging the total suspended particulate emissions for high, medium and low burn rates, when tested in accordance with AS/NZS4012:1999 and AS/NZS4013:1999, or AS/NZS4014.6.2007, AS/NZS4886.2007 and AS/NZS5078:2007 when testing pellet burners, or the functional equivalent for other non batch-fed appliances. Where the nominated test fuel is wood then the test shall be carried out using softwood in accordance with the requirements of AS/NZS 4014.2:1999

b) have a thermal efficiency, for space heating only, as described in AS/NZS4013:1999 of 65% or greater

c) comply with the definition of 'modified NESAQ compliant burner' in this Plan

d) be maintained in good operational order and operated in accordance with the manufacturer's instructions and

e) be capable of being operated on a high, medium and low burn rate.

C-1.2 all modifications shall be undertaken by an independent suitably qualified person[4] approved by the burner manufacturer and notified to the Hawke's Bay Regional Council.

C-1.3 the following information shall be provided to the Hawke's Bay Regional Council prior to the modification taking place:

a. name, address and phone number of property owner

b. description of the type of device, year of manufacture and installation, and tested particulate emission rates for that device at the time of installation (if available)

c. a description of the modifications that need to take place to make the existing burner NESAQ compliant

d. confirmation by the burner manufacturer or their agent that the existing burner is in good working order, and complies with the technical specifications of the particular NESAQ compliant burner model, or provision of a list of remedial work necessary to make it NESAQ compliant, and/or to restore the burner to good working order

e. technical specifications of the old appliance and the equivalent NESAQ authorised appliance, and confirmation by the burner manufacturer that the technical specifications and overall dimensions of both burners, after modification are the same.

f. a list of measures that can be undertaken to ensure the existing burner cannot be easily tampered with after the modification has occurred.

C-1.4 the following information must be provided to the Hawke's Bay Regional Council after the modification has occurred:

a. confirmation by the burner manufacturer that the technical specifications of the existing burner and the equivalent NESAQ compliant burner, after modification are the same

b. confirmation by the burner manufacturer that the list of remedial work identified in condition C-1.3(d) above (if any), has been undertaken

c. name and phone number of the approved 'independent suitably qualified person' who carried out the modification.

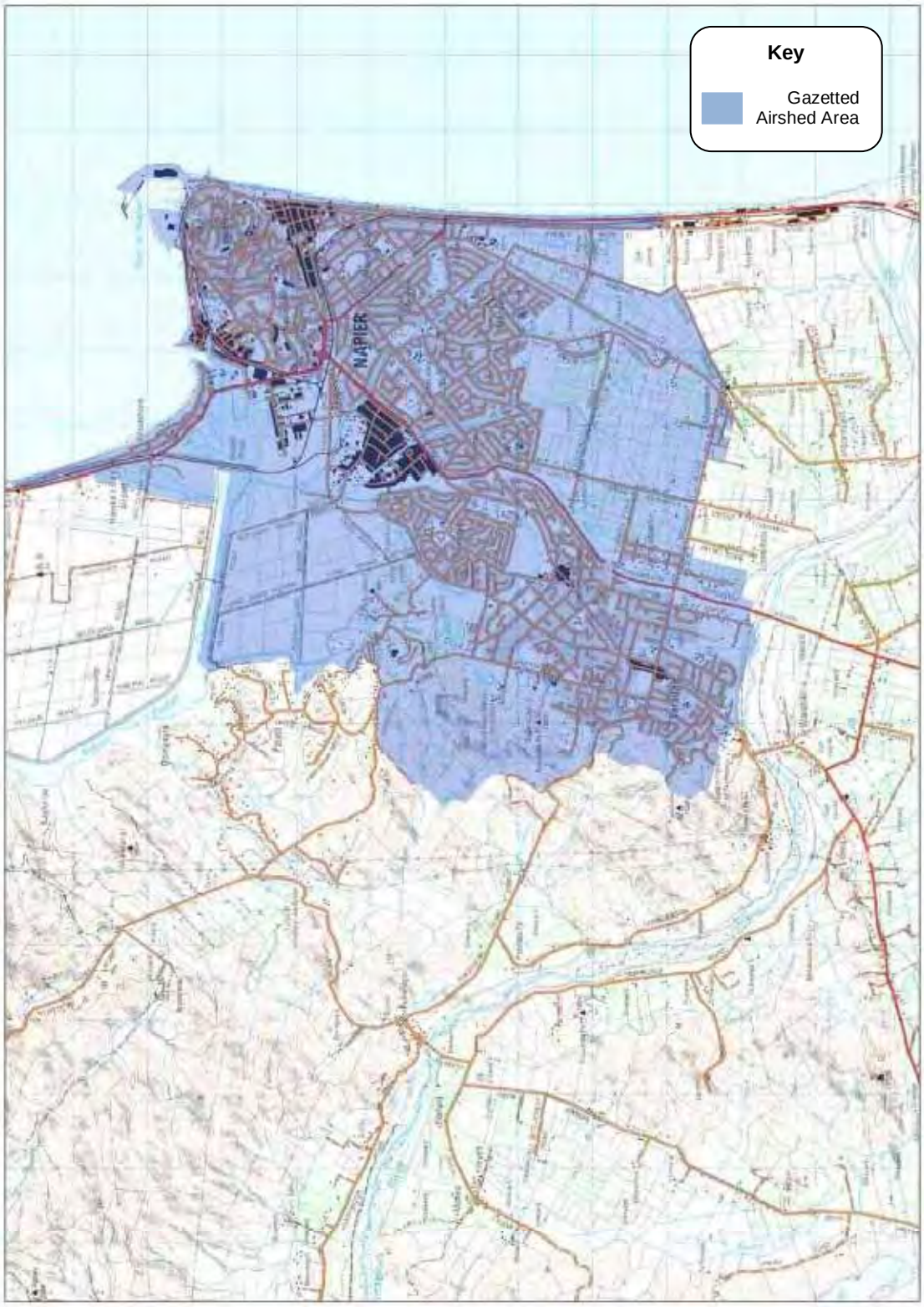
d. Confirmation that the list of measures referred to in C-1.3(f) above have been carried out.

C-1.5 the Hawke's Bay Regional Council may require information provided in accordance with C-1.3 above to be technically peer reviewed.

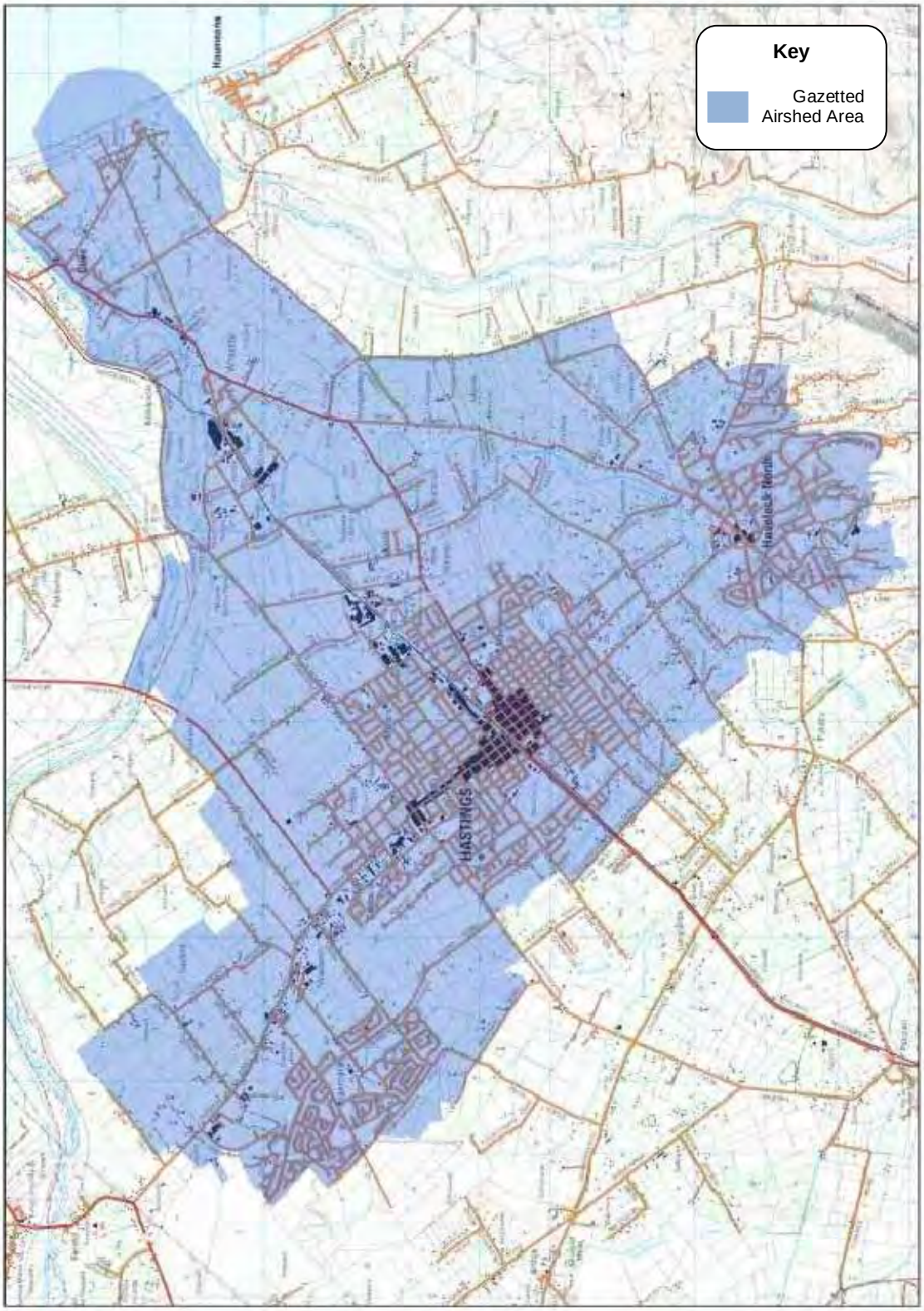
[4] An independent suitably qualified person is deemed to include the manufacturer of the burner, or a nominated representative of the manufacturer, or staff employed by the manufacturer.

