State of the Environment Report on Biodiversity 2011

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Executive Summary

The natural environment of the Whangarei District contains many and varied landscapes, providing a diverse range of habitats and promoting a high level of biodiversity. Habitats vary from the extensive lowlands of the Hikurangi Swamp, to some 270km of coastline, with the harbour supporting over 10,000 waterbirds, rolling pasture land, volcanic scoria cones supporting volcanic broadleaf forests and 17 major river catchments. Indigenous forest covers 22% of the district, and the district is also home to populations and breeding sites of North Island brown kiwi, Pateke (brown teal), Hochstetter's frog, and the New Zealand fairy tern. Whangarei District is also home to 220 regionally significant species such as the New Zealand scaup, kukupa (native wood pigeon), and banded kokopu. The natural environment plays an important role in defining the character of the district. It has been shown that one of the main reasons people move to Northland is the quality of the environment, and the main reason for staying, is again the environment. Development such as tourism, agriculture, forestry, fishing, aquaculture, and mining are all dependent upon sustained and managed natural resources like biodiversity. Thus, a sustainable economy is also dependent upon a sustainable natural environment.

However, the sustainability of our natural environment is under pressure from many threats facing biodiversity, including habitat destruction, introduced pests, weeds and pollution. There are 205 at risk and threatened species present within the district, all of which are under threat from pressures of one form or another. Between the 2002 and 2005 update of the New Zealand Threat Classification System, threatened and at risk species present within the district that were considered to have genuinely worsened in status were: grey duck (serious decline to nationally endangered), ornate skink (not threatened to gradual decline) and forest ringlet butterfly (gradual decline to serious decline). The district also contains 62,323ha (23%) of acutely and chronically threatened environments, meaning that less than 20% of indigenous vegetation remains in these areas. In the years from 1997 – 2002, 284ha (0.4%) of indigenous land cover such as fernland, grey scrub, broadleaved indigenous hardwoods, and manuka/kanuka was lost. Additionally, 16% of new lots created from 1996 – 2009, and 12% of land use consents were located or partly located within a significant natural area identified as part of the Protected Natural Areas Programme. Twenty-six percent of new lots and 25% of land use consents were granted within North Island brown kiwi habitat (1996 – 2009). Pressures such as these are contributing to biodiversity loss locally and nationally, as national and regional state of the environment reports indicate a continuing loss of biodiversity.

However, there have been some encouraging improvements as a result of intensive conservation programmes for some species. Average numbers of Pateke (brown teal) at Northland flock sites have increased from 2002 levels, North Island brown kiwi population is up 69% from 2001, and the number of breeding pairs of fairy terns has increased since 2004. In 2008/09, the Department of Conservation reported improved security for four acutely threatened species (New Zealand fairy tern, Pateke (brown teal), New Zealand dotterel, *Amborhytida tarangiensis*), two at risk species (Turbott's weevil, *Placostylus hongii*) and one chronically threatened species (North Island brown kiwi) within the Department's Whangarei Area. Additionally, the number and area of formal conservation covenants

are increasing each year as landowners choose or are encouraged to protect areas of native habitat. These increases will help to protect biodiversity on private land, and in general by preserving the habitats of indigenous species. Formally protected land for conservation purposes already comprises 24,698ha (9%) of the district, including public conservation land, district council reserves, QEII covenants, conservation covenants, Nga Whenua Rahui, and Fish and Game wetlands. In addition, there are numerous community initiatives in the district to protect biodiversity, including 25 landcare groups, eight coastcare groups and four weedbuster groups among many others. Many farmers and landowners are also undertaking valuable biodiversity conservation and enhancement initiatives on private land.

Despite encouraging results in some areas, the indicator data suggests that statutory objectives relating to indigenous biodiversity in the district such as 'protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna from inappropriate subdivision, use and development' are not entirely being met. In other cases, there is not enough information to assess whether objectives are being met. The Whangarei District Growth Strategy has identified biodiversity as a significant issue that will need to be managed over the next 30/50 years. Future development and population growth will continue to threaten biodiversity in the Whangarei District, making it harder and harder to achieve biodiversity objectives. While it is recognised that this growth is necessary, much can be done to reduce the impact on biodiversity, for instance by consolidating growth and intensifying development in already compromised areas.

In order to ensure that the objectives regarding biodiversity are achieved in future, a number of options are provided for future responses to pressures on biodiversity. A specific biodiversity strategy for the district could be beneficial to direct and prioritise management activities and day-to-day decisions affecting biodiversity in the district. Another possible response to a decline in indigenous biodiversity is establishing a policy and/or strategy for biodiversity improvements to be taken into account when taking esplanade reserves. There are provisions for acquiring esplanade reserves at development stage that are available to create riparian margins and ecological corridors. Riparian margins play an important role in providing habitat for indigenous biodiversity, and vegetation along riparian margins are often important linkages between habitats; they also promote public access.

Other response options include facilitating further restoration and enhancement of biodiversity, education, advocacy and collaboration methods, economic incentives and strengthening statutory provisions and methods for biodiversity protection and enhancement, particularly within the District Plan. This could include identifying significant areas of indigenous vegetation and significant habitats of indigenous species, and including policies and rules relating to protecting biodiversity within these areas. Particular attention will need to be directed towards ensuring the requirements of the National Policy Statement on Indigenous Biodiversity (when finalised) are incorporated into Council's planning documents and operational procedures. This could be assisted by the proposed biodiversity strategy for the Whangarei District.

1. Introduction

1.1 Why Monitor The State Of The Environment?

Under section 35(2) of the Resource Management Act 1991 (RMA), local authorities are required to monitor the state of the whole, or any part, of the environment of their region or district to an extent which is appropriate to enable the local authority to effectively carry out its functions under the Act. The approach adopted in this report is outlined in the Whangarei District Council Monitoring Strategy 2001.

A state of the environment report:

1. Provides baseline information on the state of the district's environment, particularly in regard to significant issues identified in the Whangarei District Plan.
2. Provides information on changing environmental conditions (and development pressures) over time, particularly in regard to significant issues identified in the District Plan.
3. Identifies new issues and significant trends occurring in the district which require responses through district planning processes.
4. Describes potential solutions to the environmental issues identified.

Baseline information about the state of the environment is essential for assessing what changes are occurring, and whether those changes are detrimental (both to ecosystem functions and human well being). Resource management and environmental policy directions can be instituted or reviewed accordingly.

Monitoring the state of the environment provides indications of the effectiveness of current strategies and policies by comparing results against baseline information. This report will establish some baselines by which future comparisons can be made.

The Ministry for the Environment describes state of the environment monitoring and reporting as encompassing systematic monitoring, gathering and analysis of environmental data, as well as the dissemination of reliable, scientifically based, and easily understood information about the condition (state) of the environment, the pressures on it, and the effectiveness of measures taken to correct any issues. The basic steps are as follows, and commentary has been added stating how the Whangarei District Council (WDC) has addressed these steps to date:

- *Regular standardised monitoring of the environment to detect environmental conditions and trends.* This is undertaken by Council in the form of annual Resource Consents and Complaints Monitoring Reports, as well as periodic State of the Environment reports.
- *Regular reporting of information to the public and other interested parties.* The annual Resource Consents and Complaints Monitoring Report, and the periodic State of the Environment reports, are made available to the public on the Council website. Stakeholders

such as the Northland Regional Council, the Department of Conservation and other territorial authorities in Northland are kept up-to-date through the Northland Regional Monitoring Forum (hosted by the Northland Regional Council), and the Biodiversity Northland Forum (hosted by the NZ Landcare Trust).