Schedule XIII – Airshed boundaries and Airzone boundaries

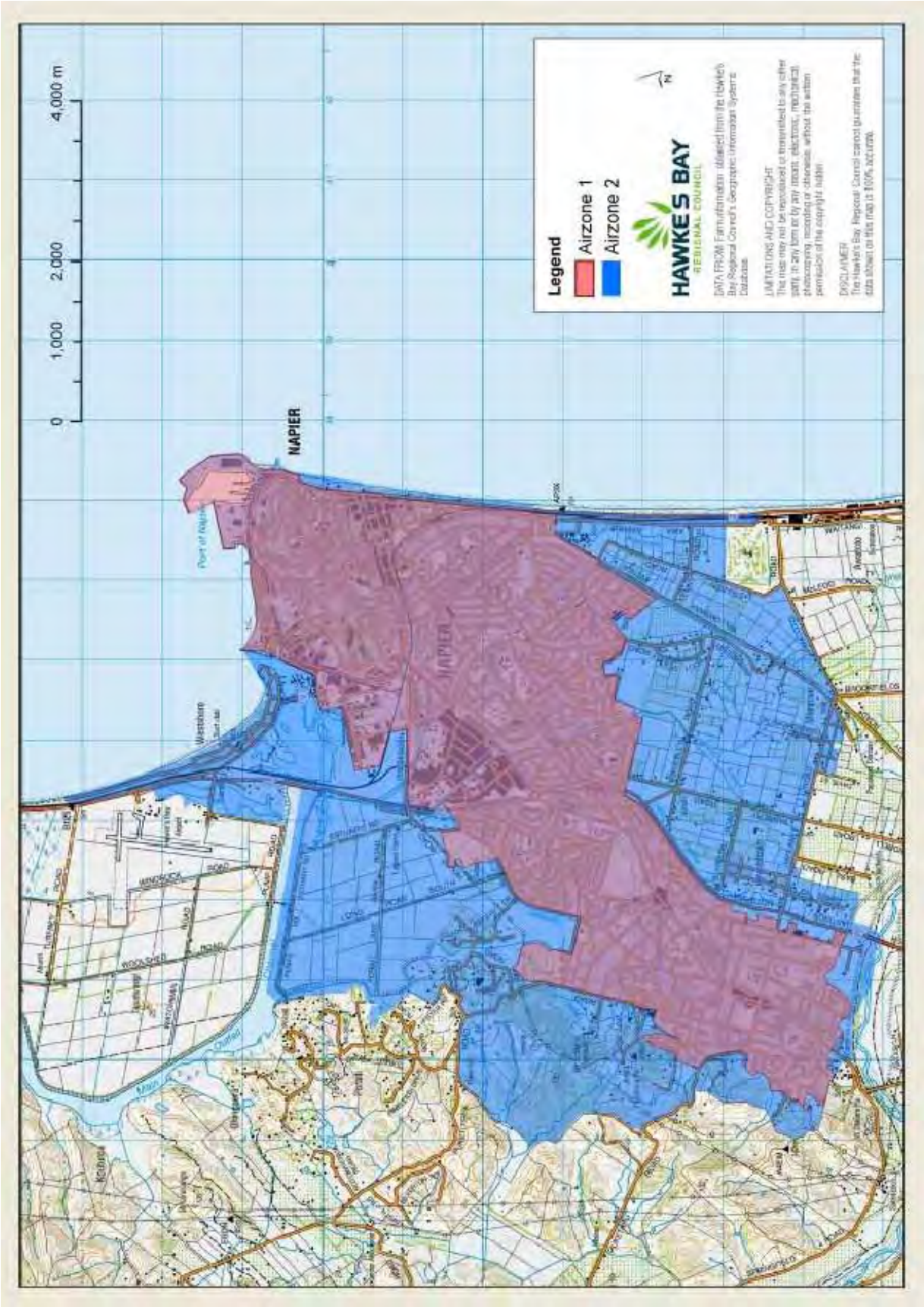
Napier Airshed



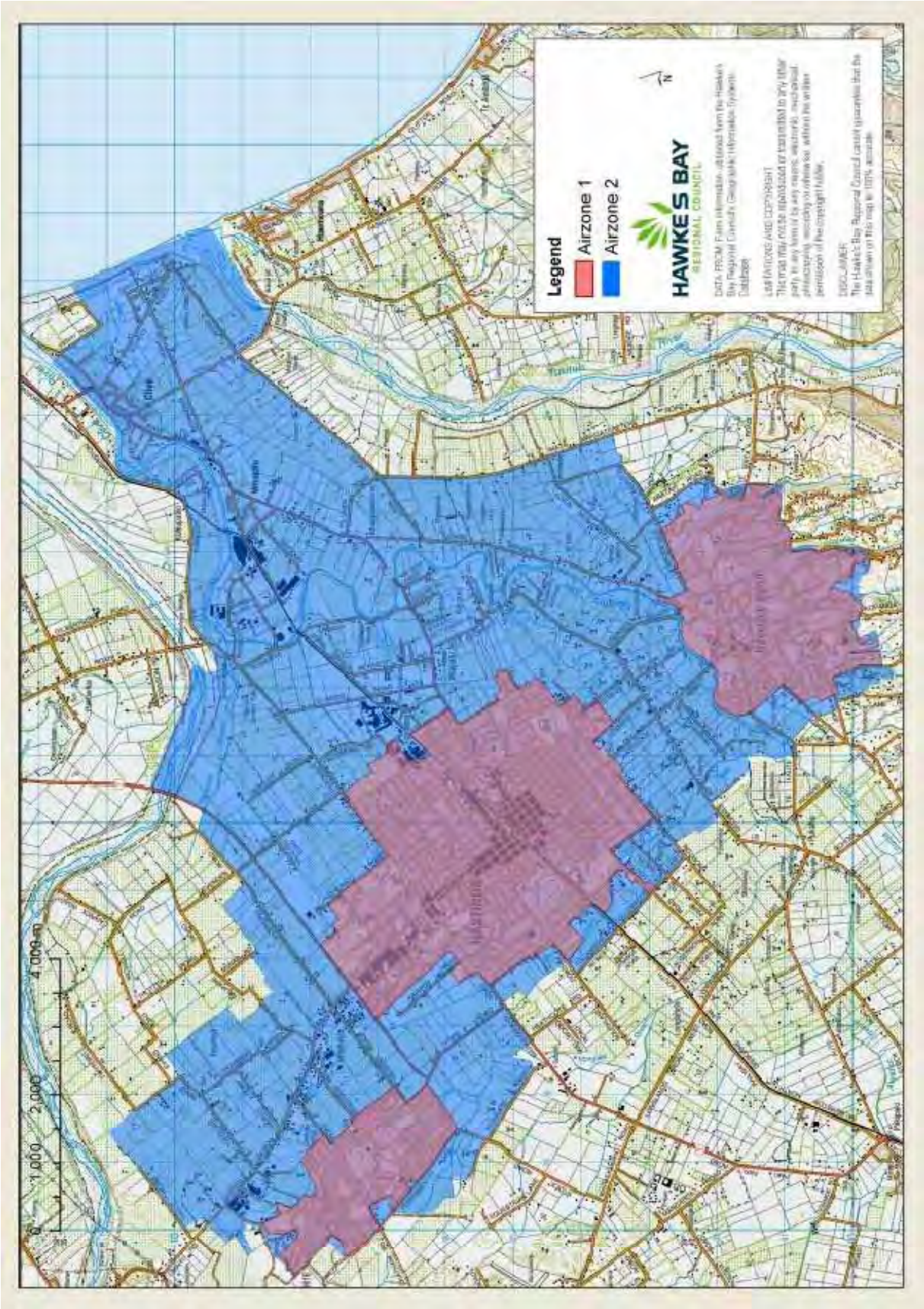
Hastings Airshed



Napier Airshed: Airzone Boundaries

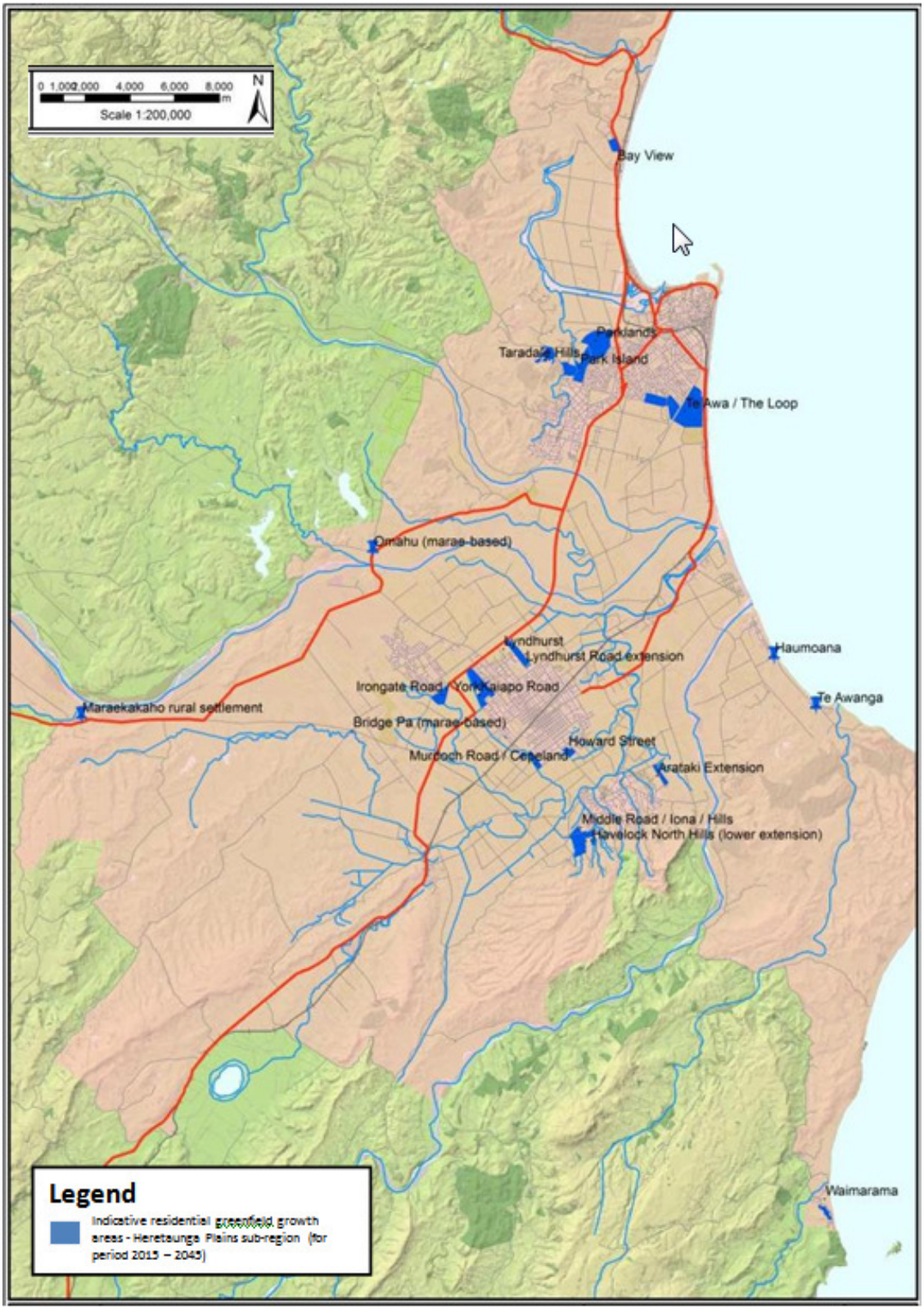


Hastings Airshed: Airzone Boundaries

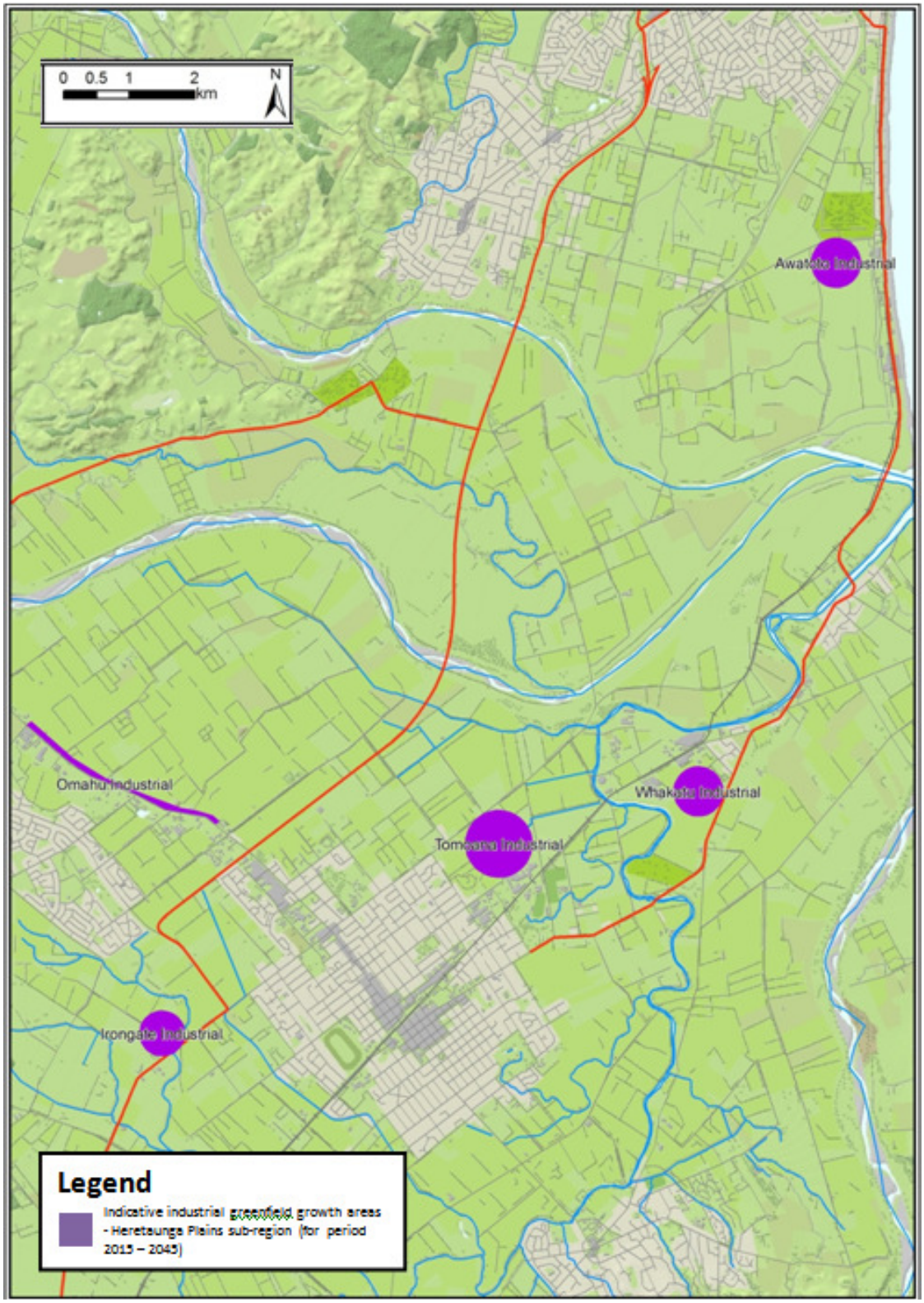


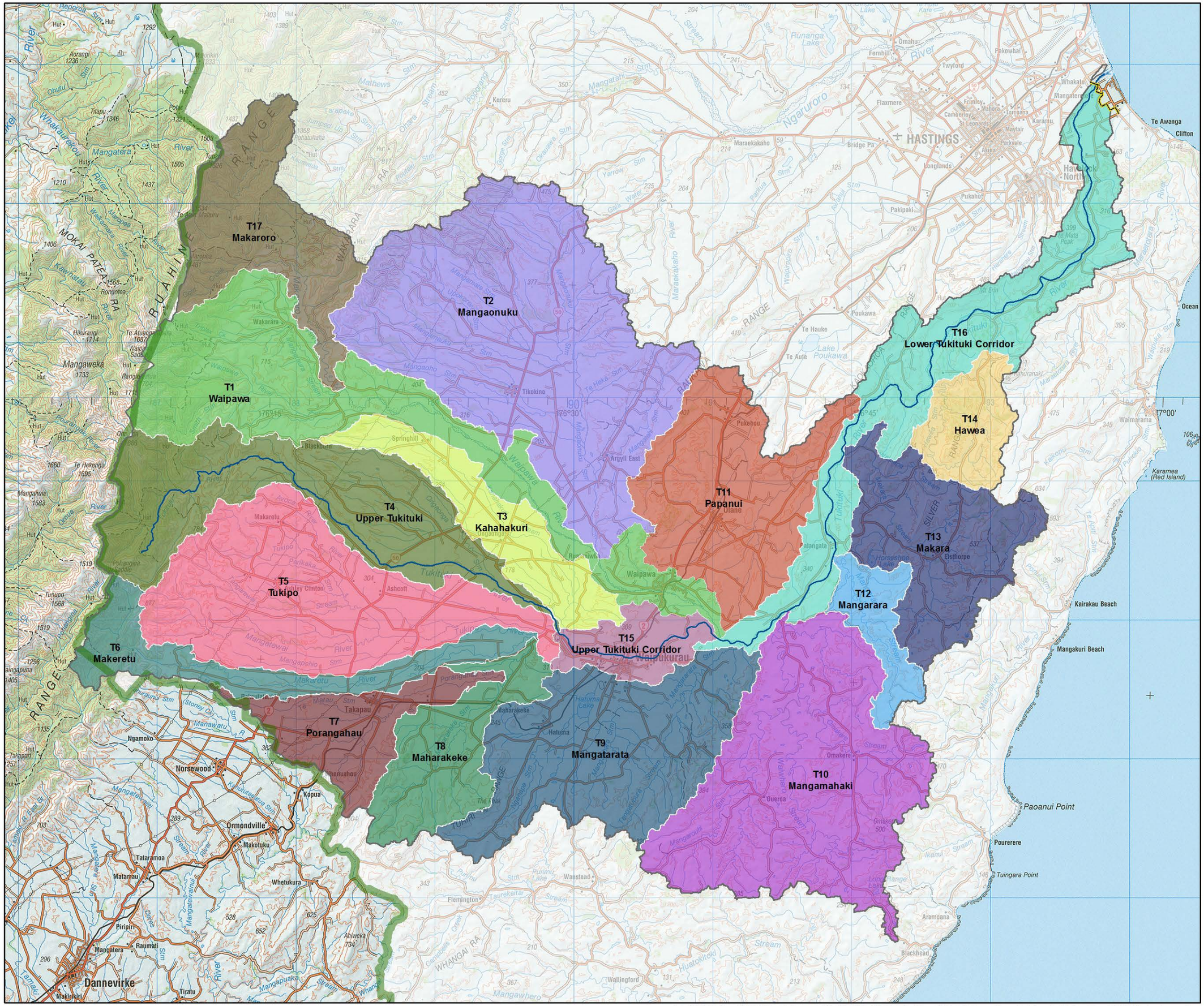
Schedule XIV - Heretaunga Plains sub-region: location map

Schedule XIVa – Heretaunga Plains sub-region - indicative location map of residential greenfield growth areas for period 2015 - 2045



Schedule XIVb – Heretaunga Plains sub-region - indicative location map of industrial greenfield growth areas for period 2015 - 2045





Coastal Environmental Inland Bdy

Area covered by Proposed Plan Change 6

Tukituki Water Management sub Catchments

- <all other values>
- T1 Waipawa
- T2 Mangaonuku
- T3 Kahahakuri
- T4 Upper Tukituki
- T5 Tukipo
- T6 Makaretu
- T7 Porangahau
- T8 Maharakeke
- T9 Mangatarata
- T10 Mangamahaki
- T11 Papanui
- T12 Mangarara
- T13 Makara
- T14 Hawea
- T15 Upper Tukituki Corridor
- T16 Lower Tukituki Corridor
- T17 Makaroro

SCHEDULE XIVc

Tukituki River

Sub Catchments

N

1:250,000

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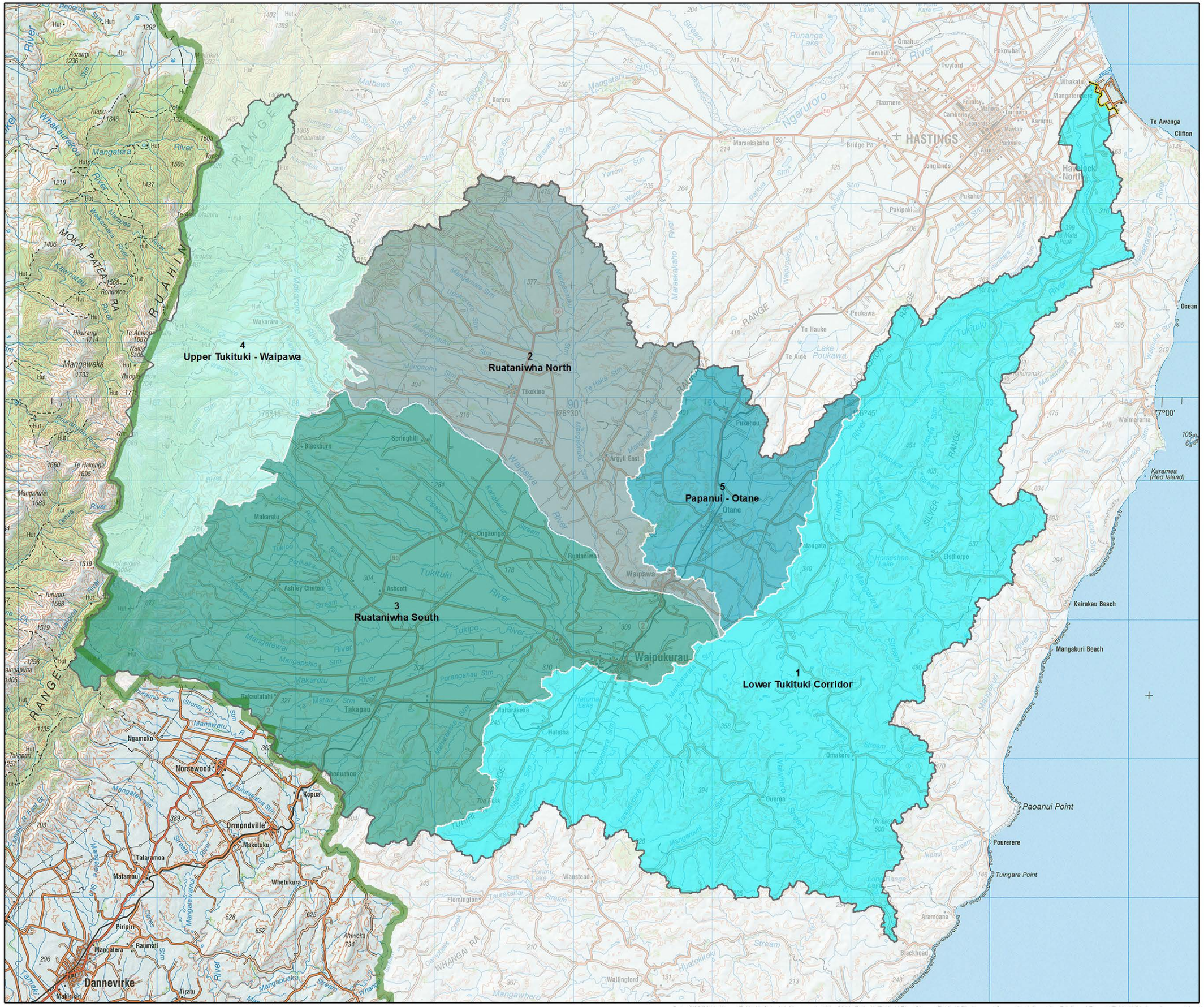

Coastal Environmental Inland Bdy

Area covered by Proposed Plan Change 6

Water Quality Management Zones

1 Lower Tukituki Corridor
2 Ruataniwha North
3 Ruataniwha South
4 Upper Tukituki - Waipawa
5 Papanui - Otane

SCHEDULE XV

Tukituki Plan Change 6

Water Management Zones

N

1:250,000

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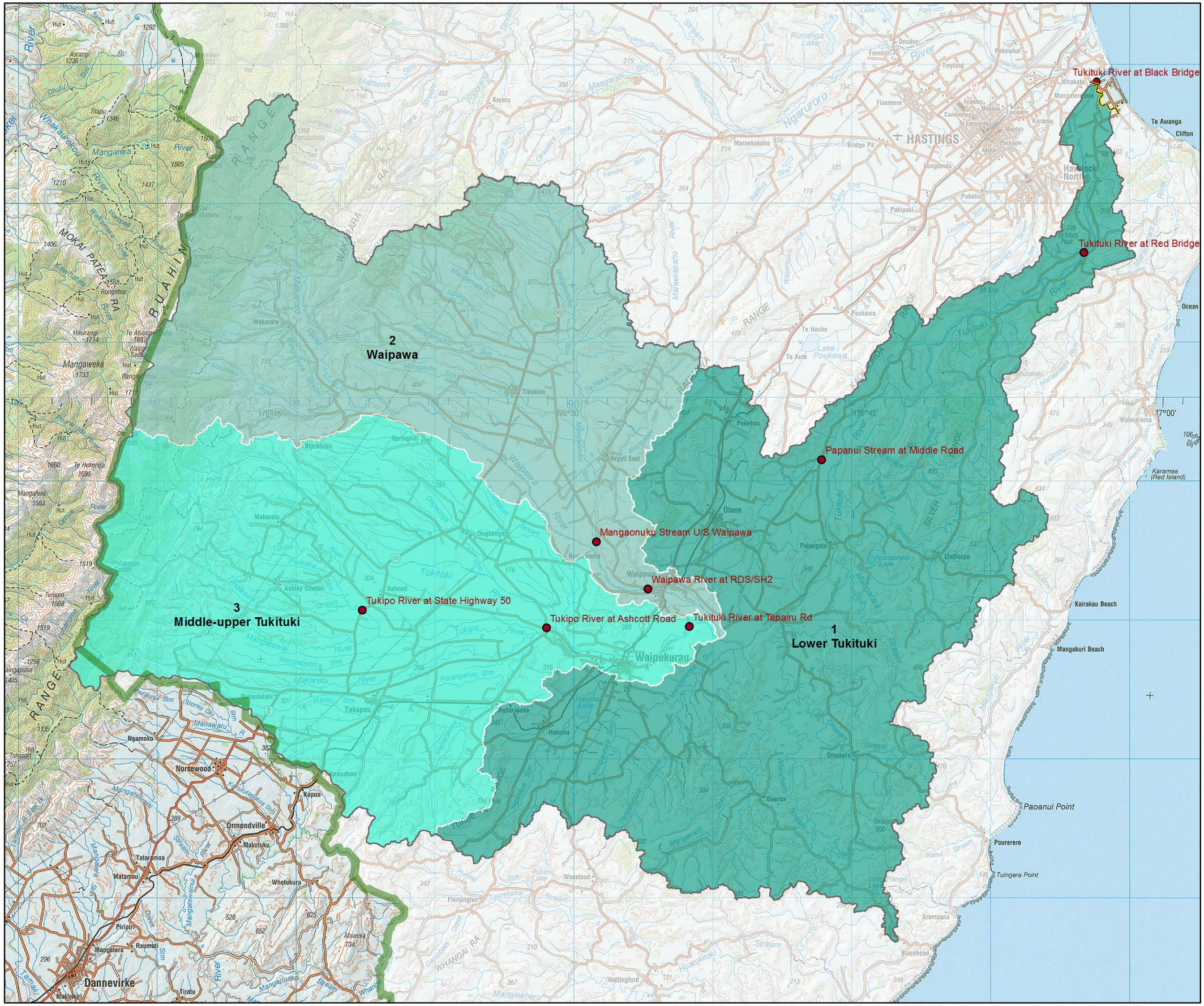

Coastal Environmental Inland Bdy

Area covered by Proposed Plan Change 6

Minimum Flow Recording Sites

Surface Water Allocation Zones

- 1, Lower Tukituki
- 2, Waipawa
- 3, Middle-upper Tukituki

SCHEDULE XVI

Tukituki Plan Change 6

Surface Water Allocation Zones & Minimum Flow Sites

N

1:250,000

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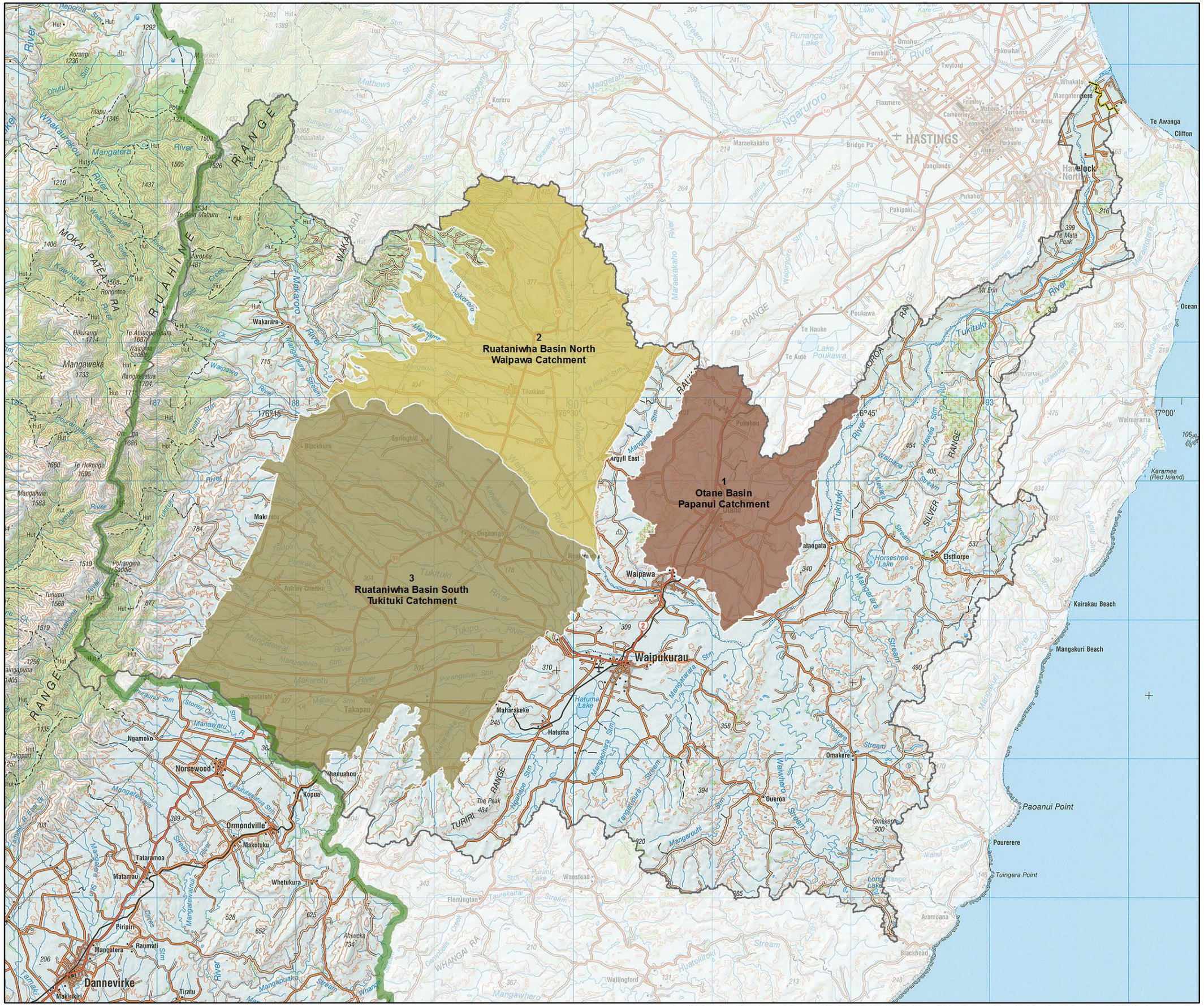


Coastal Environmental Inland Bdy

○ Area covered by Proposed Plan Change 6

Tukituki Water Allocation Zones GW

- ● 1, Otane Basin, Papanui Catchment
- ● 2, Ruataniwha Basin North, Waipawa Catchment
- ● 3, Ruataniwha Basin South, Tukituki Catchment

SCHEDULE XVII

Tukituki Plan Change 6

Groundwater Allocation Zones

N

1:250,000

HAWKE'S BAY REGIONAL COUNCIL

DATA FROM: Farm information obtained from the Hawke's Bay Regional Council's Geographic Information Systems Database.

Schedule XVIII.
Determination of seasonal and annual allocations for water permits as at 29 August 2013 (Tukituki River Catchment)

The method to be used for setting the seasonal and annual volumes for existing water permits is explained in this Schedule.

A. Groundwater Take Consents Within Groundwater Allocation Zones 1 -3 (Table 5.9.5 Tranche 1)

1. The Hawke's Bay Regional Council will determine the seasonal volume for each farming property or farming enterprise with an existing groundwater take consent for irrigation that is consistent with Policy 32. The seasonal volumes will be calculated using a consistent and appropriate scientific methodology[7] across all takes within the same groundwater allocation zone that will achieve a result consistent with Policy 32. Appropriate scientific methodologies include:

   - Soil Plant Atmosphere System Model (SPASMO-ir), Plant and Food Research;
   - IrriCalc, Aqualinc Research Limited, Report No C09065/4, November 2009).

   Allocation of water for each farming property or farming enterprise shall take into account multiple consents for irrigation of the same area. Ancillary uses of water (e.g. dairy shed supply) also specified as an authorised use by the consent shall be considered and provided for. This seasonal volume shall be the Seasonal Water Use Limit for each farming property or farming enterprise (*Volume A*).

2. In order to achieve consistency and equity between farming properties and farming enterprises, the seasonal volumes (*Volume A's*) will be derived without reference to any weekly or seasonal volume limits on the existing consents. The crop area and type as specified by the consent at 29 August 2013 and the mean daily flow rate[8], will be used for the purposes of calculating a seasonal volume as follows:

   a. Subject to (b) below, the mean daily flow rate will be divided by the consented crop area (ha) to determine the flow rate per hectare. The maximum flow rate per hectare shall not exceed the 90 percentile mean daily irrigation flow rate per hectare irrigated.[9]

   b. To avoid 'water banking', the seasonal volume assigned to the farming property or farming enterprise will be based on the area of land for which actual irrigation infrastructure exists at 31 May 2015, unless the applicant / consent holder has an implementation plan in place that demonstrates how full irrigation of their consented irrigation area will occur by 31 May 2018.

3. The Hawke's Bay Regional Council will sum all of the *Volume A* limits for the farming properties or farming enterprises, excluding the volume allocated to non-irrigation use consents, and this shall be called the *Aggregate Volume A*.

4. The Hawke's Bay Regional Council will determine the *Pro-rata Ratio* for each Groundwater Allocation Zone which shall be *Table 5.9.5 Groundwater Allocation Limit* excluding the volume allocated to non-irrigation use consents divided by *Aggregate Volume A.*

5. If the *Pro-rata Ratio* is equal to or greater than 1.0 then the groundwater allocation for each farming property or farming enterprise shall be the Seasonal Water Use Limit (*Volume A*).

6. If the *Pro-rata Ratio* is less than 1.0 then the groundwater allocation for each farming property or farming enterprise shall be the *Pro-rata Ratio* multiplied by Seasonal Water Use Limit (*Volume A*) for that farming property or farming enterprise.

7. For non-irrigation use consents, the annual volume shall be the existing consented annual volume, or if this is not specified, the weekly volume multiplied by 52 weeks.

8. Hawke's Bay Regional Council will additionally impose instantaneous limits of abstraction[10] (L/s) in all cases, and it may additionally impose 7 day or 28 day abstraction limits on a case by case basis.

B. Groundwater takes outside of Groundwater Allocation Zones

9. For groundwater takes outside of Groundwater Allocation Zones the seasonal volume will be set in accordance with clause 1 above. Clauses 7 and 8 will also apply.

C. Surface water Takes

10. For surface water takes the seasonal volume will be set in accordance with Policy 42. The seasonal volumes will be calculated using a consistent methodology across all takes within the same surface water allocation zone, and an appropriate scientific methodology that will achieve a result consistent with Policy 42. Appropriate scientific methodologies include:

    - Soil Plant Atmosphere System Model (SPASMO-ir), Plant and Food Research;
    - IrriCalc, Aqualinc Research Limited, Report No C09065/4, November 2009.

11. Hawke's Bay Regional Council will additionally impose instantaneous limits of abstraction47 (L/s) in all cases, and it may additionally impose 7 day or 28 day abstraction limits on a case by case basis.

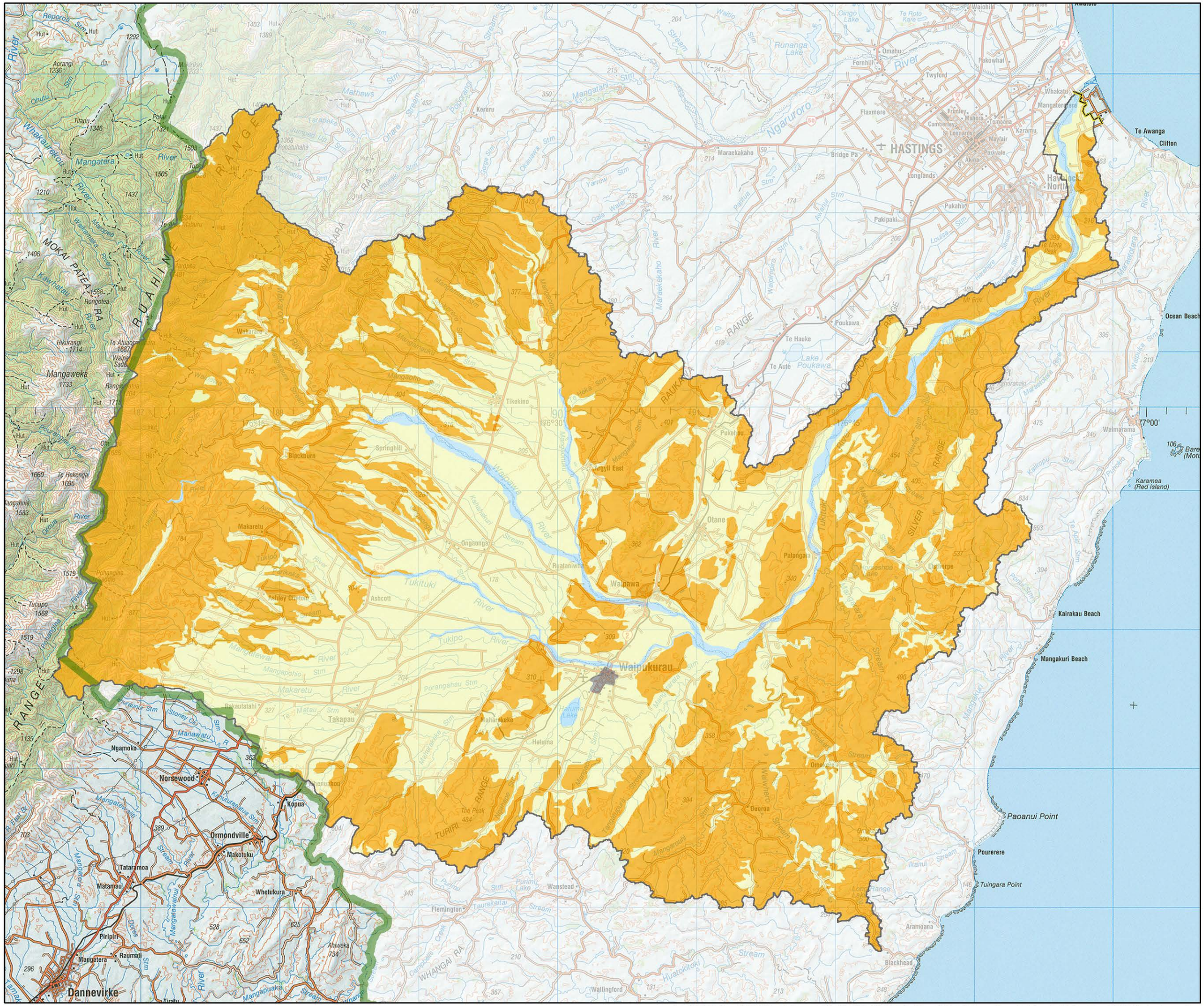
---

[7] The methodologies enable appropriate adjustments to model inputs to reflect particular circumstances.

[8] The mean daily flow rate will be determined from the number of pumping hours per day and the maximum instantaneous pumping rate.

[9] The 90 percentile mean daily irrigation flow rate per hectare is typically not more than 0.58 litres/sec/hectare (the equivalent of 5 mm per day) within Groundwater Allocation Zones 1 – 3.

[10] The maximum instantaneous rate is determined by the applicant and is generally based on what the bore / pump is capable of delivering or the irrigation system specifications. Unless there are well interference effects that need to be managed through an adjustment in the instantaneous rate, it is the rate determined by the applicant that the Council will set as the maximum instantaneous rate on the resource consent.



━ Coastal Environmental Inland Bdy

○ Area covered by Proposed Plan Change 6

Slope

GeneralSlope_Range

- 🟨 0 - 15
- 🟧 > 15
- ● lake
- ● river
- ● urban area

SCHEDULE XX

Tukituki Plan Change 6

Slope Classes

N

1:250,000

HAWKE'S BAY
REGIONAL COUNCIL

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Schedule XXI.
Records to be kept for nutrient budgeting input into a Farm Environmental Management Plan (Tukituki River Catchment)

Records to be kept include the information set out below:

(a) Identification of the land area of the farm.

(b) A map or aerial photograph showing the different blocks within the farm.

(c) A map of the LUC classifications within the farm and areas within each LUC.

(d) A Nutrient Budget including phosphorus loss and nitrogen leaching rates for the whole of farm operation.

(e) Nutrient Budget input and output files that have been prepared in accordance with an industry programme approved by Hawke's Bay Regional Council. Modelling and/or measurement inputs should as far as practicable be actual results for the farm properties when entered in compliance with Nutrient Budget modelling best practice data input standards. For example inputs should include actual farm soil tests taken within the preceding three years.

(f) Annual stocking rate (numbers, types and classes) including a breakdown by stock class for each month.

(g) A description of the farm management practices used on each block including (where applicable):

(i) Ground cover – pasture, crops, non-grazed areas (including forestry, riparian and tree areas);

(ii) Stock management – lambing/calving/fawning dates and percentages, any purchases and sales and associated dates, types and age of stock;

(iii) Fertiliser management practices - types, quantities, timing, location and rates of application and details of varying procedures for different blocks;

(iv) Winter management of cattle grazed off – including the use of feed pads, grazing off or standoff pads;

(v) Crop management practices – area cultivated, method of cultivation, crop types, rotations, timing of sowing and harvesting, resulting use of crop, where and when it is fed out on farm or when it is exported and where to;

(vi) Supplementary feed brought onto the farm - feed type, annual tonnage, dry matter content, feed quality, nitrogen content;

(vii) Use of nitrification inhibitors and any other verifiable nitrogen leaching inhibitors.

Advisory Note: Where any of the matters (i) to (vii) have not been implemented on a particular block then that should be stated.

(viii) The results of any soil tests undertaken on the farm in the previous 36 months.

(h) Copies of annual accounts to verify the above information.

(i) Copies of invoices or receipts for purchases of stock, fertiliser, supplements imported or exported.

(j) Farm animal effluent, pig farm effluent, feed pad and stand-off pad effluent management including:

(i) Area of land used for irrigation;

(ii) Annual nitrogen loading rate and nitrogen load rate per application;

(iii) Instantaneous application rate.

(k) Clean water irrigation in terms of areas irrigated, depths of water applied and irrigation systems used.

Schedule XXII.
Requirements for Farm Environmental Management Plans (Tukituki River Catchment)

A Farm Environmental Management Plan shall be prepared and implemented in accordance with either A or B below by a person with the appropriate professional qualifications. The plan shall take into account all sources of nutrients used for the farming activity and identify all relevant nutrient management practices and mitigation measures. The farm environmental management plan must clearly identify how the assigned industry 'good practices' and/or property nutrient allowances will be achieved. The plan requirements will apply to:

1. A plan prepared for an individual property or farming enterprise; or

2. A plan prepared for an individual property which is part of a farming enterprise or a collective of farm properties, including an irrigation scheme, an Industry Certification Scheme, or catchment club.

A Farm Environmental Management Plans prepared for individual farm properties or a farming enterprise that are part of an industry managed programme that has been approved by the Hawke's Bay Regional Council that includes the following attributes:

(a) A requirement for a farm management plan that includes as a minimum:

(i) The matters set out in B(1), B(2), B(3), B(4), B(5) and B(6) below;

(ii) Specified actions (if necessary) to address the risks to water quality associated with the major farming activities on the property and how the identified risks will be managed;

(iii) Measurement of nutrient losses or modelling using the OVERSEER™ Nutrient Budget model (or an alternative model approved by Hawke's Bay Regional Council), for each of the identified land management unit and the overall farm property in accordance with POL TT4;

(iv) Performance measures that are capable of being audited;

(b) A methodology that will enable the development of a plan that will identify the risks to water quality associated with the major farming activities on the property;

(c) Advice and technical support (including, for example, guidelines and templates) for the development and implementation of farm environmental plans;

(d) An audit system that audits the implementation of specific components of plans on a random sample basis across the Tukituki River catchment and on the basis of targeting farming operations that pose a high risk to water quality;

(e) A system of actions and/or consequences, for a farm property if and when an audit reveals non-compliance by that farm property with the A(a)(iv) performance measures.

B Farm Environmental Management Plans prepared for individual farm properties or a farming enterprise that are not part of an industry managed programme. The plan shall contain as a minimum:

1. Property details

(a) Physical address

(b) Description of the ownership and name of a contact person

(c) Legal description of the land and farm identifier

2. A map(s) or aerial photograph at a scale that clearly shows:

(a) The boundaries of the property

(b) The boundaries of the main land management units on the property.

(c) The location of permanent or intermittent rivers, streams, lakes, drains, ponds or wetlands.

(d) The location of riparian vegetation and fences adjacent to water bodies.

(e) The location of storage facilities, offal or refuse disposal pits, feeding or stock holding areas, effluent blocks, raceways, tracks and crossings.

(f) The location of any areas within or adjoining the property that are identified in a District Plan as "significant indigenous biodiversity".

(g) A Map of the LUC classifications within the farm and the areas within each LUC.

3. An assessment of the risks to water quality associated with the major farming activities on the property and how the identified risks will be managed.

4. A Phosphorus Management Plan as defined in the Glossary

5. A description of how each of the following management objectives will, where relevant, be met.

(a) *Nutrient management*: To minimise nutrient losses to water and achieve the Tukituki LUC Natural Capital; Nitrogen Leaching Rates in Table 5.9.1D on a whole of farm property or whole of farming enterprise basis.

(b) *Irrigation management*: To operate irrigation systems that are capable of applying water efficiently and management that ensures actual use of water is monitored and is efficient (including deficit irrigation and consideration of the use of precision irrigation).

(c) *Soils management*: To maintain or improve the physical and biological condition of soils in order to minimise the movement of sediment, phosphorus and other contaminants to waterbodies.

(d) *Wetlands and riparian management*: To manage wetland and waterway margins to avoid damage to the bed and margins of a water body, avoid direct input of nutrients, and to maximise riparian margin nutrient filtering.

(e) *Collected animal effluent management*: To manage the risks associated with the operation of effluent systems to ensure effluent systems are compliant 365 days of the year.

(f) *Livestock management*: To manage wetlands and water bodies so that stock are excluded from water in accordance with Rule TT1, to avoid damage to the bed and margins of a water body, and to avoid the direct input of nutrients, sediment, and microbial pathogens.

The plan shall include for each management objective:

(a) user defined measurable targets that clearly set a pathway and timeframe for achievement of the objective.

(b) a description of the good management practices together with actions required to achieve the objective and targets.

(c) the records for measuring performance and achievement of the target.

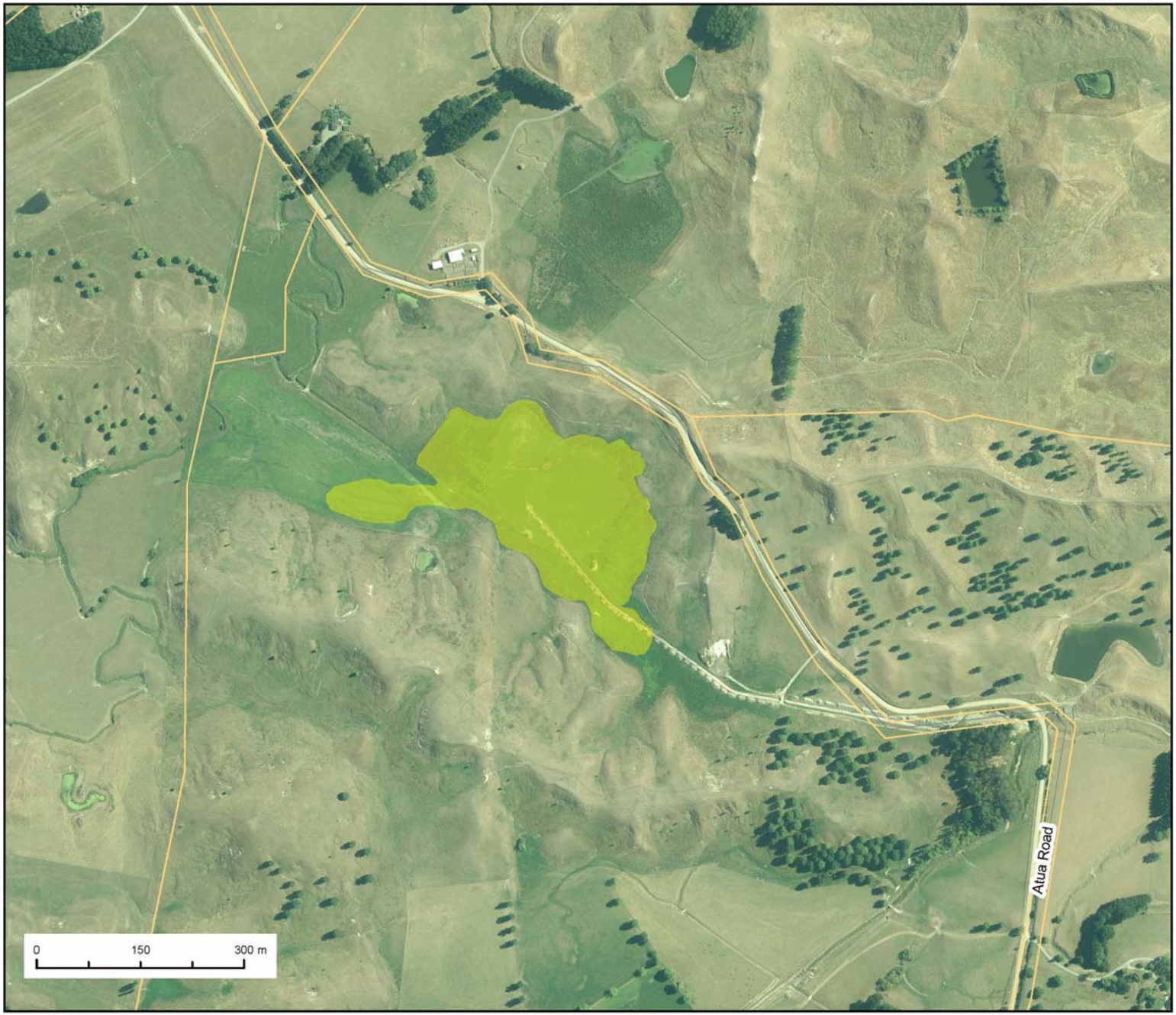
6. Nutrient Budgets prepared using the OVERSEER™ Nutrient Budget model (or an alternative model approved by the Hawke's Bay Regional Council), for each of the identified land management unit~~s~~ and the overall farm property in accordance with POL TT4.