- *Regular publication of State of the Environment Reports.* This report is Council's second.
- *Compilation of a directory of sources of environmental information.* The Northland Regional Monitoring Forum, which includes the Kaipara and Far North District Councils, is currently compiling a database of information collected during monitoring by each of the organisations, including the metadata.

1.2 Approach Taken By This Report

State of the environment monitoring responsibilities of territorial authorities are more limited than those of regional authorities, who are the major functionaries in respect to comprehensive environmental monitoring. In particular, state of the environment monitoring at a district level has a more limited land based scope, with its primary focus being on land use activities and the effects of those activities on particular aspects of the environment.

Effective state of the environment monitoring for territorial authorities is focused on those aspects of resource management and environmental regulation where **outcomes can most clearly be linked to the responsibilities of territorial authorities.** In this way, overlap between regional councils and territorial authorities is reduced. Additionally, this overlap is also addressed by the Northland Regional Monitoring Forum, which facilitates dialogue between the regional and territorial authorities to ensure duplication of monitoring functions is avoided.

Consequently, this report focuses on terrestrial and freshwater biodiversity in the district. The state of biodiversity is of particular concern, as an independent review of the New Zealand Biodiversity Strategy highlighted the ongoing loss of rare and threatened biodiversity from private land, and the district has experienced significant growth and development over the last eight years. Several documents have been produced which examine the state of biodiversity nationally i.e. Environment New Zealand 2007(Ministry for the Environment, 2007), and regionally i.e. 2007 State of the Environment Report (Northland Regional Council, 2008), Towards a Strategic Direction for Biodiversity Enhancement (Mullooly, 2007), and Protected Natural Areas in Northland, and Care Standards for Protected Natural Areas (Wildland Consultants, 2008). However, there has been no in-depth analysis of the state of biodiversity within Whangarei District.

This report examines key indicators which are specified in the WDC Monitoring Strategy, and the role of the Council in terms of biodiversity management. The objectives, policies and rules of the District Plan effectively determine how and where development should take place, and how potential threats to the environment are minimised.

1.3 Indicators And State Of The Environment Reporting

An indicator is something that is measured regularly to show trends or sudden changes in the state of a system, population or individual (Ministry for the Environment, 1997). The power of an indicator lies in its ability to tell us how a specific condition is changing over time. The WDC Monitoring Strategy states that indicators need to be policy relevant, analytically valid, cost effective, simple and easily understood.

The Ministry for the Environment have two national environmental indicators for biodiversity:

1. Native land cover
    a. Area of land cover by Landcover Database (LCDB) class
    b. Area of native land covered by Land Environment New Zealand (LENZ) class
    c. Area of native land cover under legal protection

2. Indicator species

a.	Lesser short-tailed bat	*Absent from the district*
b.	Kiwi	Present in the district
c.	Kaka	*Absent from the district*
d.	Kokako	*Absent from the district*
e.	Yellowhead	*Absent from the district*
f.	Wrybill	Visitor to the district
g.	Dactylanthus	*Absent from the district*

Several of these indicators are not suitable for reporting within Whangarei District. Indicators 1a, b, c and 2b are analysed in detail in this report.

The Ministry for the Environment have four national environmental indicators for land:

1. Land cover
2. Land use
3. Soil health
4. Erosion risk

Indicators 1 and 2 are analysed in detail in this report as they relate to biodiversity.

The Monitoring Strategy also lists many indicators associated with state of the environment monitoring. This report only provides information and analysis on a selected set of these indicators, all of which are associated with biodiversity or indigenous ecosystems.

- *Indigenous vegetation and habitat*
- *Identified significant ecological areas (Protected Natural Areas)*
- *Covenanted areas (WDC, Queen Elizabeth II National Trust)*

- *Council and DoC Reserves*
- *Modification or loss of habitat*
- *Species distribution and trends*
- *Pest and weed invasion*
- *Number and function of landcare groups*
- *New Zealand Biodiversity Strategy (Ministry for the Environment, 2000), Northland Conservation Management Strategy (Department of Conservation, 1999), and the Northland Regional Pest Management Strategies (Northland Regional Council, 2010).*
- *Enhancement programmes*
- *Number and location of resource consents in relation to significant indigenous vegetation and threatened species*.

1.4 State Of The Environment Reporting And The Annual Resource Consents And Complaints Monitoring Reports

This State of the Environment Report on Biodiversity utilises information from the six annual Resource Consents and Complaints Monitoring Reports which have been produced by Council since 2002. These reports analysed trends in resource consents (both land use and subdivision), as well as esplanade reserves and conservation covenants. They also present images of spatial distribution of development and conservation measures.

2. Biodiversity

2.1 What Is Biodiversity?

In simple terms, biodiversity is the variety of living organisms, including plants, animals, fungi and micro-organisms. It also includes the diversity of ecosystems in which they live, on land, in water and the ocean. The Convention on Biological Diversity, signed by 190 countries at the 1992 United Nations Earth Summit in Rio de Janeiro, defined biodiversity as:

> *"The variability among living organisms from all sources, including, among other things, terrestrial, marine, and other aquatic ecosystems, and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems."*

In New Zealand, the RMA defines biological diversity as the variability among living organisms, and the ecological complexes of which they are a part, including diversity within species, between species and of ecosystems.

There are three sub-types of biodiversity: *Genetic diversity* is the variety of genes within a species. Genetic diversity is important in conservation biology. The higher the genetic diversity, the more resilient a species is to change (e.g. diseases, changes in climate), and it is thus more likely to survive. If a species becomes extinct, the genes that it carries become lost and the genetic diversity on earth diminishes. Genetic diversity is also important in crop production and security of supply. Over-reliance on only a few species for food leaves us vulnerable to changes affecting those species (e.g. Irish potato famine).

Species diversity is the number of different kinds of organisms within communities and ecosystems. It is the most obvious form of biodiversity and includes the range of species that we see and enjoy everyday. A high diversity of species contributes to healthy and functioning ecosystems by ensuring all niches and trophic levels are occupied.

Ecological diversity describes the complexity and variety within a biological community, including such things as the number of niches, trophic levels, and ecological processes sustaining that community. A highly diverse community is likely to support a range of processes that function to keep the environment working at a balance that benefits all members of its communities.

2.2 Why Protecting Biodiversity Is Important

Biodiversity is important to us all in some way. Internationally, New Zealand is regarded as a significant contributor to global biodiversity – a biodiversity 'hotspot'. A comparatively large proportion of our native species are endemic (they do not occur naturally anywhere else on earth). Therefore our indigenous biodiversity – our native species, their genetic diversity, and the habitats and ecosystems which support them – are of significant value, both nationally and internationally.

2.2.1 Legal Mandate

There are several statutory obligations for protecting and maintaining biodiversity in New Zealand. In other words, it is important to conserve biodiversity, because we are required by law to do so.

Resource Management Act (1991)

Territorial authorities have a specific function under s.31 of the RMA to establish, implement, and review objectives, policies, and methods to achieve integrated management of the effects of the use, development, or protection of land and associated natural and physical resources of the district (of which biodiversity is a part). They are also required to control any actual or potential effects of the use, development, or protection of land, including for the purpose of maintaining biological diversity.