C Farm Environmental Management Plans shall be updated at three yearly intervals from 1 June 2018.

Schedule XXIII.
Total ammoniacal nitrogen concentrations at other pHs and temperatures (Tukituki River Catchment)

Chronic total ammoniacal-N concentration (mgTNH_3-N/L) limit at different water pH and temperature.

	Water Temperature (˚C)															
pH	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	**30**
6.5	14.1	13.1	12.2	11.3	10.5	9.75	9.06	8.43	7.84	7.30	6.80	6.34	5.91	5.51	5.14	4.80
6.6	11.2	10.4	9.67	8.97	8.33	7.74	7.20	6.70	6.23	5.80	5.40	5.04	4.70	4.38	4.09	3.82
6.7	8.93	8.28	7.68	7.13	6.62	6.15	5.72	5.32	4.95	4.61	4.30	4.00	3.73	3.48	3.25	3.04
6.8	7.10	6.58	6.10	5.67	5.26	4.89	4.55	4.23	3.94	3.67	3.41	3.18	2.97	2.77	2.58	2.41
6.9	5.64	5.23	4.85	4.50	4.18	3.89	3.61	3.36	3.13	2.91	2.71	2.53	2.36	2.20	2.06	1.92
7.0	4.48	4.16	3.86	3.58	3.33	3.09	2.87	2.67	2.49	2.32	2.16	2.01	1.88	1.75	1.64	1.53
7.1	3.56	3.30	3.07	2.85	2.64	2.46	2.29	2.13	1.98	1.84	1.72	1.60	1.49	1.39	1.30	1.22
7.2	2.83	2.63	2.44	2.26	2.10	1.95	1.82	1.69	1.57	1.47	1.37	1.27	1.19	1.11	1.04	0.968
7.3	2.25	2.09	1.94	1.80	1.67	1.56	1.45	1.35	1.25	1.17	1.09	1.01	0.947	0.884	0.826	0.772
7.4	1.79	1.66	1.54	1.43	1.33	1.24	1.15	1.07	1.00	0.930	0.867	0.809	0.755	0.705	0.658	0.615
7.5	1.43	1.32	1.23	1.14	1.06	0.986	0.917	0.854	0.795	0.741	0.691	0.645	0.602	0.562	0.525	0.491
7.6	1.13	1.05	0.98	0.91	0.844	0.785	0.731	0.681	0.634	0.591	0.551	0.515	0.481	0.449	0.420	0.393
7.7	0.904	0.839	0.779	0.724	0.673	0.626	0.583	0.543	0.506	0.472	0.441	0.411	0.384	0.359	0.336	0.315
7.8	0.721	0.669	0.621	0.578	0.537	0.500	0.466	0.434	0.405	0.378	0.352	0.329	0.308	0.288	0.269	0.252
7.9	0.575	0.534	0.496	0.461	0.429	0.400	0.372	0.347	0.324	0.302	0.283	0.264	0.247	0.231	0.217	0.203
8.0	0.459	0.427	0.397	0.369	0.344	0.320	0.298	0.278	0.260	0.243	0.227	0.212	0.199	0.186	0.175	0.164
8.1	0.37	0.341	0.318	0.296	0.275	0.257	0.240	0.224	0.209	0.195	0.183	0.171	0.160	0.150	0.141	0.133
8.2	0.294	0.274	0.255	0.237	0.221	0.206	0.193	0.180	0.168	0.158	0.148	0.138	0.130	0.122	0.115	0.108
8.3	0.236	0.220	0.205	0.191	0.178	0.167	0.156	0.146	0.136	0.128	0.120	0.112	0.106	0.099	0.094	0.088
8.4	0.190	0.177	0.165	0.154	0.144	0.135	0.126	0.118	0.111	0.104	0.098	0.092	0.086	0.081	0.077	0.073
8.5	0.154	0.143	0.134	0.125	0.117	0.110	0.103	0.096	0.091	0.085	0.080	0.075	0.071	0.067	0.064	0.060
8.6	0.124	0.116	0.109	0.102	0.095	0.090	0.084	0.079	0.074	0.070	0.066	0.062	0.059	0.056	0.053	0.050
8.7	0.101	0.095	0.089	0.083	0.078	0.074	0.069	0.065	0.062	0.058	0.055	0.052	0.049	0.047	0.045	0.042
8.8	0.083	0.078	0.073	0.069	0.065	0.061	0.058	0.054	0.051	0.049	0.046	0.044	0.042	0.040	0.038	0.036
8.9	0.068	0.064	0.061	0.057	0.054	0.051	0.048	0.046	0.043	0.041	0.039	0.037	0.036	0.034	0.033	0.031
9.0	0.057	0.054	0.051	0.048	0.045	0.043	0.041	0.039	0.037	0.035	0.034	0.032	0.031	0.030	0.028	0.027
9.1	0.048	0.045	0.043	0.041	0.039	0.037	0.035	0.033	0.032	0.031	0.029	0.028	0.027	0.026	0.025	0.024
9.2	0.040	0.038	0.036	0.035	0.033	0.032	0.030	0.029	0.028	0.027	0.026	0.025	0.024	0.023	0.022	0.022
9.3	0.035	0.033	0.031	0.030	0.029	0.028	0.027	0.026	0.025	0.024	0.023	0.022	0.022	0.021	0.020	0.020
9.4	0.030	0.029	0.028	0.026	0.025	0.024	0.024	0.023	0.022	0.021	0.021	0.020	0.020	0.019	0.019	0.018
9.5	0.026	0.025	0.024	0.024	0.023	0.022	0.021	0.021	0.020	0.020	0.019	0.019	0.018	0.018	0.017	0.017



Schedule 24a

Atua Road (North) 'wetland'

Legend

- Area referred in 'Wetland' definition
- Property boundary

N

HAWKE'S BAY REGIONAL COUNCIL

DATA FROM: Farm information obtained from the Hawke's Bay Regional Council's Geographic Information Systems Database.

DISCLAIMER
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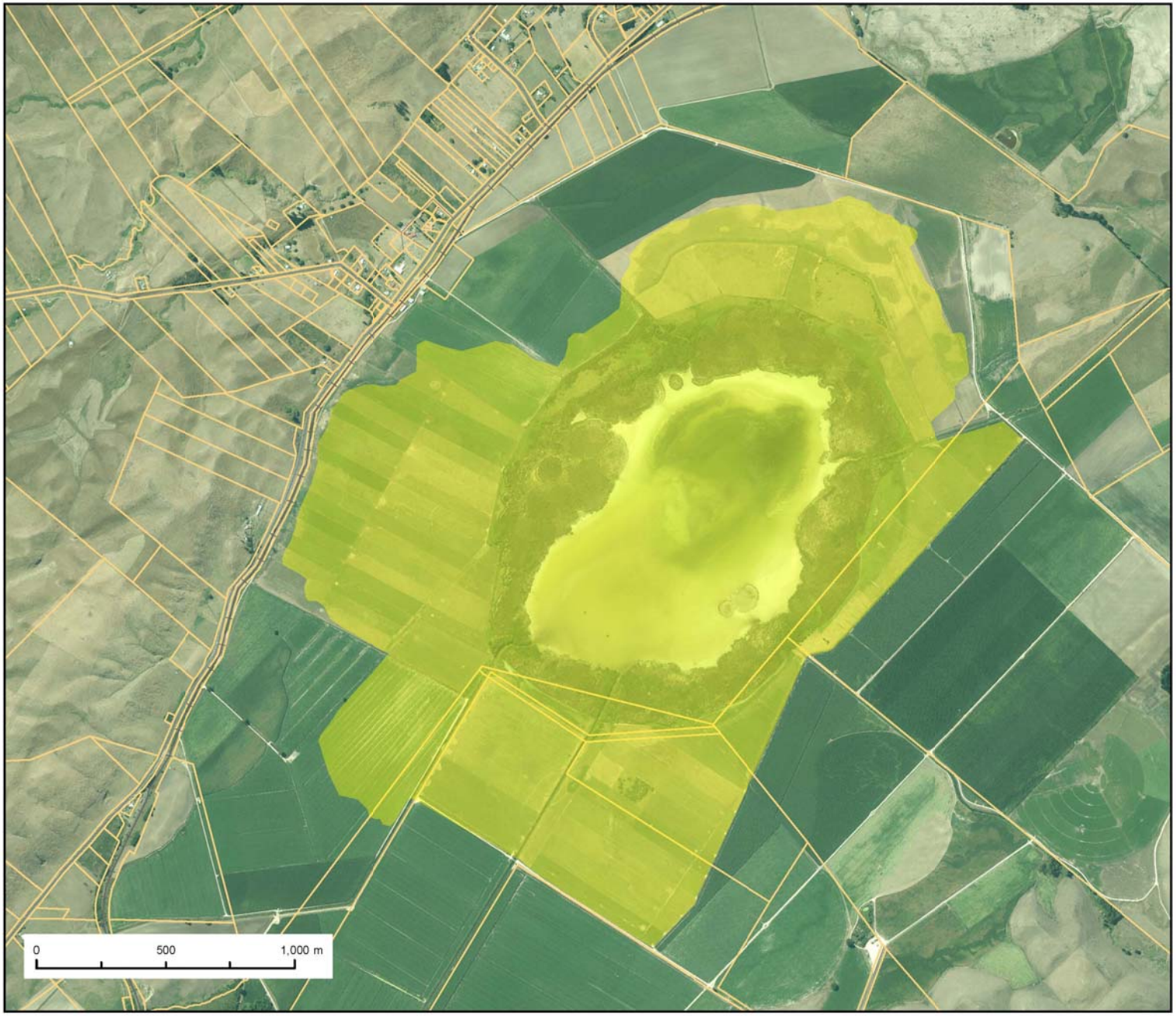
Date Printed: 11/10/2018



Schedule 24b

Lake Poukawa 'wetland'

Legend

- Area referred in 'Wetland' definition
- Property boundary

N

HAWKE'S BAY REGIONAL COUNCIL

DATA FROM: Farm information obtained from the Hawke's Bay Regional Council's Geographic Information Systems Database.

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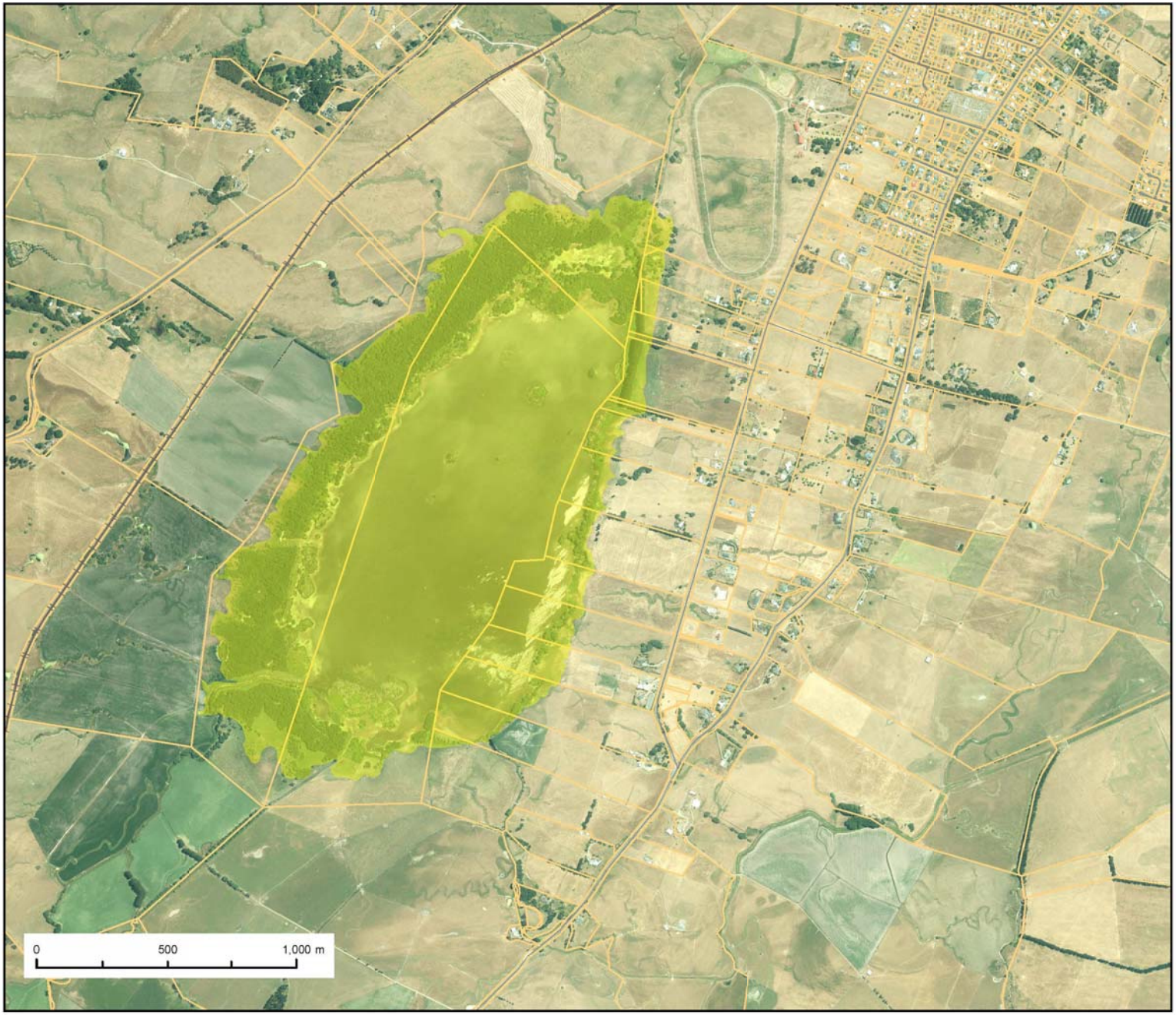

Schedule 24c

Lake Whatuma 'wetland'

Legend

- Area referred in 'Wetland' definition
- Property boundary

N

HAWKE'S BAY REGIONAL COUNCIL

DATA FROM: Farm information obtained from the Hawke's Bay Regional Council's Geographic Information Systems Database.

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Date Printed: 11/10/2018

Schedule 24d

Wanstead 'wetland'

Legend

- Area referred in 'Wetland' definition
- Property boundary

N

HAWKE'S BAY
REGIONAL COUNCIL

DATA FROM: Farm information obtained from the Hawke's Bay Regional Council's Geographic Information Systems Database.

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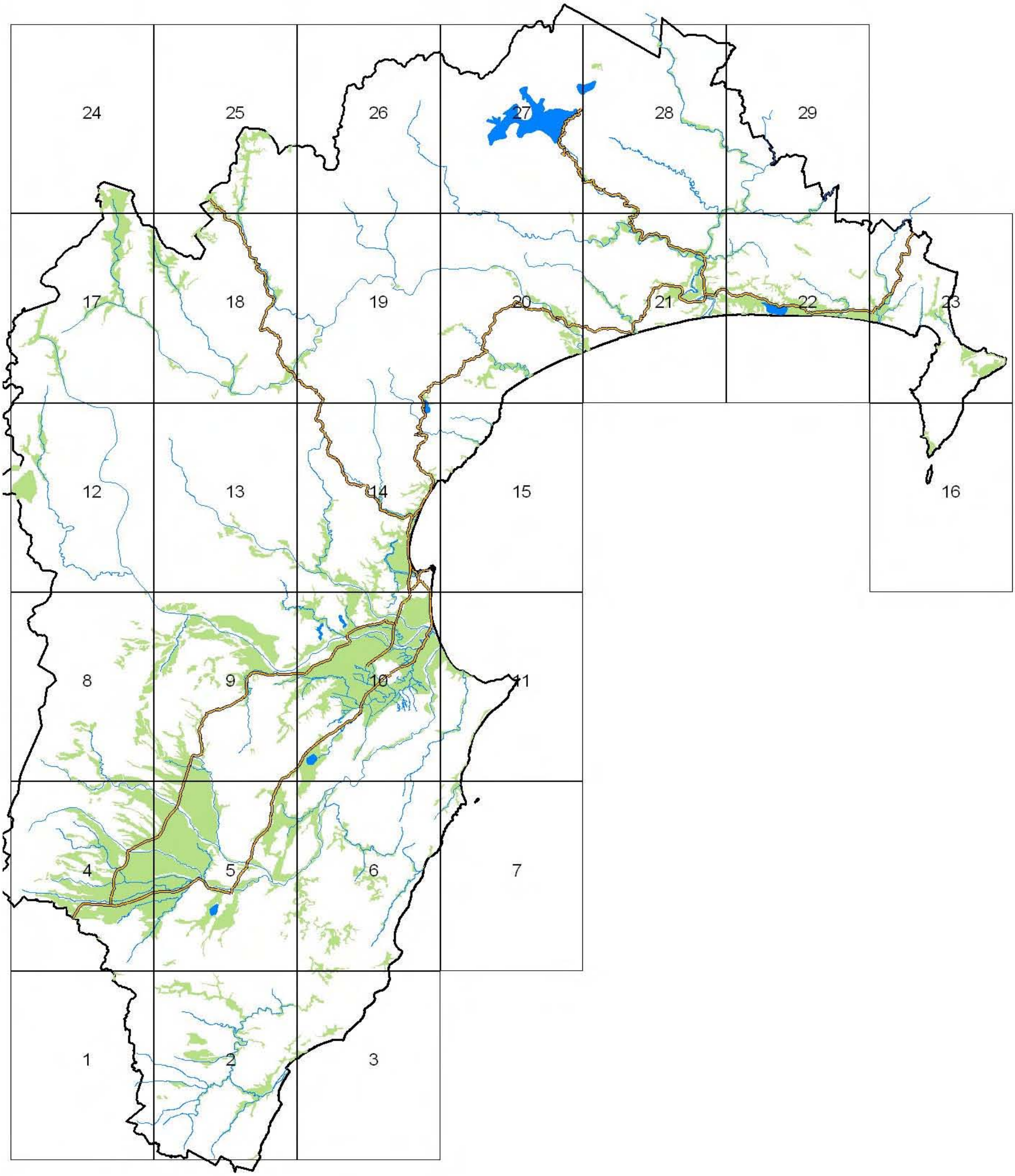
Date Printed: 11/10/2018



HAWKE'S BAY REGIONAL COUNCIL

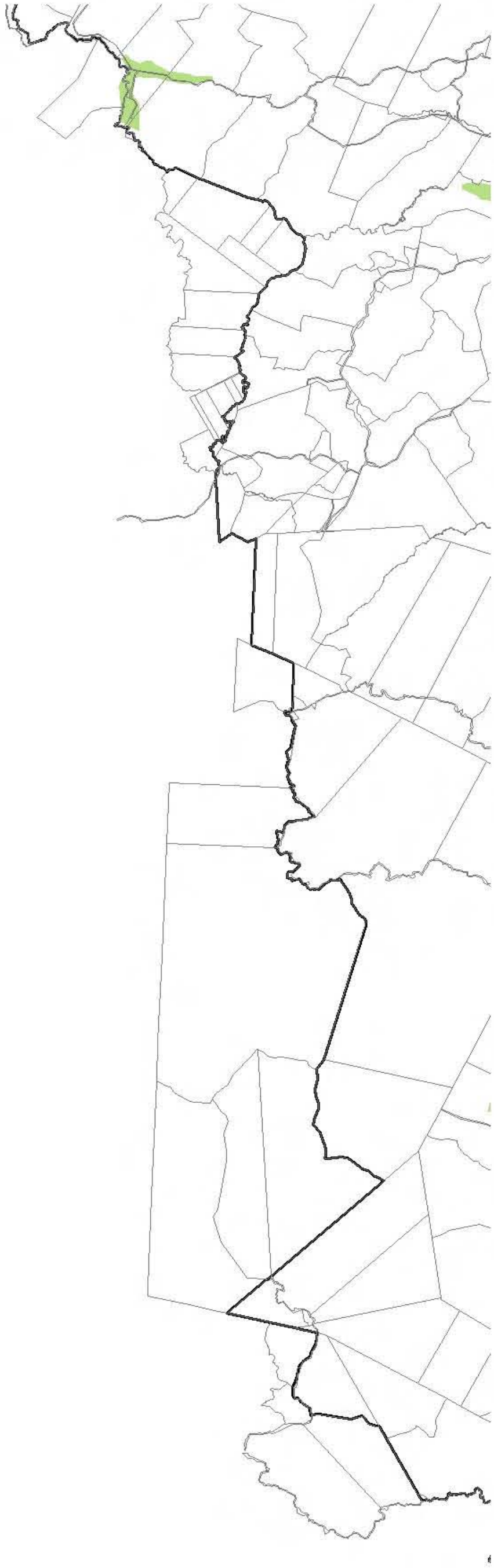
RULE 7: Areas Excluded from Conditions (c)

Index Sheet

N

Scale 1 : 675,000

DATA FROM: Cadastral and topographic Information obtained from Land Information New Zealand.



HAWKE'S BAY
REGIONAL COUNCIL

RULE 7: Areas Excluded from Conditions (c)

N

Scale 1 : 100,000

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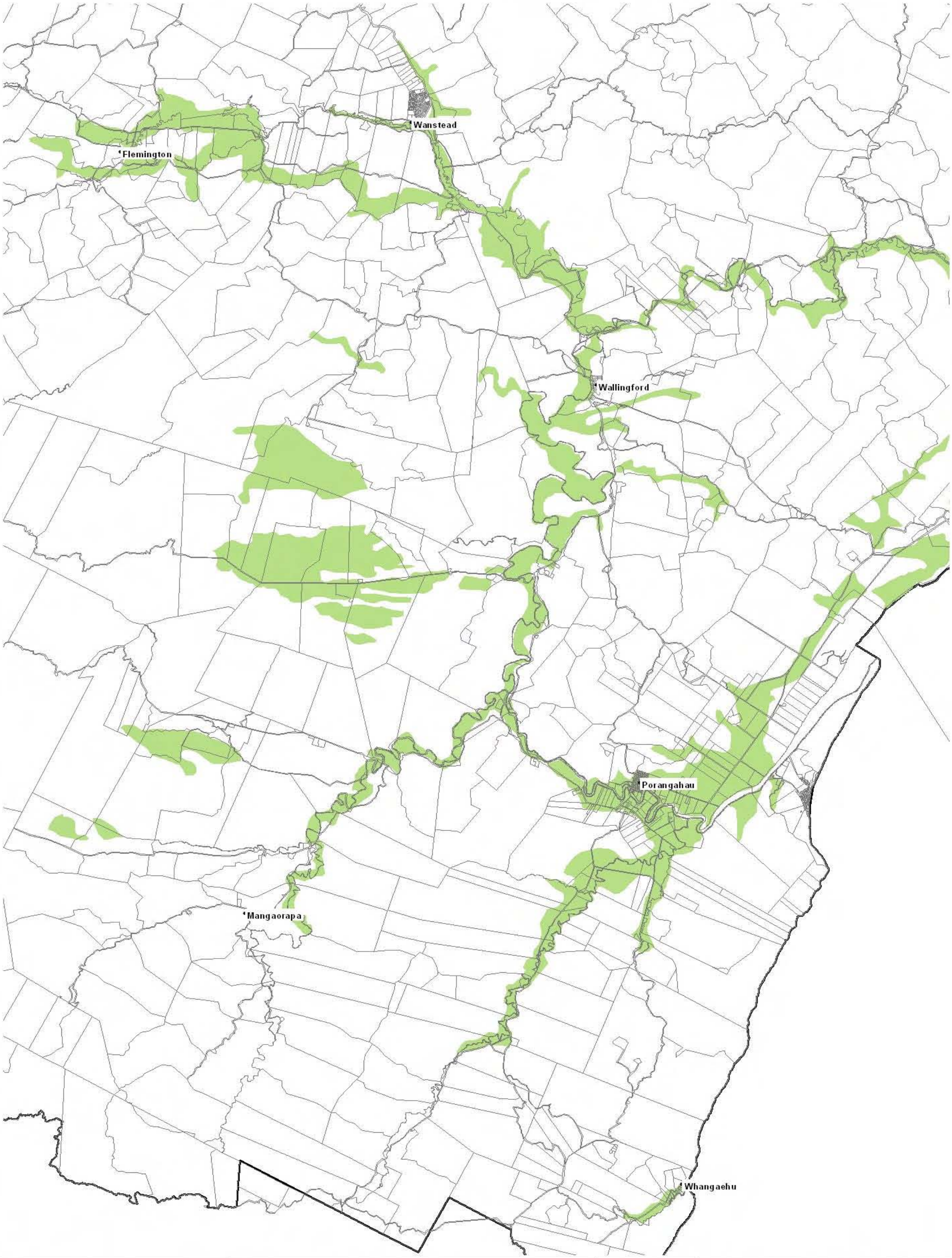

HAWKE'S BAY REGIONAL COUNCIL

RULE 7: Areas Excluded from Conditions (c)

N

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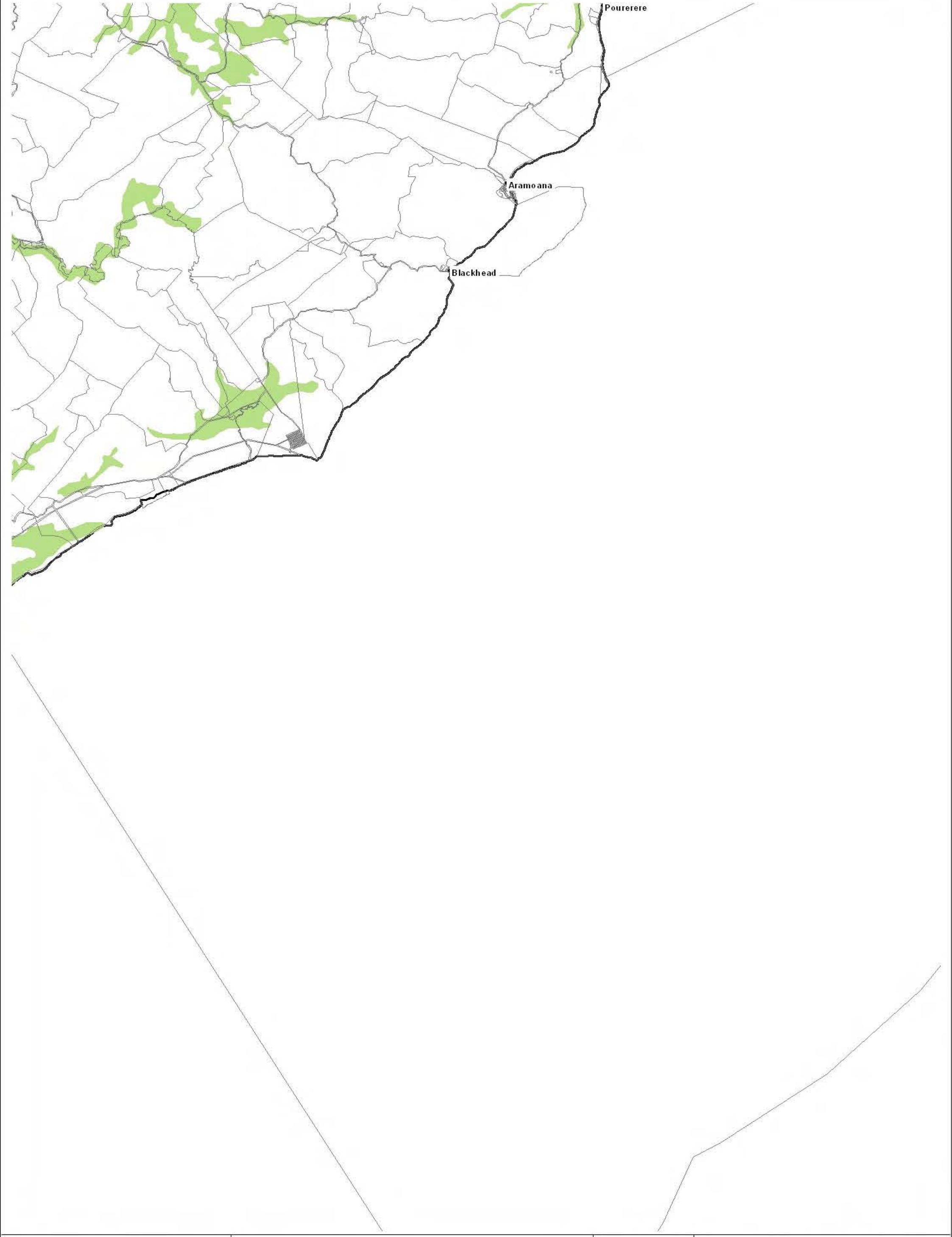

HAWKE'S BAY
REGIONAL COUNCIL

RULE 7: Areas Excluded from Conditions (c)

N

Scale 1 : 100,000

HAWKE'S BAY REGIONAL COUNCIL

RULE 7: Areas Excluded from Conditions (c)

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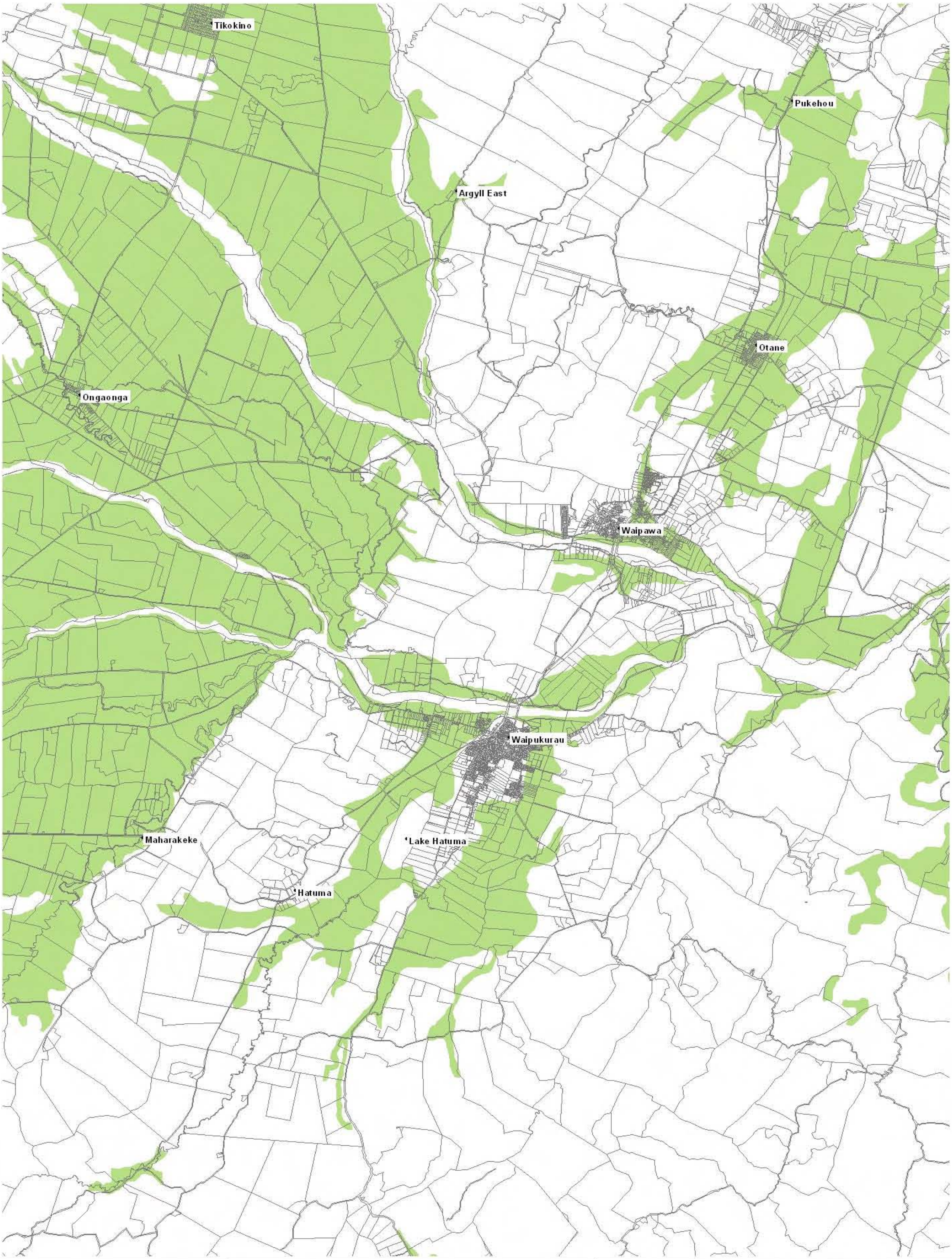

HAWKE'S BAY REGIONAL COUNCIL

RULE 7: Areas Excluded from Conditions (c)

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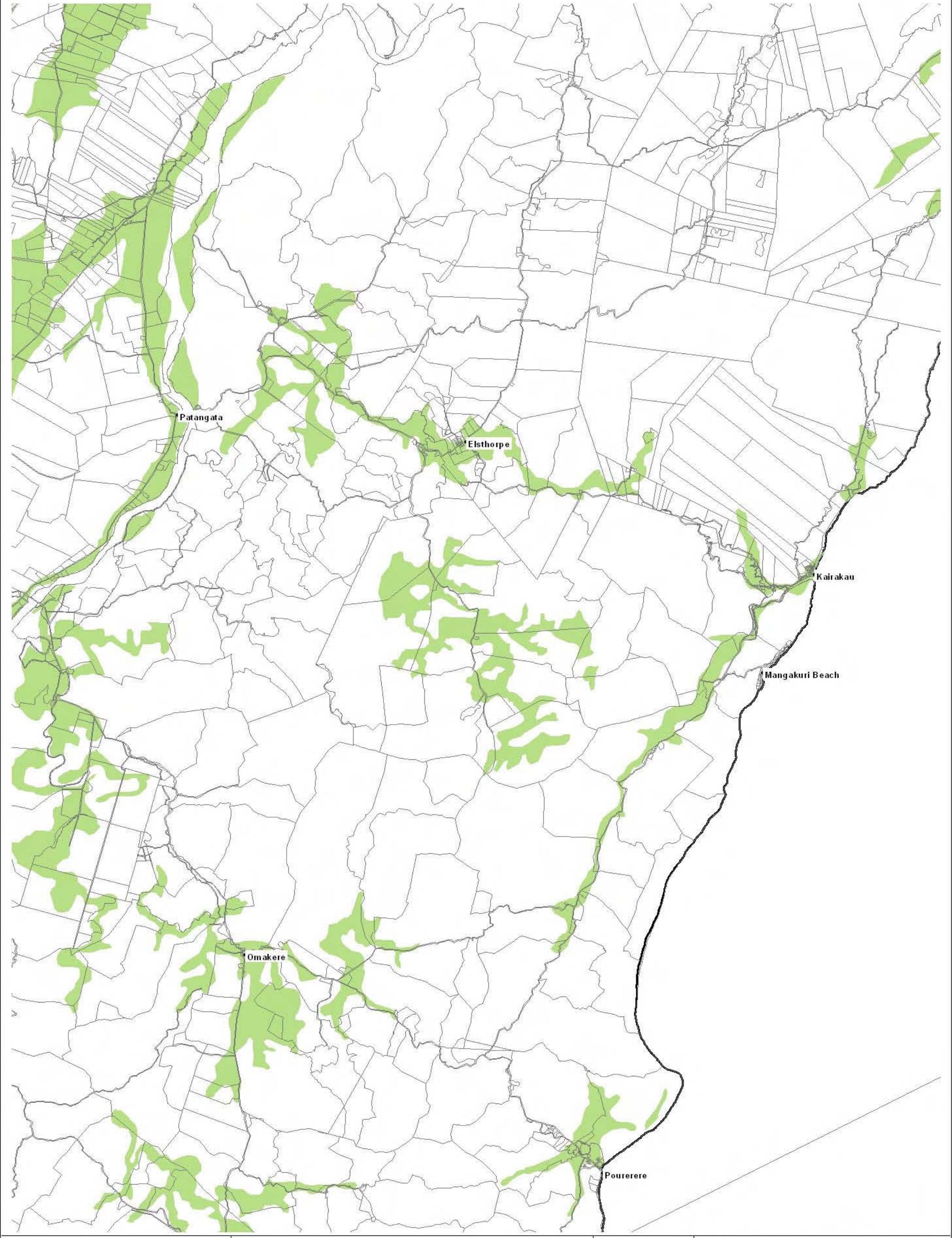

HAWKE'S BAY REGIONAL COUNCIL

RULE 7: Areas Excluded from Conditions (c)

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HAWKE'S BAY
REGIONAL COUNCIL

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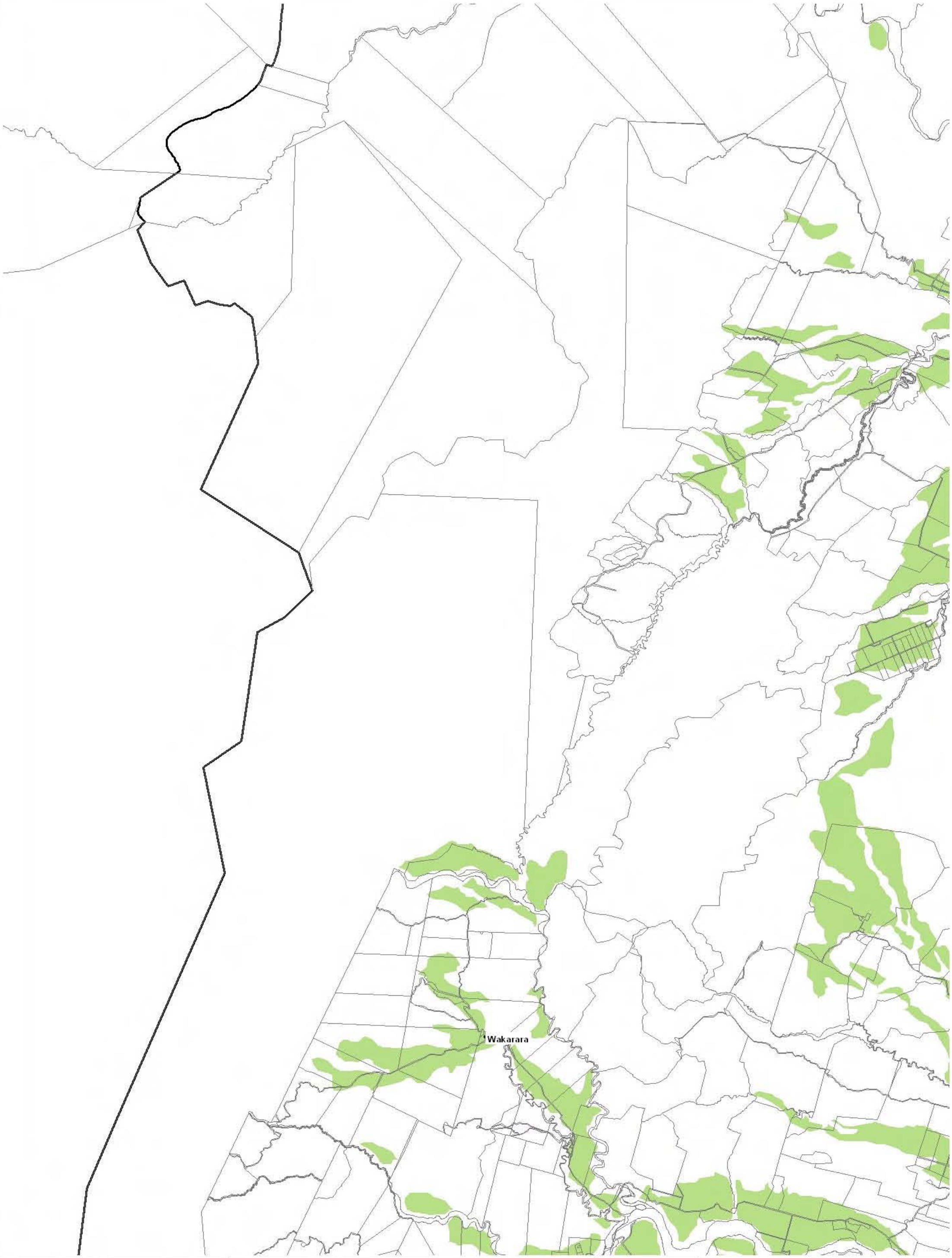