In addition to these specific functions, there are also overarching philosophies incorporating the need to protect biodiversity. The overall purpose of the Act, is to promote the sustainable management of natural and physical resources (s.5). Biodiversity is inherent in the definition of natural and physical resources (land, water, air, soil, minerals, and energy, *all forms of plants and animals*), and sustainable management is further defined to include: sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations, safeguarding the life-supporting capacity of air, water, soil, and ecosystems and avoiding, remedying, or mitigating any adverse effects of activities on the environment.

The Act also outlines matters of national importance in s.6, including the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development; the protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development and the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna. These all include elements of biodiversity.

Section 7 directs all persons exercising functions and powers under the Act (including territorial authorities) to have particular regard to the maintenance and enhancement of amenity values, the intrinsic values of ecosystems, the maintenance and enhancement of the quality of the environment, and any finite characteristics of natural and physical resources, among other things.

New Zealand Biodiversity Strategy

New Zealand is a signatory to the United Nations Convention on Biological Diversity (CBD). In order to ratify the CBD New Zealand was obliged to prepare a national biodiversity strategy (The New Zealand Biodiversity Strategy). This was completed in February 2000.

The New Zealand Biodiversity Strategy (Ministry for the Environment, 2000) established a framework for the conservation and management of New Zealand's biodiversity. It contains a series of action plans and desired outcomes which need to be achieved by 2020.

The Strategy contains four goals:

Goal 1: Community and individual action, responsibility and benefits:

"Enhance community and individual understanding about biodiversity, and inform, motivate, and support widespread and co-ordinated community action to conserve and sustainably use biodiversity."

"Enable communities and individuals to equitably share responsibility for, and benefits from, conserving and sustainably using New Zealand's biodiversity, including the benefits from the use of indigenous genetic resources."

Goal 2: Treaty of Waitangi:

"Actively protect iwi and hapu interests in indigenous biodiversity, and build and strengthen partnerships between government agencies and iwi and hapu in conserving and sustainably using indigenous biodiversity."

Goal 3: Halt the decline in New Zealand's indigenous biodiversity:

"Maintain and restore a full range of remaining natural habitats and ecosystems to a healthy functioning state, enhance critical scarce habitats, and sustain the more modified ecosystems in production and urban environments; and do what else is necessary to maintain and restore viable populations of all indigenous species and subspecies across their natural range and maintain their genetic diversity."

Goal 4: Genetic resources of introduced species:

"Maintain the genetic resources of introduced species that are important for economic, biological and cultural reasons by conserving their genetic diversity."

Setting aside places where native ecosystems and species can function and evolve with little interference or disturbance is a key mechanism for contributing to Goal 3.

An independent review "Turning the Tide?" examined the progress which had been made during the first five years of the Strategy (Green and Clarkson, 2005). It identified that, while a number of building blocks had been put in place, other building blocks were still required, most notably; an Oceans Policy, a National Policy Statement on biodiversity, indicators for biodiversity and biosecurity linked to regional and national monitoring and reporting systems, a comprehensive state of the environment reporting system, and a collaborative strategy to manage New Zealand's genetic resources. It recommended the addition of one new objective – consideration of the impacts of climate change on biodiversity and the implications for adaptation responses.

The Biodiversity Package Funds, associated with the Strategy, were considered to have significantly strengthened existing initiatives, but the following trends required more attention; ongoing loss of rare and threatened biodiversity from private land, dominance of economic drivers which favour the degradation of ecosystems rather than their active maintenance, adverse impacts of animal pests on threatened species and forest ecosystems, serious declines in the status of many acutely or chronically threatened species, continuing spread of pest fish, aquatic weeds and growing numbers of weed species, and negative impacts of fishing on many marine habitats and ecosystem processes.

The review recommended:

- Utilising a framework which considered the mix of biodiversity values and set the level of management needed to achieve particular thresholds of restoration and protection.
- The involvement of local government agencies, communities and private interest groups because important indigenous biodiversity values occur on private land.
- Integration with central government agencies. The inter-dependence of the public and private sectors, central and regional government in achieving biodiversity goals needed to be more firmly embedded.
- Using the existing building blocks, completing the remaining building blocks and applying them to new strategic linkages.
- Collaborative partnerships. New statutory requirements for environmental reporting by local authorities had arisen under the Local Government Act 2002 and the 2004 amendments to the RMA.
- Finalisation of a comprehensive system of environmental indicators and performance standards followed by monitoring and reporting systems. These are needed by local and central government agencies to assess the effectiveness of management, and evaluate policies and allocation of resources.
- Setting quantifiable targets to cover 5, 10 and 15 year periods.

Statement of National Priorities for Biodiversity Protection

The Statement of National Priorities for protecting rare and threatened native biodiversity on private land was published by the Ministry for the Environment in 2007. Much of our rare and threatened native biodiversity is found on private land. The national priorities in the statement identify the types of ecosystems and habitats most in need of protection. Four national priorities have been set:

1. To protect indigenous vegetation associated with land environments that have *20% or less remaining in indigenous cover.*
2. To protect indigenous vegetation associated with *sand dunes and wetlands*; ecosystem types that have become uncommon due to human activity.
3. To protect indigenous vegetation associated with '*originally rare*' terrestrial ecosystem types not already covered by priorities 1 and 2.
4. To protect *habitats of* acutely and chronically threatened *indigenous species*.

Proposed National Policy Statement on Biodiversity

The proposed national policy statement on indigenous biodiversity was released for comment on the 29th January 2011, in response to the decline of New Zealand's native biodiversity. It aims to set a national baseline for identifying areas of significant indigenous vegetation, significant habitats of indigenous fauna, and require that these areas be taken into account in resource management planning, including the processing of resource consents.

There are a range of other benefits of, and reasons for, protecting biodiversity and the ecosystems comprised of diverse biological life.

2.2.2 Economic Benefits

Nature provides a range of benefits, including resources and services. The services provided by ecosystem functions are commonly termed 'ecosystem services' and include production of raw materials, (food and fibre), water and air purification, nutrient cycling, waste decomposition, pollination, production of healthy soils, climate regulation, flood attenuation and much more. Currently these services are free – they are predominantly public goods, with no prices. Because of this, we tend to take the services for granted, and they are often not taken into account as economic benefits. The cost of providing these services ourselves would be vast, and their provision not nearly as effective as natural processes, if possible at all.

The natural environment and biodiversity values are also a significant attractant to visitors and contribute to the economy through tourism. Research by Statistics New Zealand shows that one of the main reasons people move to Northland is the quality of the environment, and the main reason for staying, is again the environment. Tourism, including eco-tourism is an important contributor to the local economy, thus preserving the main reason people visit is vital to the industry and the economy.

2.2.3 Social Benefits

High biodiversity in New Zealand contributes to our distinctive national identity. We identify with our renowned natural places and species, and value them because they make New Zealand what it is. Nationally, and locally the species and environments we have become accustomed to contribute to a strong sense of place – an affiliation with the land, formed by our knowledge and experience of it.

Natural environments are also valued for their aesthetic and recreational benefits. Natural landscapes and wildlife are valued for their beauty and they provide a setting in which we can live and play. Many recreational activities are based on the natural environment, and species it contains – camping, hiking, wildlife watching and so forth. These natural areas can also promote physical health by enhancing and promoting opportunities for physical activity, and psychological health by providing plentiful, high quality open space.

Biodiversity is also important for research, including investigating pharmaceutical uses, synthetically mimicking natural materials, and understanding natural processes and interactions for our benefit e.g. biocontrol.

2.2.4 Cultural Benefits

In Maori culture, nature carries spiritual connotations, and particular species can be affiliated with identify and meaning. Natural materials are also important for traditional medicines, traditions and

customary uses. Thus, it is important to conserve biodiversity and in doing so, help preserve a culture. The kiwi is also a symbol of cultural identity to all New Zealanders ('Kiwis').

2.2.5 Intrinsic Values

To many people, biodiversity also has an 'intrinsic value'; they value it simply because it is there and it is not seen as something inherently useful to humans. Embedded in this view, is a responsibility to ensure that subsequent generations enjoy the same or higher level of biodiversity as we do.

2.3 Threats To Biodiversity

On both global and local scales, there are several major processes threatening the state of biodiversity today. Six major processes threatening biodiversity were identified by Kingsford et al. 2009: habitat loss and degradation, invasive species, over-exploitation, pollution, climate change, and disease. These processes do not necessarily exist in isolation, and several can be associated with a single activity, for example, urbanisation. Other factors exacerbating these threats include stochastic (random) catastrophic disturbances (e.g. fire and flood), and small population sizes and restricted distributions.

2.3.1 Habitat Loss And Fragmentation

This is often described as the main reason for the current global species decline and extinctions; it affects more terrestrial species than any other process (Kingsford et al. 2009). Habitat damage, especially the conversion of forested land or wetland areas to agriculture (and, often, subsequent abandonment as marginal land) and urban areas, has a long human history and continues today. In New Zealand, by 1600 more than one third of original forest cover was gone; following European habitation half of the remaining forest was converted to farmland. Today, just 23% of indigenous forest-cover remains (www.biodiversity.govt.nz). Habitat fragmentation divides populations into isolated groups that become more vulnerable to change and catastrophic events.

2.3.2 Invasive Species

In New Zealand, a particularly devastating cause of species decline has been the introduction of exotic species. Without the natural predators, parasites, pathogens and competition that kept them in check in their native home, certain species can turn into invaders – pests and weeds - in a new habitat. Invasive species, particularly vertebrates and vascular plants have devastated terrestrial species of Pacific Islands, including New Zealand, and caused 75% of all terrestrial vertebrate extinctions on oceanic islands. Many invasive weeds, vertebrate pests, and fishes were introduced by governments, horticulturalists, and hunters (Kingsford et al., 2009).

Plants

A weed is a plant growing where it is not wanted and having a harmful impact (www.weedbusters.org.nz). Environmental weeds invade native vegetation and are harmful to biodiversity and/or ecosystem functions. Freshwater, wetlands, coastal habitats, lowland forest, shrubland and native grassland are all particularly vulnerable. Weeds threaten the long-term survival

of some native animals by changing or destroying their habitat, reducing the availability of food or breeding sites, or influencing the way native and introduced animals behave.

There are now more introduced plant species growing wild in New Zealand than native plant species. Over 75% of environmental weeds were originally deliberately introduced to New Zealand as garden plants. Introduced plant species continue to naturalise at an alarming rate. New weed seeds come into New Zealand on imported fresh fruit, used cars, boots, camping equipment, and in soil on and around containers. People bring in new plants which escape, rubbish is dumped in reserves, and the expansion of coastal subdivisions and lifestyle blocks exacerbate the spread.

A consolidated list of environmental weeds published by the Department of Conservation lists 328 vascular plants species which cause environmental damage (Howell, 2008). The Northland Regional Council Regional Pest Management Strategy contains a list of weeds which are of particular concern for the Northland Region (see Appendix A). There are also weed species that are banned from sale, propagation and distribution under the National Pest Plant Accord (see Appendix B).

Animals

Animal pests are a major threat to New Zealand's biodiversity. They act as predators, browsers, and competitors of native species (King, C. 2005). A number of pest animal species are found within Whangarei District, including possums, deer, goats, wild pigs, mustelids (main predators of juvenile kiwi), rats, mice, hedgehogs and more (Appendix C). There are some recognised pests not present so far in the district, including feral cattle, feral sheep, wallaby, Himalayan Tahr, chamois, sambar deer, rusa deer and white-tailed deer.

2.3.3 Over-exploitation

Overharvesting is another major threat to biodiversity. Some species are valuable as resource for food, or fibre etc. Fish stocks have been particularly susceptible to overharvesting in the past e.g. orange roughy, and some are still suffering today. Commercial fishing threatens the survival of long-finned eel in New Zealand. As a result of overfishing the number of juveniles arriving at our streams from where they spawn in the ocean has dropped by 75%, and the average size of eels captured has dropped every year since commercial fishing began. Currently the population is unable to replenish itself. Long-finned eel breed only once at the end of a very long life. In New Zealand human predation puts pressure on species already threatened, and can result in local extinctions. Threatened species such as kea, kukupa and kuaka are killed for food, sport, and because they are a nuisance to land managers. Some threatened species such as Pateke (brown teal) are killed accidentally i.e. during the duck shooting season. Illegal harvesting also affects many ecosystems and species, although the full impacts are not well known. Native animals, particularly birds and reptiles, are collected for the international wildlife trade. Native plant populations are under threat from harvesting for the pharmaceutical industry, private botanical collections, and commercial nurseries.

Even when species are able to recover from over-harvesting, the genetic implications of this may be such that they will never fully recover. Over-harvesting can lower genetic diversity and leave populations vulnerable to environmental changes and diseases. If populations get very low, then genetic complications may mean that mutations and genetic defects are not masked, as remaining genes are too similar, placing long-term viability of the species at risk.

2.3.4 Pollution

Pollution is the release of contaminants into the environment causing instability, disorder, harm or discomfort to an ecosystem i.e. physical systems or living organisms. It can be caused by chemical substances or energy i.e. noise, heat, light. Human activity can result in pollution on a local and a global scale i.e. global warming, acid rain. Rapid development and population growth increase the level of impact. There are seven main types of pollution.

Table 1: Causes Of Pollution.

Type of Pollution	Cause
Water	Sewage, fertilizer, toxic chemicals, oil
Soil	Pesticides, waste, herbicides, heavy metals, toxic chemicals
Air	Smoke i.e. fires, gas i.e. vehicles and industry, chemical particulates i.e. spraying
Noise	Road ways, aircraft, factories
Light	Over illumination
Visual	Structures i.e. billboards, power lines, scarred landforms, open storage of waste
Thermal	Temperature change in natural water bodies caused by human influence

Pollution can affect up to 20% of terrestrial species (Kingsford et al. 2009). Detrimental effects include; disruption to the food web, increase in abundance and distribution of invasive species, eutrophication of waterways, spread of disease, and direct death of threatened species i.e. poisoning.

2.3.5 Climate Change

The prevailing climate exerts major influences over the distribution of species (Pearson & Dawson 2003), at various time scales. Therefore any change to 'normal' climatic conditions will have an influence on local species survival, either increasing or decreasing opportunities, which, in turn, can affect the functioning of a local ecosystem. Most of the literature, whilst recognising some benefits for agricultural species in some locations, tends to see climate change as having a negative impact on global biodiversity. This is possibly due, in part, to the notion that biodiversity is already in decline in many parts of the world, and climate change is likely to exacerbate this decline (Whangarei District Council, 2010). Figure 1 illustrates the broad impacts of climate change on biodiversity.