HAWKE'S BAY
REGIONAL COUNCIL

RULE 7: Areas Excluded from Conditions (c)

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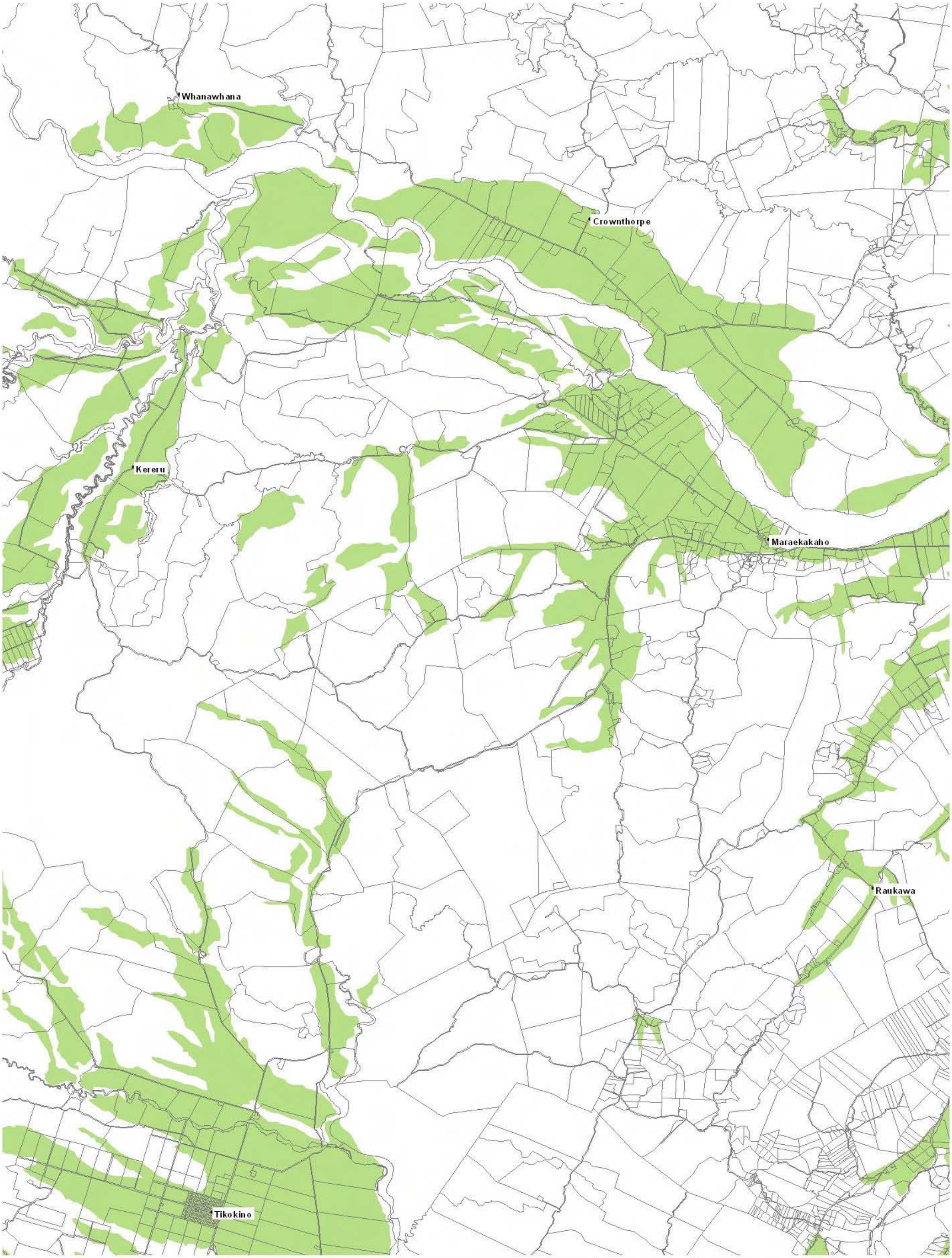

HAWKE'S BAY REGIONAL COUNCIL

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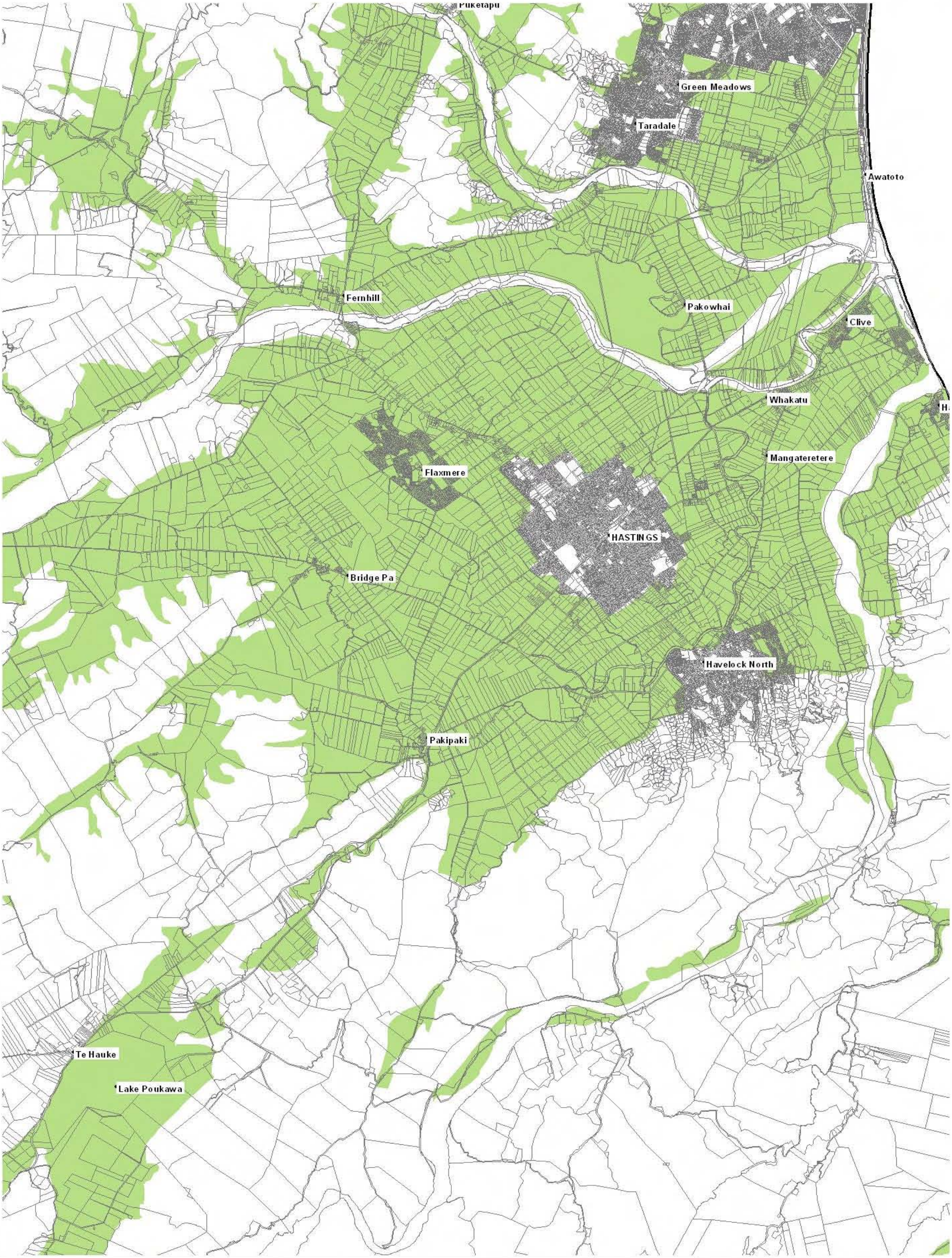

HAWKE'S BAY REGIONAL COUNCIL

RULE 7: Areas Excluded from Conditions (c)

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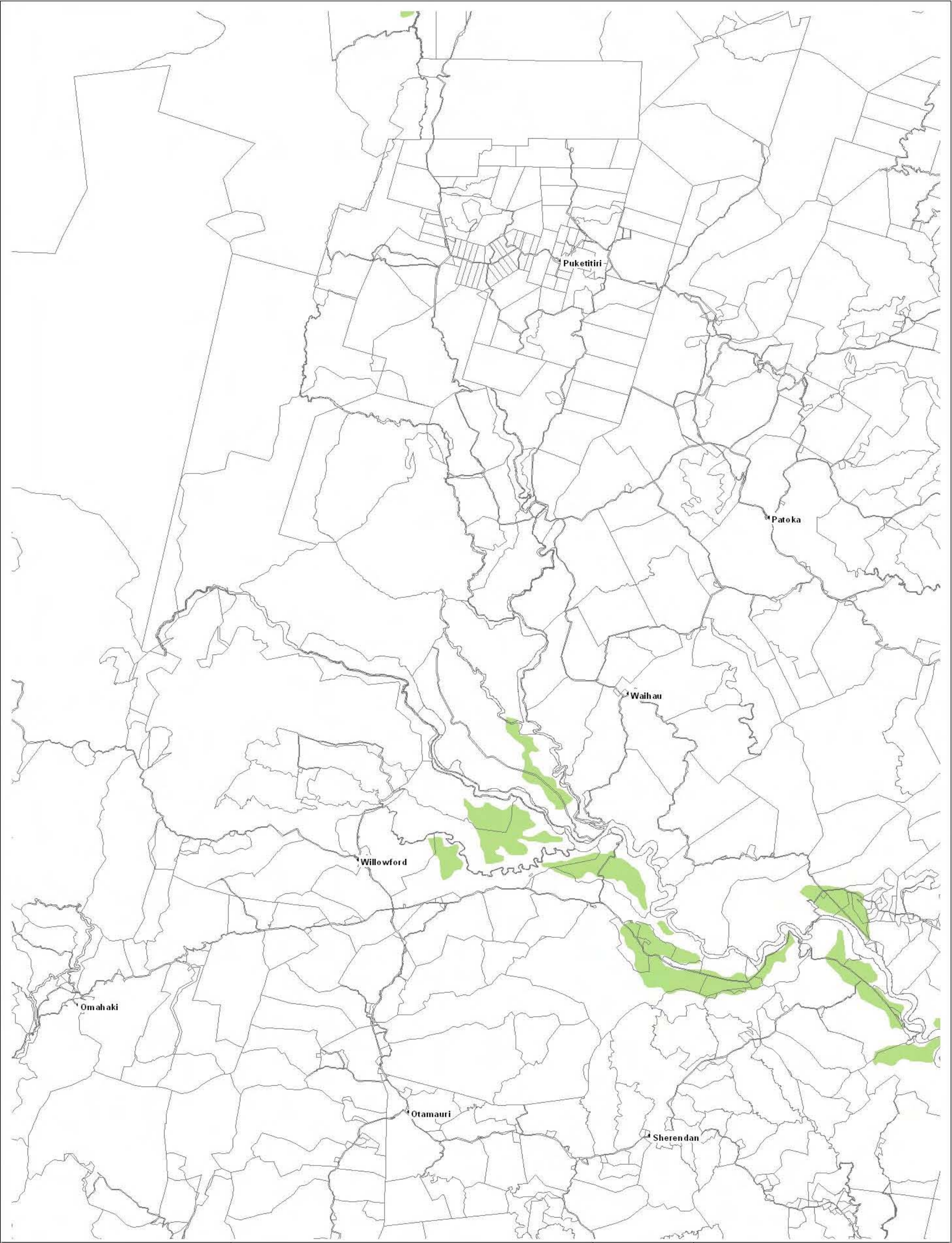

HAWKE'S BAY REGIONAL COUNCIL

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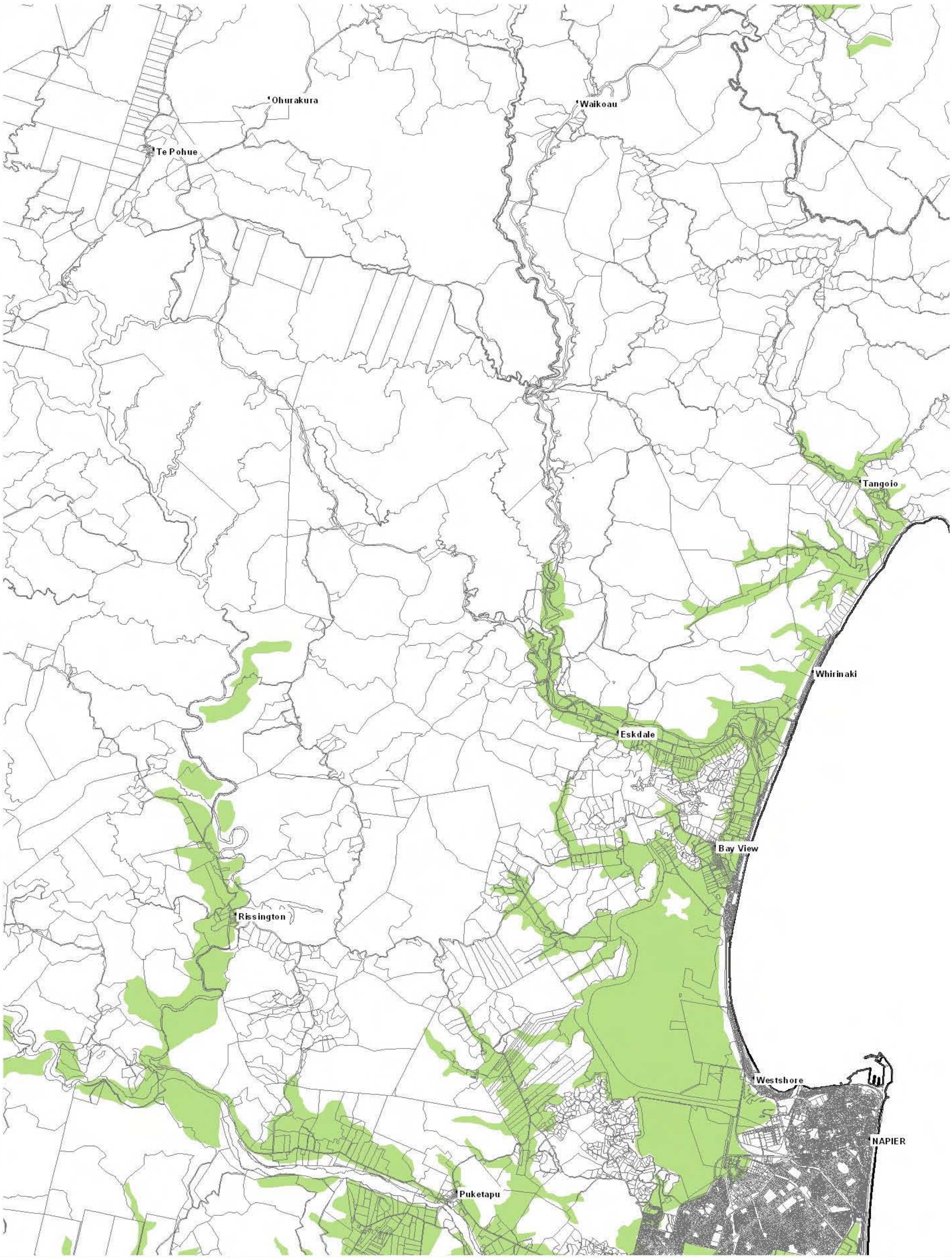

HAWKE'S BAY REGIONAL COUNCIL

RULE 7: Areas Excluded from Conditions (c)

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DATA FROM: Cadastral and topographic Information obtained from Land Information New Zealand.

HAWKE'S BAY
REGIONAL COUNCIL

RULE 7: Areas Excluded from Conditions (c)

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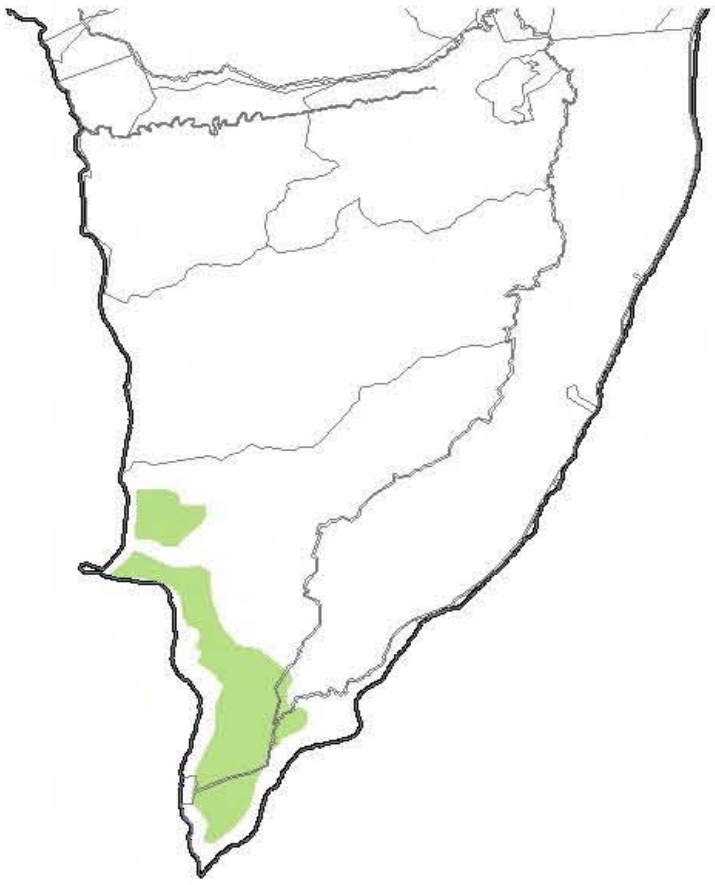