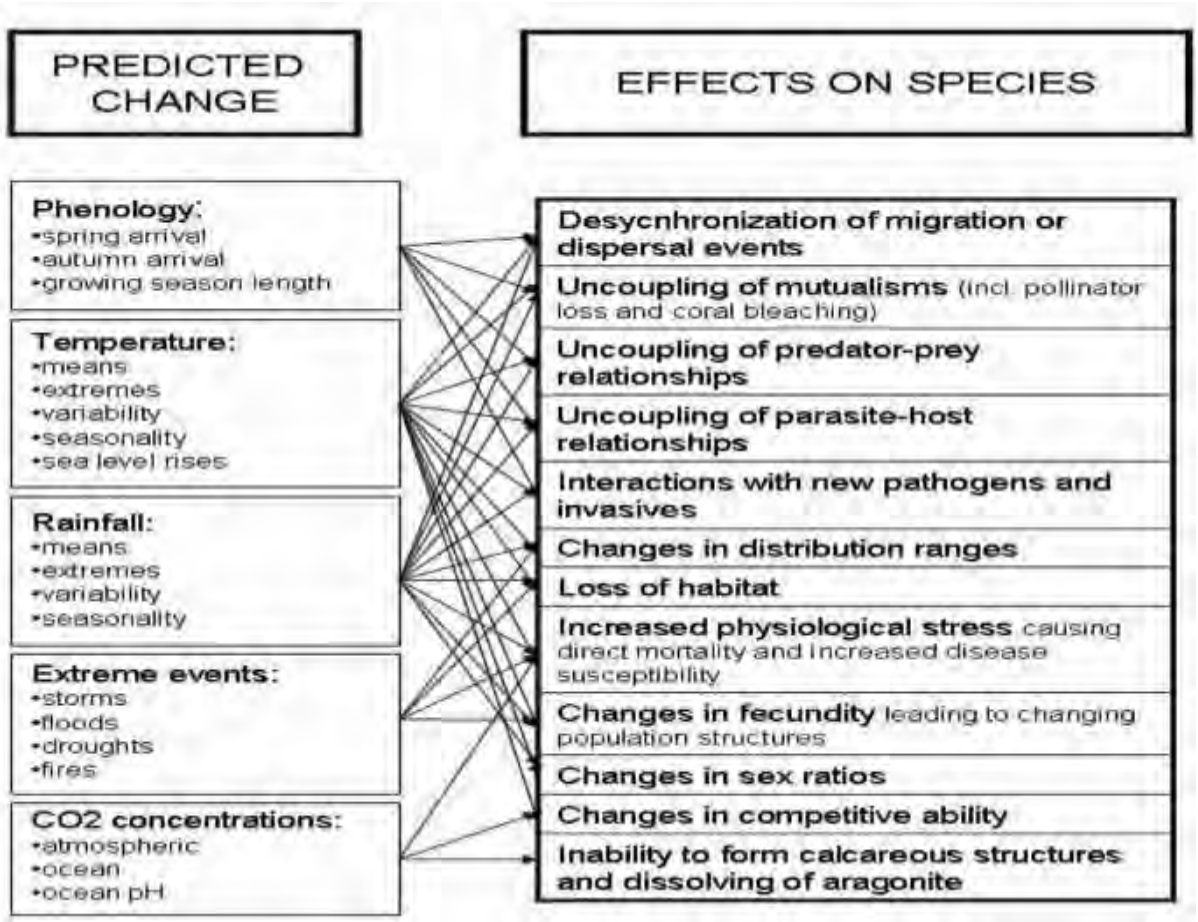

Figure 1: Broad Potential Impacts Of Climate Change On Biodiversity. Sourced from Foden et. al., (2008).

2.3.6 Spread Of Disease

Wildlife diseases and parasites pose a substantial threat to the conservation of biodiversity. They have the potential to cause catastrophic rapid population decline, and initial declines may be followed by chronic population depression, and local extinction can occur. The impact of pathogen pollution may be augmented by secondary or "knock-on" effects that are difficult to predict i.e. decrease in populations of other species in the food chain, prey switching, and vegetation/habitat changes. Internationally, frogs are declining or extinct due to the infectious disease Chytridiomycosis. The microscopic fungus-like plant pathogen *Phytophthora* taxon Agathis severely damages, and kills, kauri trees and seedlings of all ages. Diseases and parasites can be contracted from domestic animals living in proximity, directly as a result of human intervention i.e. host or parasite translocations, and even without obvious human or domestic animal involvement.

2.3.7 Stochastic Catastrophic Disturbances

Stochastic catastrophic disturbances can affect individual species and whole ecosystems. Several factors can occur simultaneously or in succession, and the impact on biodiversity values can be temporary or permanent.

Table 2: Environmental Perturbations And Their Impact On Biodiversity.

Environmental Perturbation	Impact on Biodiversity
Fire	Death of individuals, local extinctions. Increased vulnerability to predation. Habitat loss and degradation. Change in the composition of indigenous plant communities. Increased risk of pest plants establishing aided by a temporary pulse in soil nutrients. Change in hydrology i.e. water quality and quantity.
Land slide /erosion	Habitat loss and degradation. Change in hydrology i.e. desiccation, reduced water quality. Increased risk of pest plants establishing at the disturbed site. Increased risk of further events due to soil or geological instability.
Earthquake Associated tsunami	Death of individuals, local extinctions. Habitat loss and degradation. Pollution from debris and waste. Water contamination.
Drought	Death of individuals, local extinctions. Increased vulnerability to predation. Habitat loss and degradation. Change in the composition of indigenous plant communities. Change in hydrology i.e. desertification, increased salinity. Soil degradation i.e. erosion.
Flood	Death of individuals, local extinctions. Habitat loss and degradation. Change in hydrology i.e. reduced water quality, geographic location. Change in the composition of indigenous plant communities. Erosion.
High winds, cyclone, associated storm surge, rip tides	Death of individuals, local extinctions. Habitat loss and degradation. Reduced water quality.

2.3.8 Small Population Size, And Restricted Distribution

When the wild population of a threatened species is reduced to low numbers, or restricted in its distribution, it becomes vulnerable to localized natural disasters. Changes in the environment (i.e. fire, disease, predator increases, climate change) mean that local extinction can occur. The loss of genetic diversity associated with a population decrease can result in inbreeding depression, which further weakens the population. Also, when there is limited capacity to disperse, a population's ability to reproduce successfully is reduced.

2.3.9 Activity Specific Threats

Development – Subdivision/Urban Expansion

The concentration of settlement in specific areas can significantly affect the conservation of biodiversity as threats are amplified by increasing human population and consumption. Freshwater

and coastal ecosystems are particularly sensitive to development. The following factors determine the severity of impact on biodiversity associated with development: location, ecosystem type, land cover, spatial and temporal pattern of subdivision, number of lots, existing and future land use, and the attitudes and values of landowners.

Even though the impact of a subdivision may appear minor, consideration needs to be given to the cumulative long-term effect. Major risks include:

- Habitat loss and degradation, including fragmentation. Indigenous vegetation clearance can result in death of individuals and local extinctions. Loss and degradation of habitat threatens more terrestrial species than any other process (Kingsford et al. 2009).
- A negative impact on hydrology such as the quality and quantity of ground and surface water due to storm water run off, sediment generation, and waste water disposal.
- Modification of freshwater ecosystems through use of culverts, drains, dams, and bridges, and diversion of water from rivers. Most natural lowland biotic communities on floodplains and wetlands in New Zealand have been lost.
- Increased soil erosion, and decline in soil health.
- Increase in invasive species diversity, spread and impact.
- Increased human disturbance associated with recreational activities i.e. horse riding, quad bike riding, walking/tramping, wind surfing, and use of jet skies.

Development – Land Use

The impact of land use development is similar to subdivision as it also intensifies use of the land. Similar variables determine the level of impact on biodiversity, i.e. location, ecosystem type, land cover, existing and future land use, and the attitudes and values of the land owners. Serious consideration needs to be given to the cumulative long-term effects. Kingsford et al. 2009 identified the following land use activities as primary threats; agriculture, commercial logging, and intensification of cultivation. Major risks include:

- Habitat loss and degradation, including fragmentation.
- Trampling and grazing by stock.
- A negative impact on hydrology such as the quality and quantity of ground and surface water due to run-off; fertiliser, animal waste, herbicides, pesticides, stormwater, point source discharge, and run-off of: fertiliser, animal waste, herbicides, pesticides, storm water, point source discharge, and waste water disposal. Excessive nutrients result in eutrophication of freshwater lakes.
- Modification of freshwater ecosystems through water extraction, drainage of wetlands, flood control programmes, diversion of water from rivers, and the use of culverts, weirs, drains, dams and bridges.

- Increased soil erosion, and decline in soil health as well as loss of versatile soils, and sedimentation of waterways.
- Increase in invasive species diversity, spread.

2.3.10 Lack of Management Sustainability

A report by Sporle (2008) identified sustainability as a major issue for groups undertaking biodiversity protection on private land. Landcare and community groups make a major contribution to the enhancement of New Zealand's indigenous biodiversity with their large-scale ecosystem protection and management projects. These are at risk of failing in the long-term, which could result in rapid deterioration of the environment, and all the gains secured being lost.

The key issues are; the nature of funding, dependence on voluntary input, and project management. Community groups have to secure funding for their projects. The funding available for community groups is generally allocated in the short-term (one year), and most funders prefer to support one-off projects over ongoing work. This makes it difficult to budget in the future. The majority of funders expect projects to become self-sustaining in the long-term, which is an unrealistic option as there are not currently opportunities for this in New Zealand. Funding applications have structured criteria and important components such as capital items, travel costs, consultants, legal and accounting costs, resource inventory, monitoring and training, are usually excluded. The loss of funding to a community group would result in an immediate reduction of work and enthusiasm, and the investments in the land would be lost.

Community groups are dependent on voluntary input, with as much as 67% of the work carried out by volunteers (Sporle, 2008). Volunteers contribute considerable amounts of unpaid time, effort, financial assistance and other resources. It is hard to recruit enough people to share the workload, and there is a risk people can become overloaded, overwhelmed and burn out. This can result in a lack of continuity. It is hard for community groups to recruit people with essential skills due to the difficulty of obtaining funding for administration, planning, management and monitoring, and salaries for specialist roles.

The management of community based biodiversity protection projects is a heavy burden. Considerable unpaid work is spent on administration, legal requirements, project organising, meetings, and sourcing resources. The groups need assistance to complete applications i.e. funding, Department of Conservation permits, communication (reports to funders), and fundraising. Due to the work load there is greater focus on what is immediately at hand rather than forward planning. As a result few community groups have strategic plans or action plans which are necessary to ensure the ongoing success of projects.

3. State Of Biodiversity

The natural environment of the Whangarei District contains many and varied landscapes, providing a diverse range of habitats and promoting a high level of biodiversity. Habitats vary from the extensive lowlands of the Hikurangi Swamp, to over 200km of coastline, with the harbour supporting over 10,000 waterbirds, rolling pasture land, volcanic scoria cones supporting volcanic broadleaf forests and 17 major river catchments. Indigenous forest covers 22% of the district, and the district is also home to populations and breeding sites of North Island brown kiwi, Pateke (brown teal), Hochstetter's frog, and the New Zealand fairy tern. Whangarei District is also home to 220 regionally significant species such as the New Zealand scaup, kukupa (native wood pigeon), and banded kokopu. The natural environment plays an important role in defining the character of the district. It has been shown that one of the main reasons people come to Northland is the quality of the environment, and the main reason for staying, is again the environment (Ministry for Culture and Heritage, 2008).

The following information is based on the state of the environment indicators set out at the beginning of this report, and is intended to provide a picture of the state of biodiversity in the Whangarei District. The data begins with land use and land cover data in order to outline the state of our land and vegetation as they relate to the biodiversity of ecosystems. Following, is the status of threatened species in the district along with data and trend analysis. The state of threats to biodiversity in the district is then outlined.

3.1 Ecosystems

3.1.1 Land Cover Database

The New Zealand Land Cover Database (LCDB 1 & 2) is a digital map of the land surface of the country, created using satellite imagery technology. The entire area of New Zealand was identified and classified into 43 types of land cover classes, for example: indigenous forest, grassland, manuka and kanuka, etc. The first version – LCDB1 - was completed in 1996, and an update (LCDB2), was published in 2001. Land Cover Database 3 is yet to be published. Updated versions of the database allow for a comparison and analysis of trends in land cover over time. Using the LCDB2 classification, Whangarei District has 35 types of land cover classes (see Figure 2). In addition, Figure 4 gives a representation of the main types of land cover classes in the district, and a comparison of these between LCDB 1 and 2.

Figure 3 shows the proportion of LCDB2 classes within Whangarei District. The major land cover is High Producing Exotic Grassland (52.9%, 143,094ha), followed by Indigenous Forest (21.7%, 58,543ha) and Pine Forest – closed and open canopy (11.2%, 30,341ha). Manuka and or Kanuka (5.4%, 14,503ha) are present in lesser proportions. The land cover classes present in the smallest proportion are Landslide (0.0006%, 1.61ha), Fernland (0.0008%, 2.26ha), River and Lakeshore Gravel and Rock (0.0008%, 2.28ha), and Depleted Tussock Grassland (0.0025%, 6.81ha).