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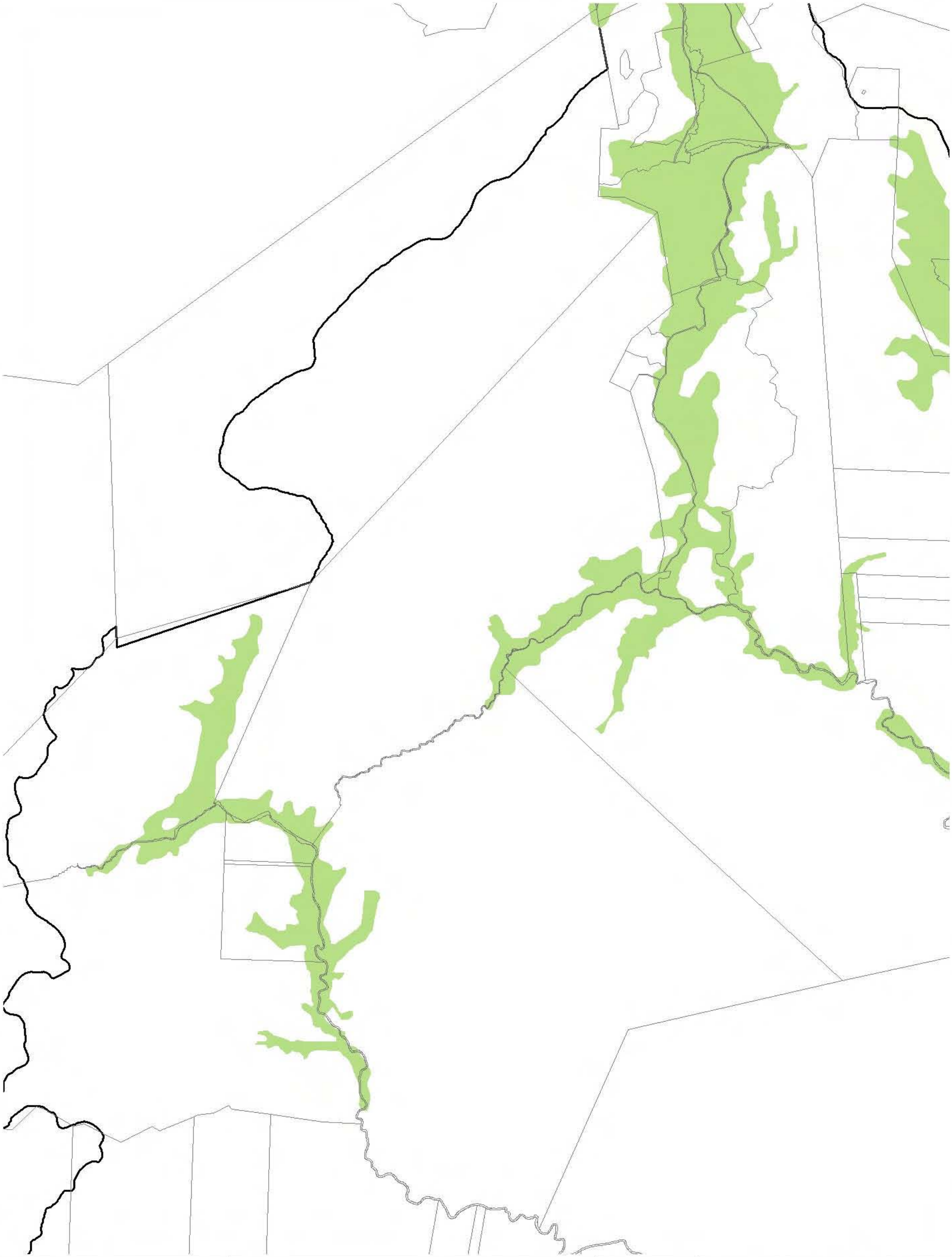

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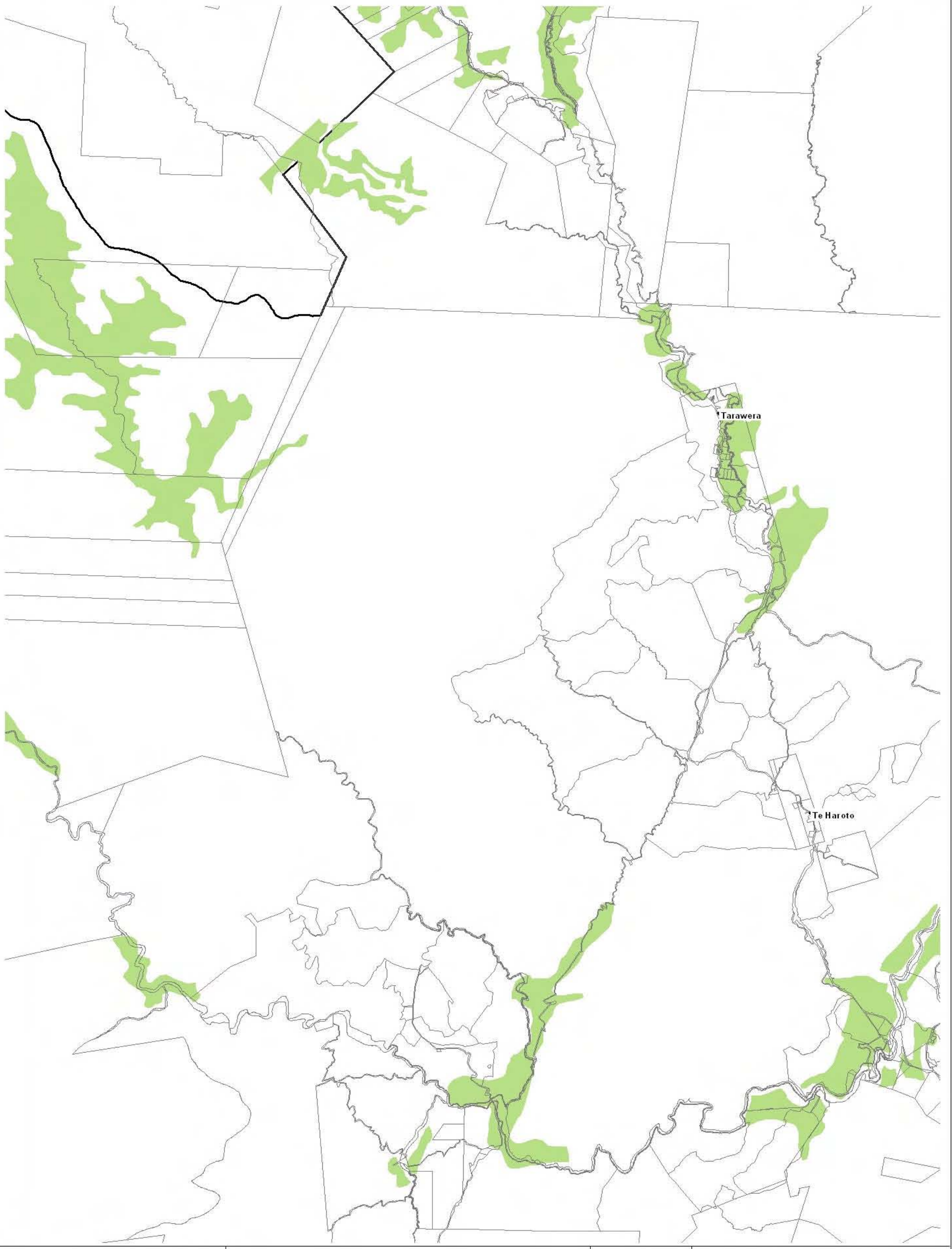

HAWKE'S BAY REGIONAL COUNCIL

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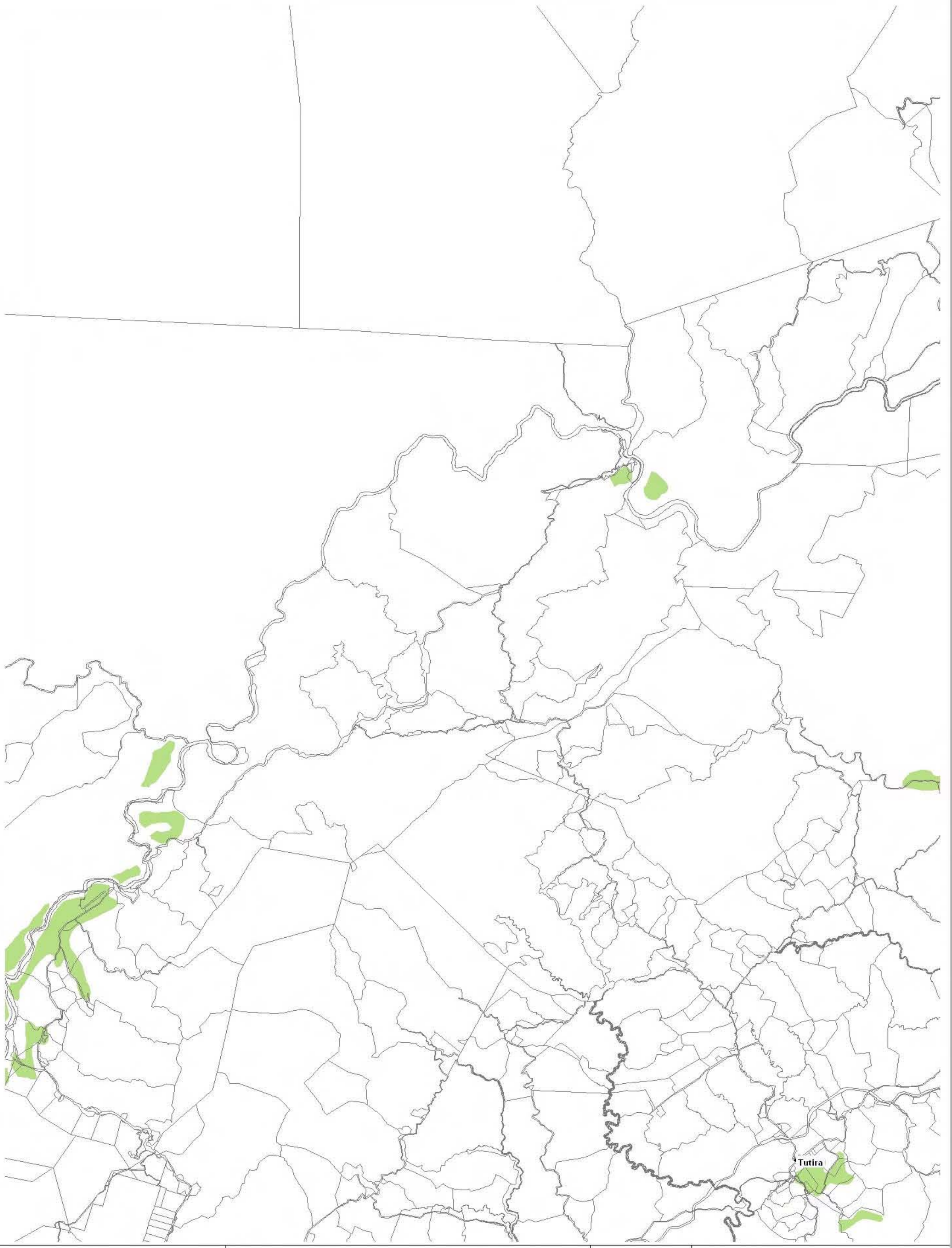

HAWKE'S BAY
REGIONAL COUNCIL

RULE 7: Areas Excluded from Conditions (c)

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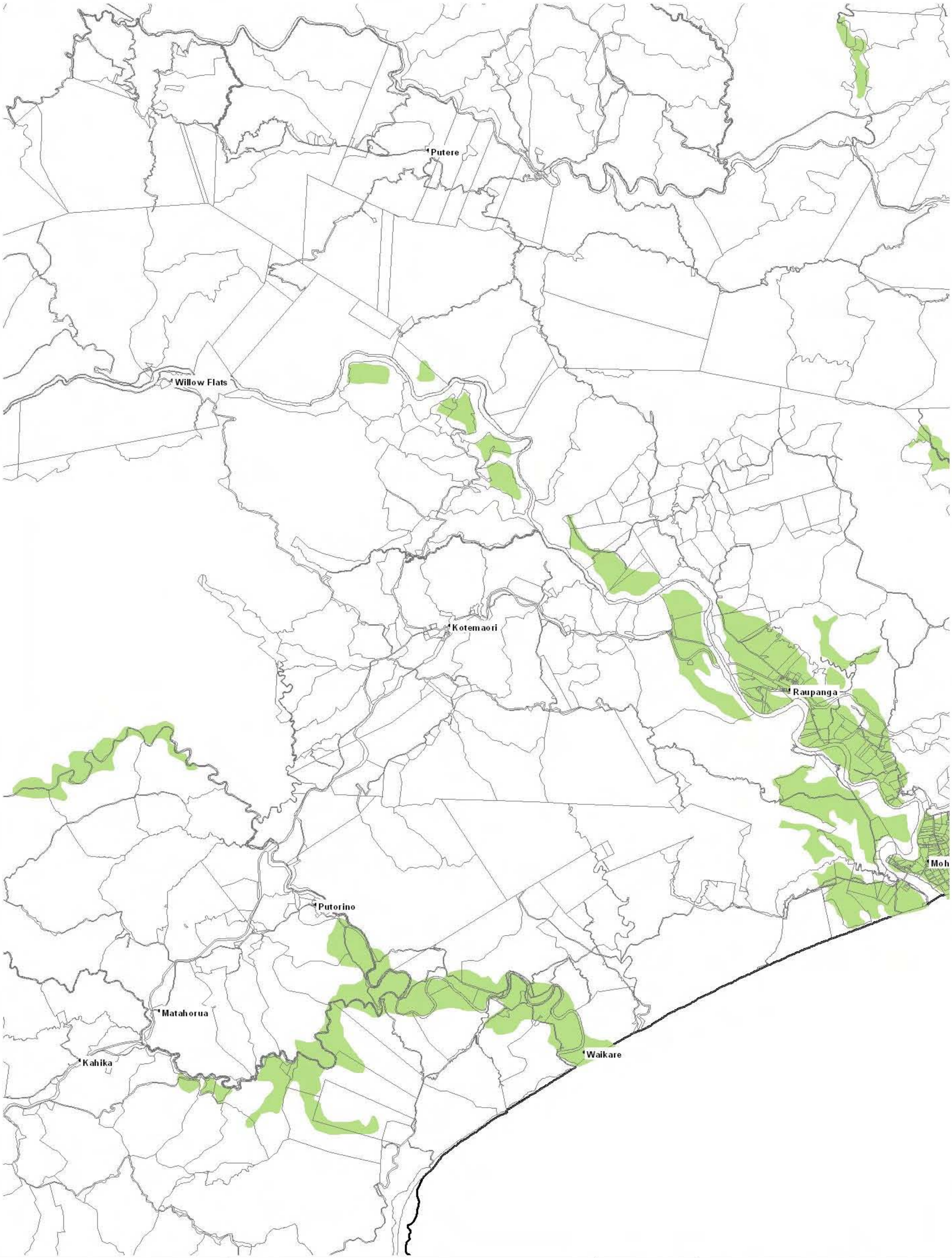

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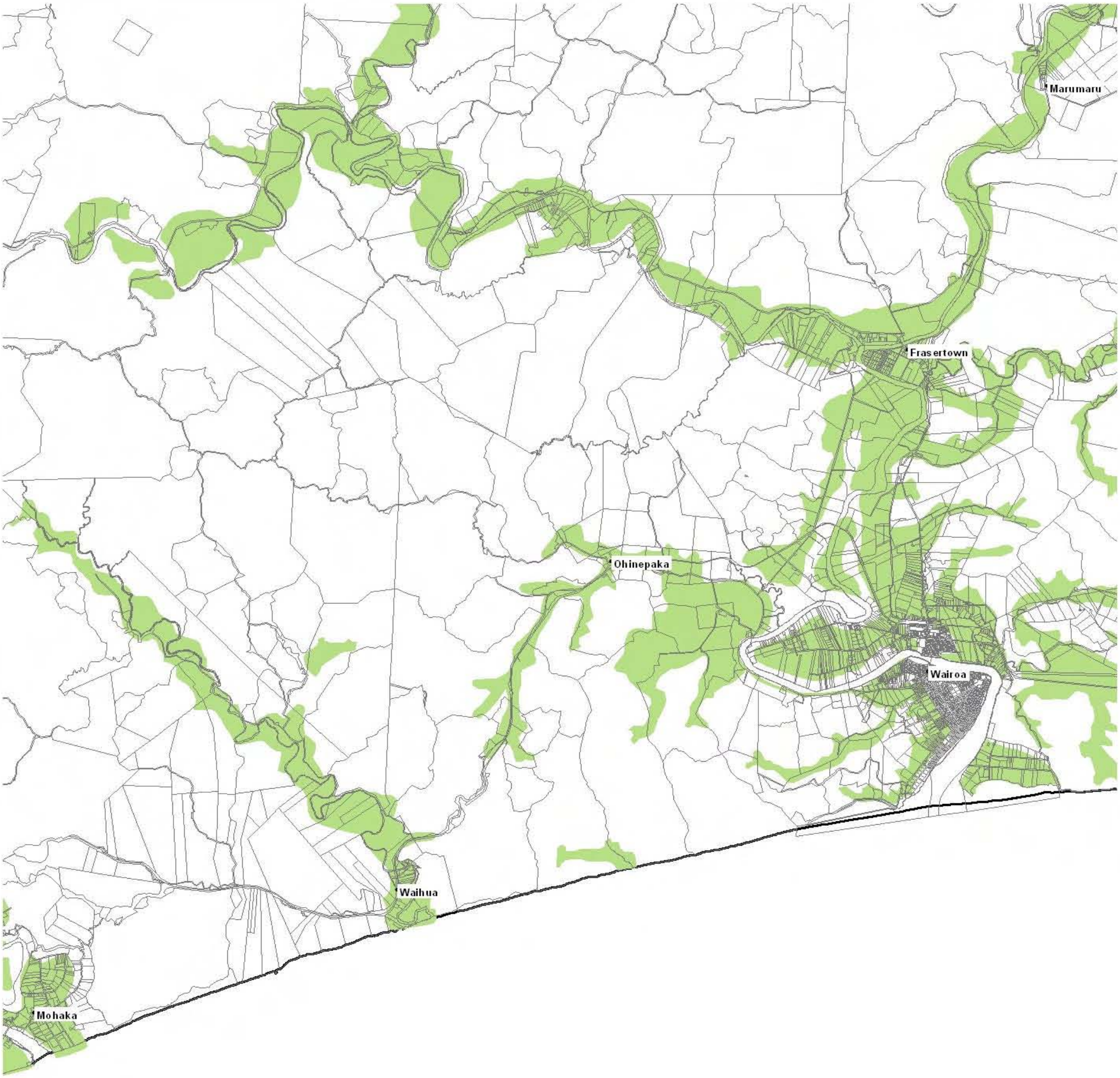

HAWKE'S BAY REGIONAL COUNCIL

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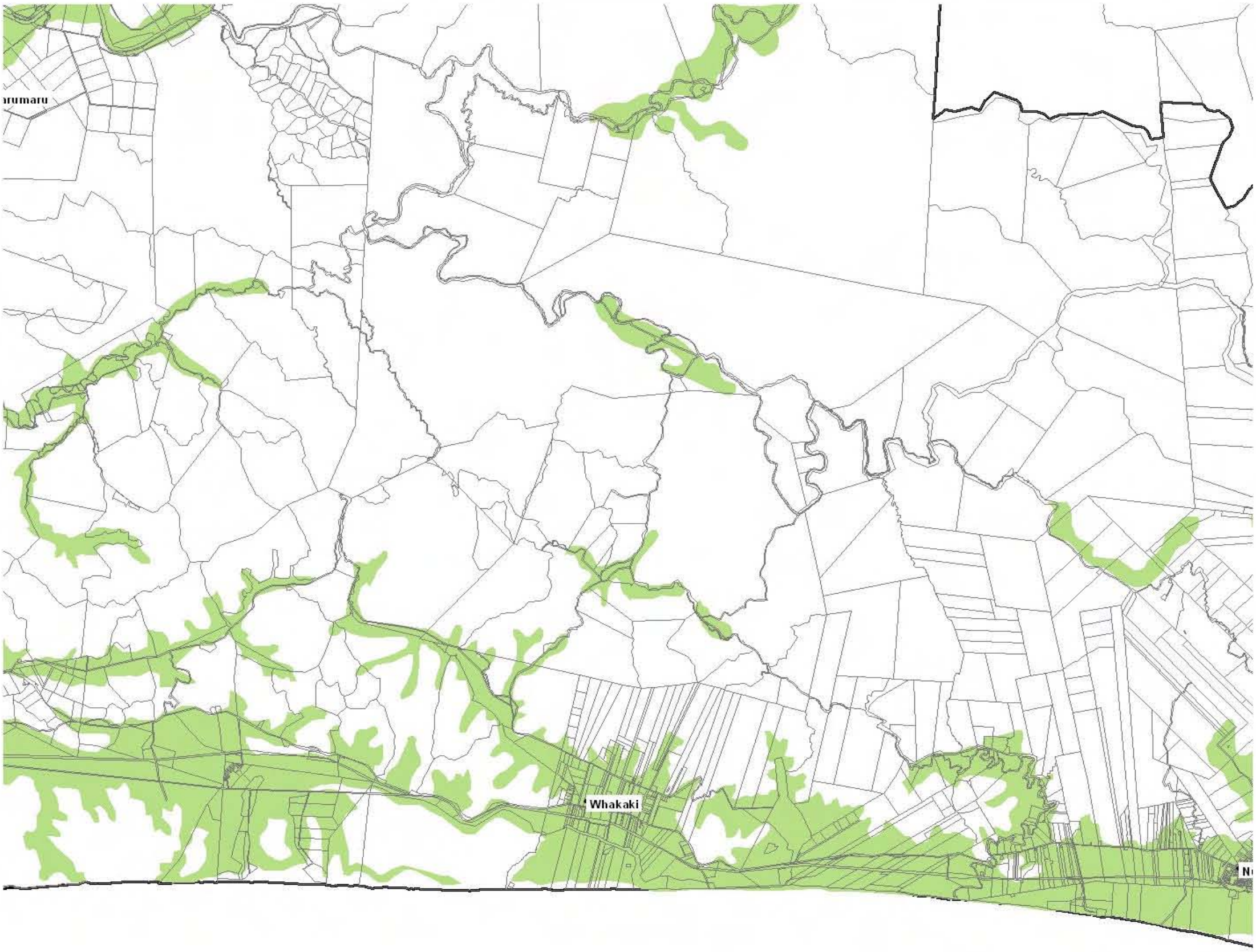

HAWKE'S BAY
REGIONAL COUNCIL

RULE 7: Areas Excluded from Conditions (c)

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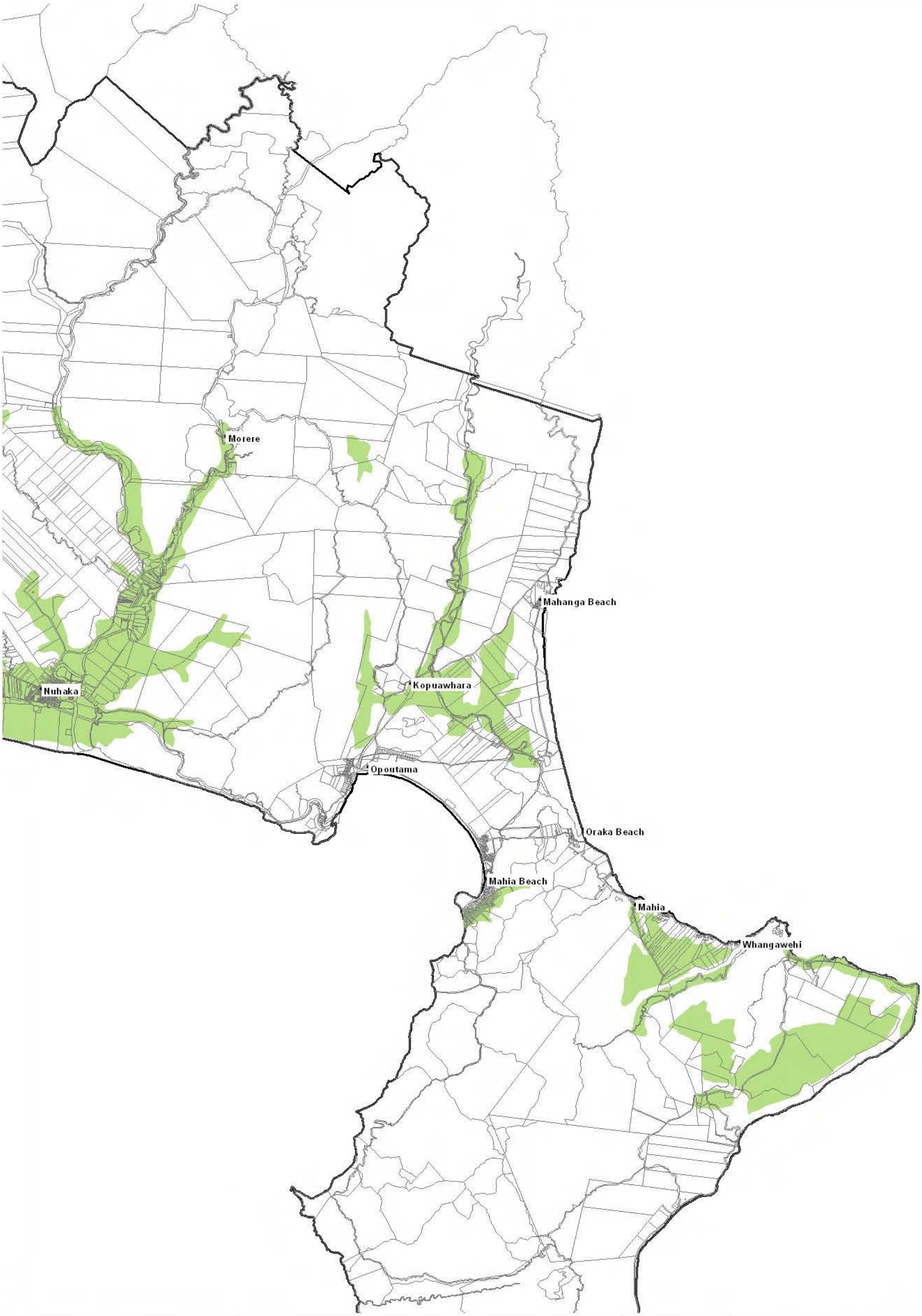

HAWKE'S BAY REGIONAL COUNCIL

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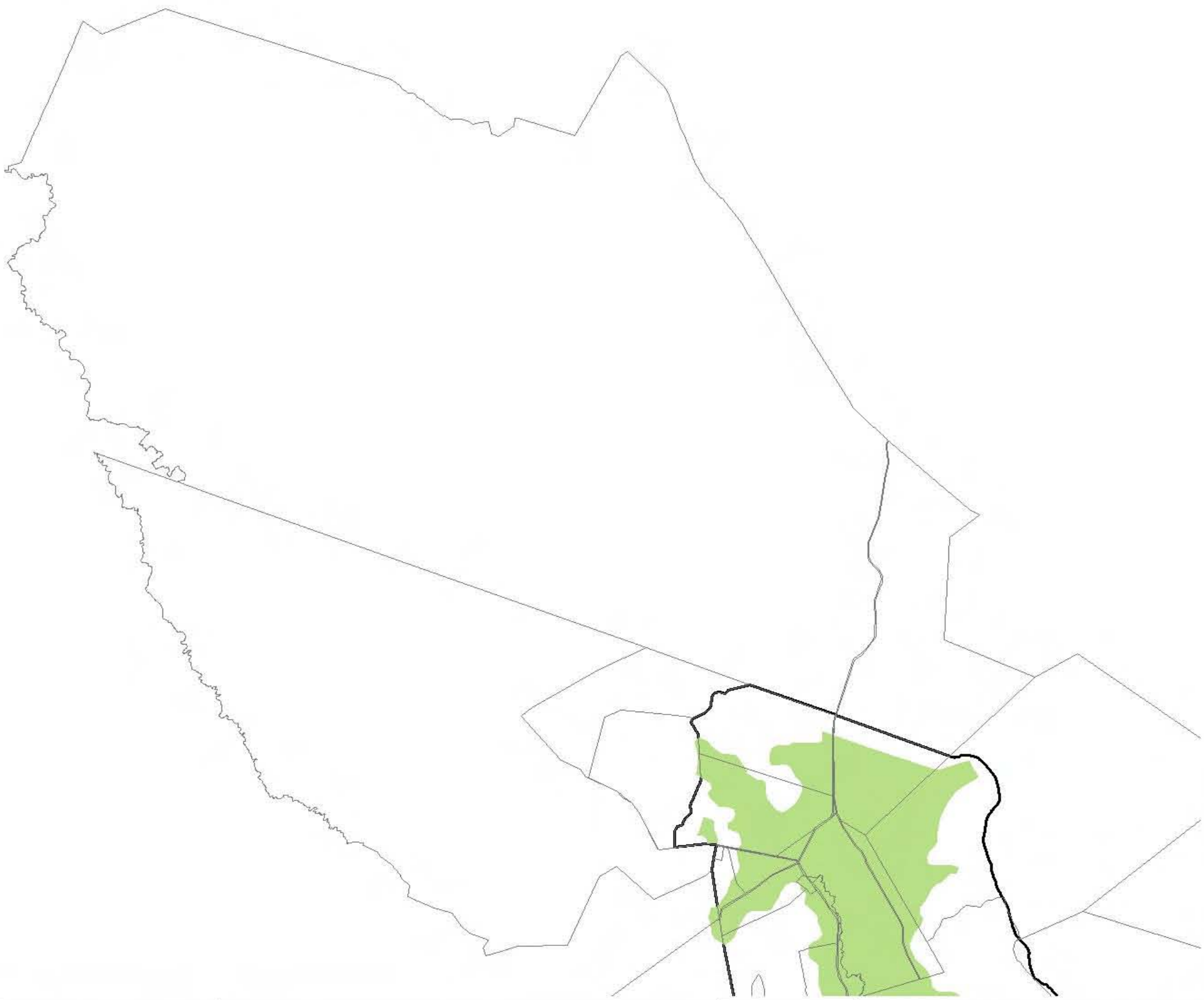

HAWKE'S BAY
REGIONAL COUNCIL

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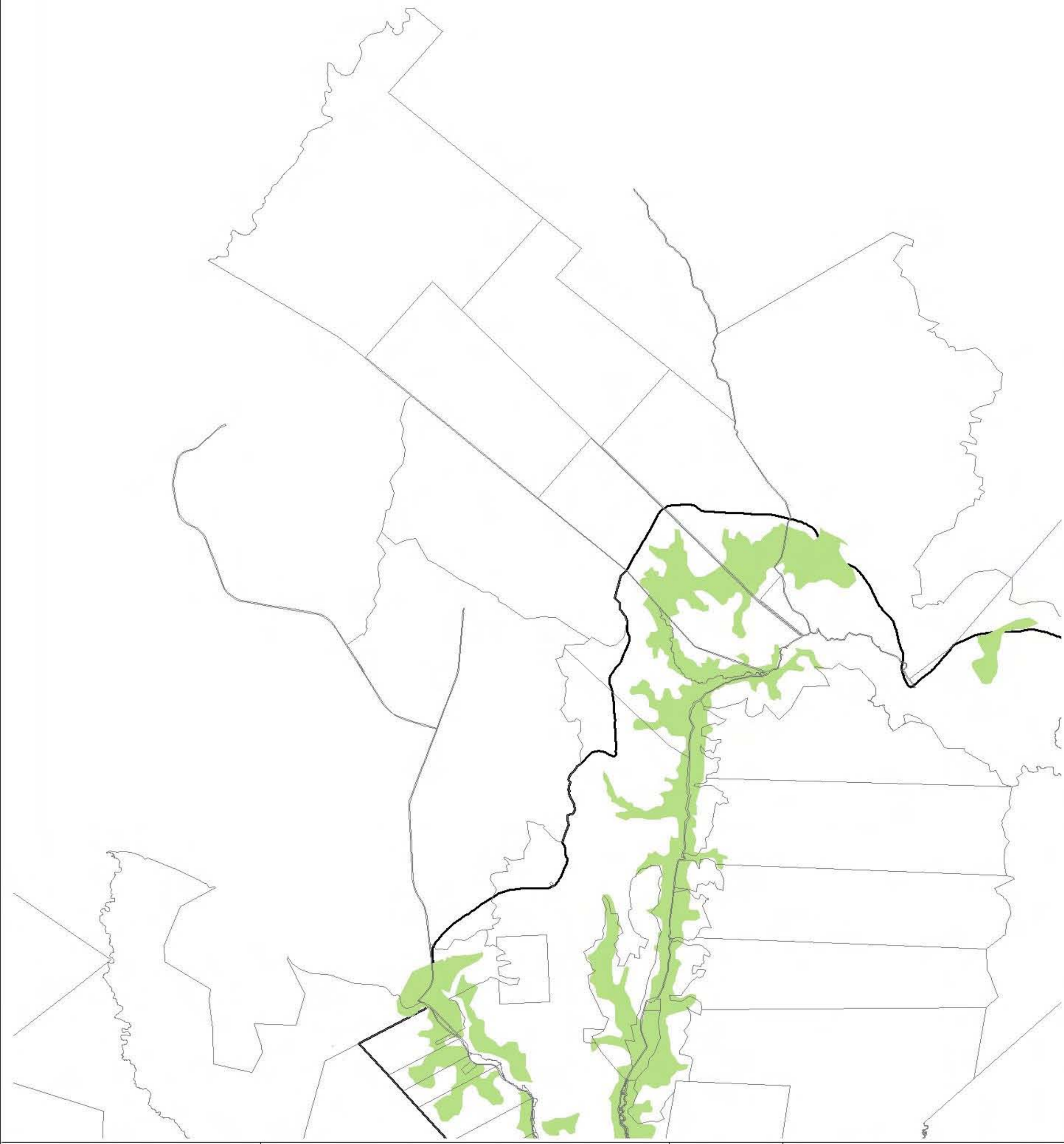

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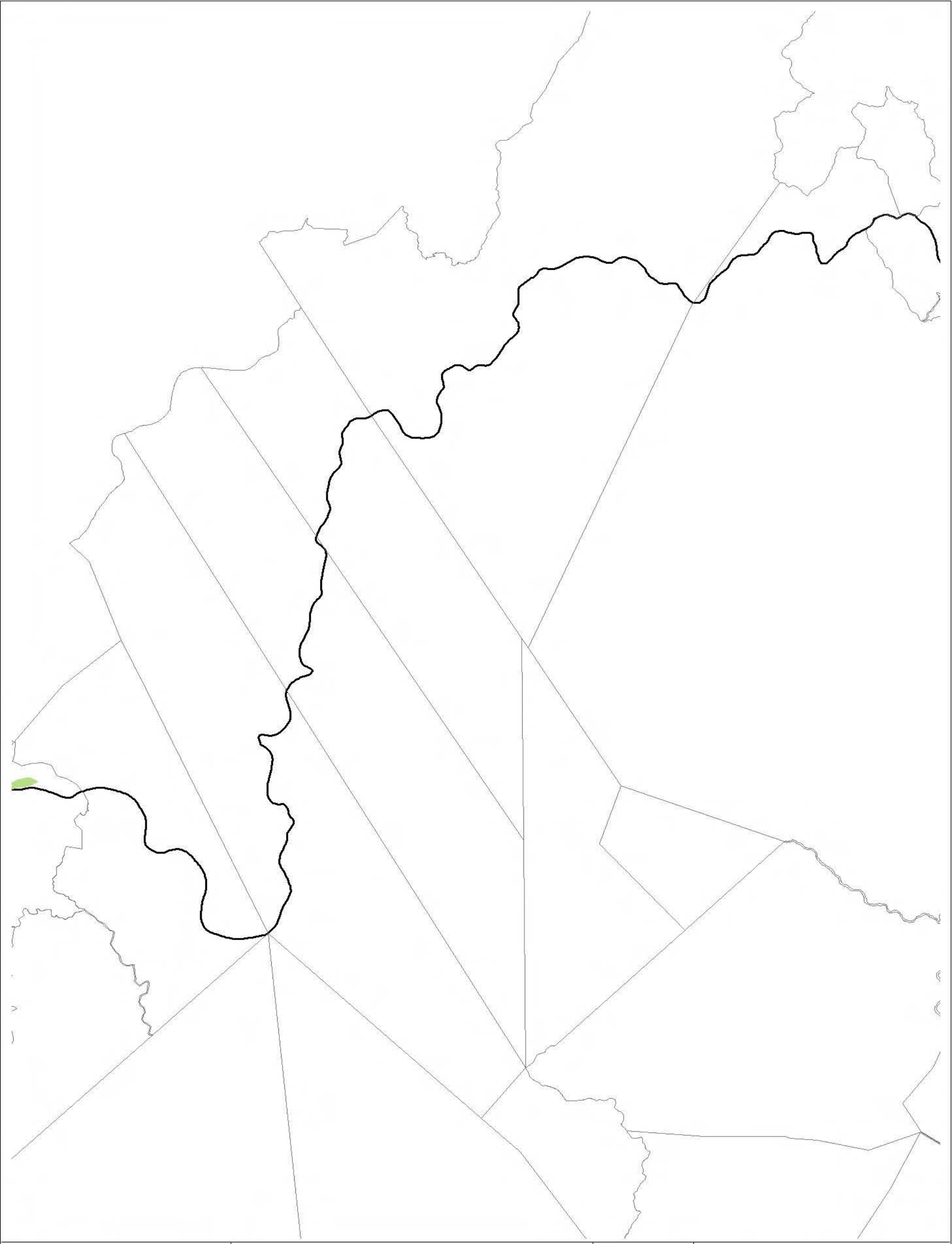

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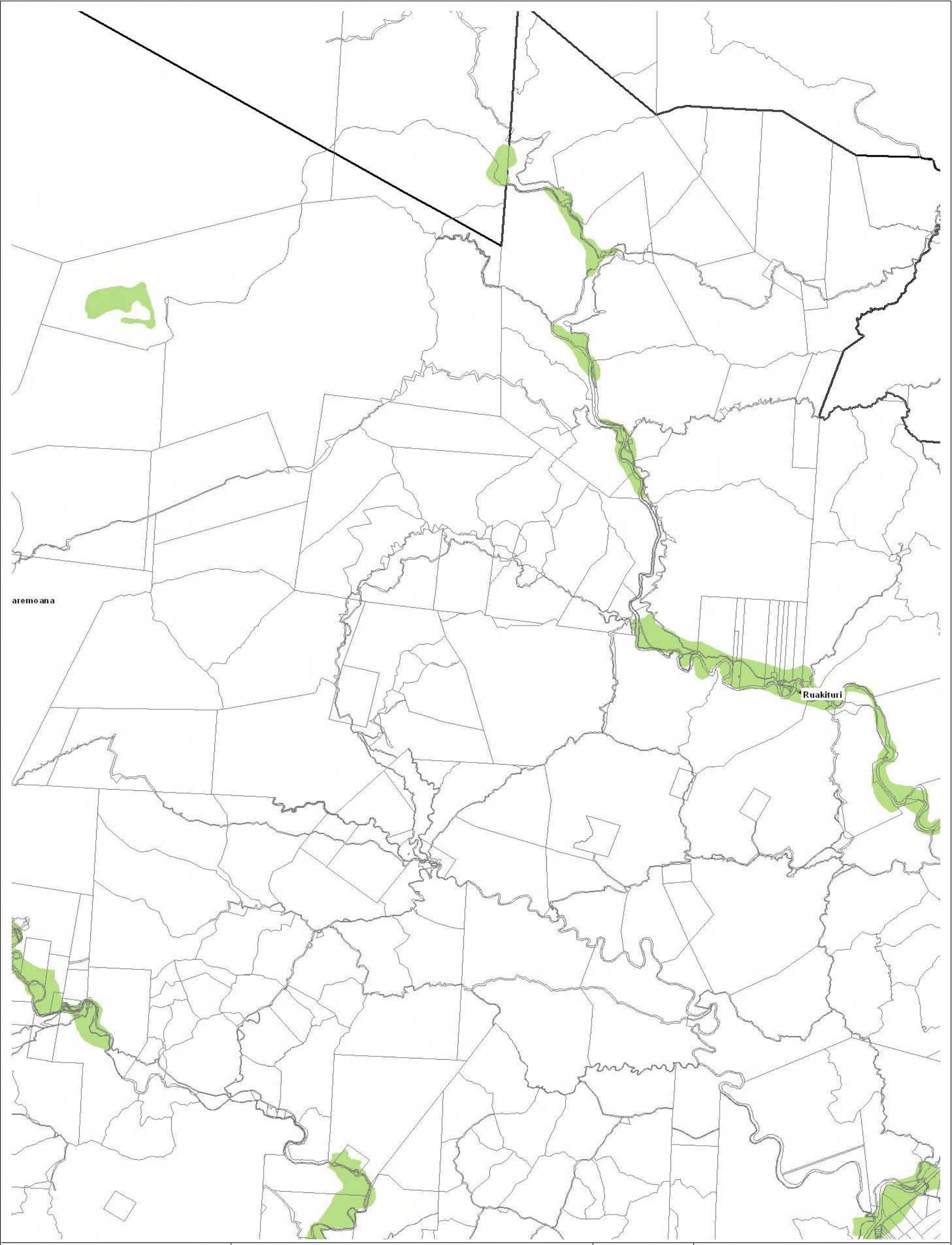

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