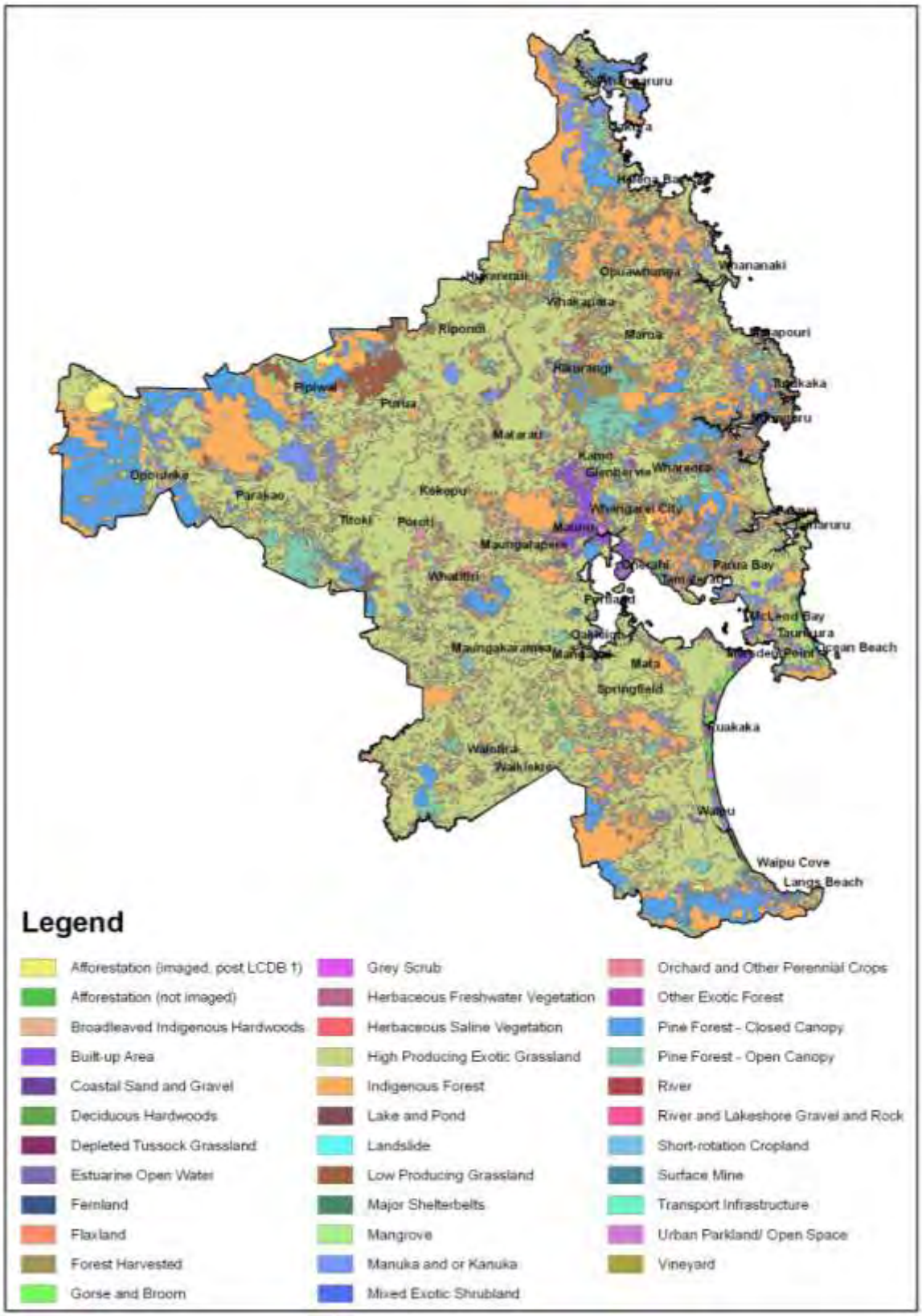

Figure 2: Land Cover Database 2.

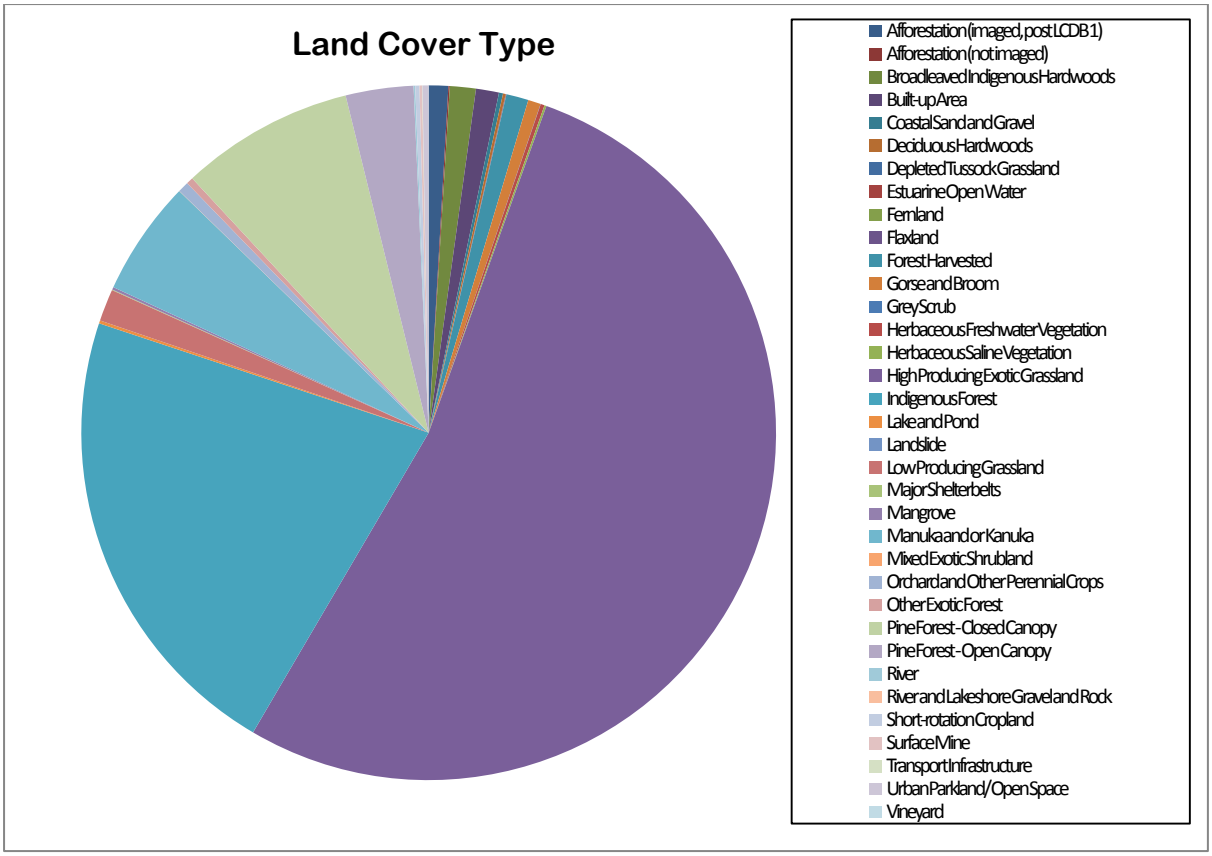

Figure 3: Proportion Of LCDB2 Classes Within Whangarei District.

A comparison of LCDB1and LCDB2 shows some differences in land cover in the district during the period from 1996 to 2001 (Table 3). Notable, was the loss of 284ha (0.4%) of indigenous land cover over the five year period. The greatest decline was in Manuka/Kanuka (105ha loss) and Broadleaved Indigenous Hardwoods (101ha loss). These losses were mainly the result of Afforestation (209ha or 74%), conversion to Forest Harvested (57ha or 20%), and conversion to Low Producing Grassland (14ha or 5%).

Table 3: Change In Indigenous Land Cover Between LCDB1 And LCDB2.

Landcover class (LCDB1)	Land Cover class (LCDB2)	No. Sites	Total (ha)
From → To			
Broadleaved Indigenous Hardwoods	Afforestation	23	91
	Low Producing Grassland	2	10
Fernland	Afforestation	4	19
Grey Scrub	Afforestation	1	1
Indigenous Forest	Forest Harvested	9	54
Manuka or Kanuka	Afforestation	15	98
	Forest Harvested	2	3
	Low Producing Grassland	1	4
Urban Parkland / Open Space	Built-up Area	1	4
Total		58	284

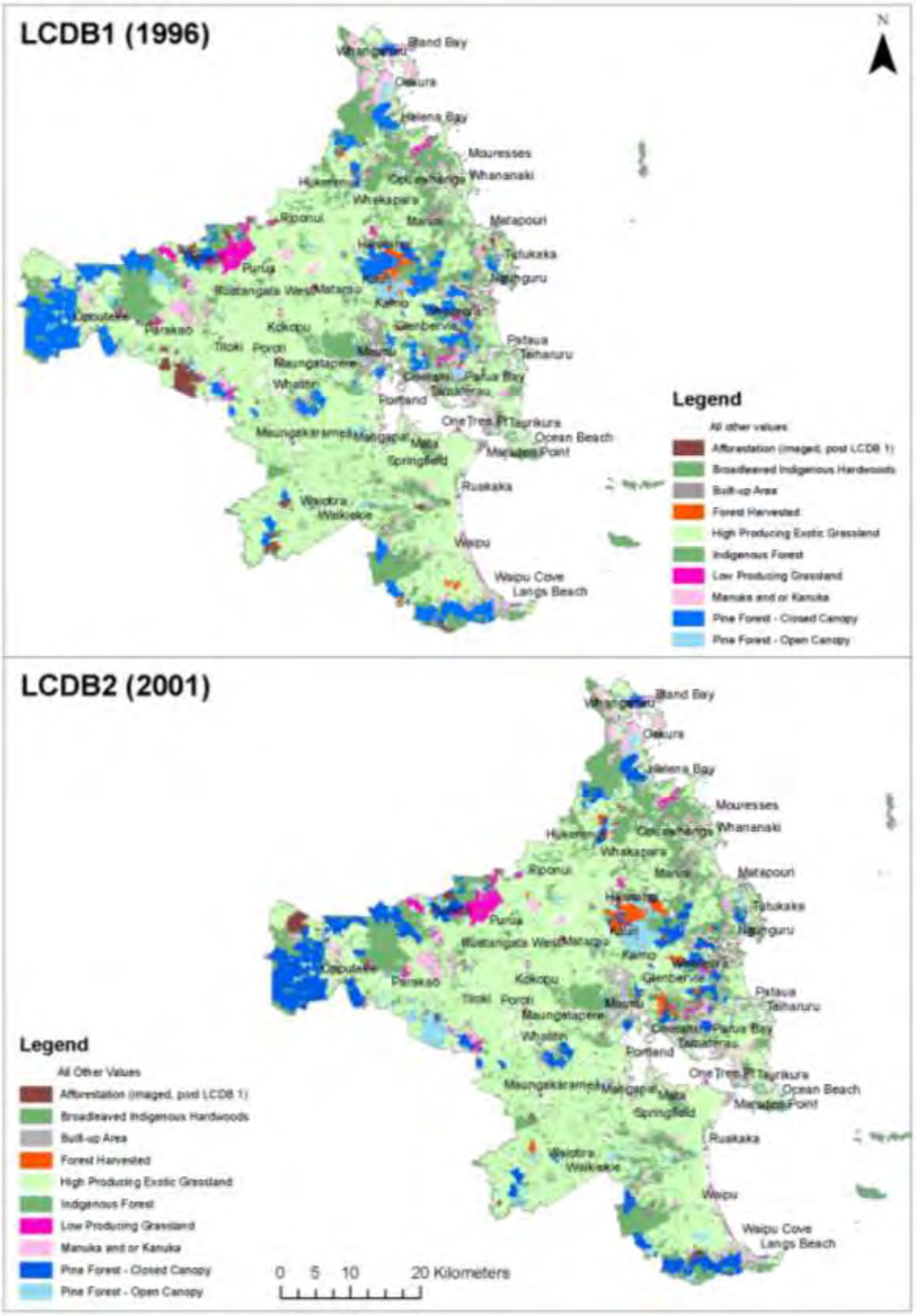

Figure 4: Main Types Of Land Cover In The District, And Comparison Between LCDB1 and 2.

3.1.2 Land Environments

Land Environments of New Zealand (LENZ) is an environmental classification framework for conservation management which utilises the natural relationship between the environment and species distributions. Rather than occurring randomly, species tend to occur in areas having similar environmental conditions. As a consequence, similar environments tend to support similar groups of plants and animals, provided they have not been substantially modified by human activity.

LENZ capitalises on the species-environment relationship by identifying climatic and landform factors likely to influence the distribution of species. LENZ uses these factors to define a landscape classification that groups together sites that have similar environmental conditions, and divides the country into such groups. This classification can then be used to indicate sites likely to have similar potential ecosystem character i.e. groups of species and similar biological interactions and processes, e.g. riverine forest, wetlands, dunelands, etc. At the highest LENZ group - Level I – the country is divided into 20 land environments. Of these 20 environments, three are present in the Whangarei District – Northern Lowlands (Environment A), Northern Hill Country (Environment D), and Northern Recent Soils (Environment G). At LENZ Level I, three quarters of the district (75.3% or 203,408ha) is classified as Northern Lowlands (A), 17.2% (46,403ha) as Northern Hill Country (D), and 7.2% (19,358ha) as Northern Recent Soils (G). A further 0.3% is unclassified. The distribution of these environments in the district is shown in Figure 5.

Environment A (Northern Lowlands) encompasses the extensive lowlands of the northern North Island with the majority occurring in Northland, Auckland and Waikato. Climatically, Environment A is warm, with very high annual and winter solar radiation. Minimum winter temperatures are also high, with frosts occurring only infrequently from Auckland north. Although annual water deficits are low, the low monthly water balance ratio makes this environment susceptible to drought in years with lower than average rainfall. October vapour pressure deficits are moderate. Landforms are generally flat to gently rolling, with parent materials that include deeply weathered sandstone and greywacke, older volcanic tephra, alluvium from various sources, peat and older basaltic rocks. Most soils are poorly to moderately drained and of low natural fertility, reflecting the intense weathering caused by the warm, moist climate (Leathwick et al., 2002).

Environment D (Northern Hill Country) encompasses hill country of low to moderate elevation in the central and northern regions of the North Island. Environment D has a warm climate, with high annual and winter solar radiation, low monthly water balance ratios and slight annual rainfall deficits. However, year-to year variation in rainfall results in occasional dry years, particularly on the East Coast. Vapour pressure deficits are intermediate, although higher in the east. The terrain of Environment D is hilly with moderate to steep slopes. Soil parent materials are variable, with older volcanic rocks and greywacke widespread in the north, including on the Coromandel Peninsula while mixtures of greywacke and Tertiary rocks with some rhyolitic tephra predominate in the east. Soils are generally moderately drained and of low to moderate natural fertility (Leathwick et al., 2002).

Figure 5: Land Environments New Zealand Level I.

Environment G (Northern Recent Soils) consists of recent soils in the lowlands of the northern two-thirds of the North Island and is dominated by two contrasting landforms. The first consists of narrow alluvial floodplains along rivers and larger streams distributed throughout Northland, Auckland, Waikato, Bay of Plenty and Gisborne, and extending into northern Hawke's Bay in the east and to coastal Taranaki in the west. The second includes coastal sand dunes that are most extensive along the west coast of the northern North Island. Environment G also includes smaller areas of land in which soils are formed from erosion debris from greywacke and argillite, soft tertiary rocks, estuarine alluvium and peat. Environment G has a warm climate with very high annual and winter solar radiation, reflecting its northern location. Average water deficits are low and vapour pressure deficits are moderate, but the low monthly water balance ratio results in droughts in years with below-average rainfall, particularly in the east. The terrain is generally flat to gently sloping. Soils are typically well-drained but of low to moderate fertility (Leathwick et al. 2002)

At LENZ Level III, the land classification occurs at a finer scale, which results in a greater number of environments. At this level there are 200 land environments nationally, 11 of which are present in Whangarei District (see Figure 7 and following description). Land environment A6.1 is present in the greatest proportion (58.9%), followed by D1.1 at 16.6% (Figure 6). These environments account for three quarters of the district. The environment least represented is A5.2 at 0.002%, or just 5ha, present mainly around Titoki.

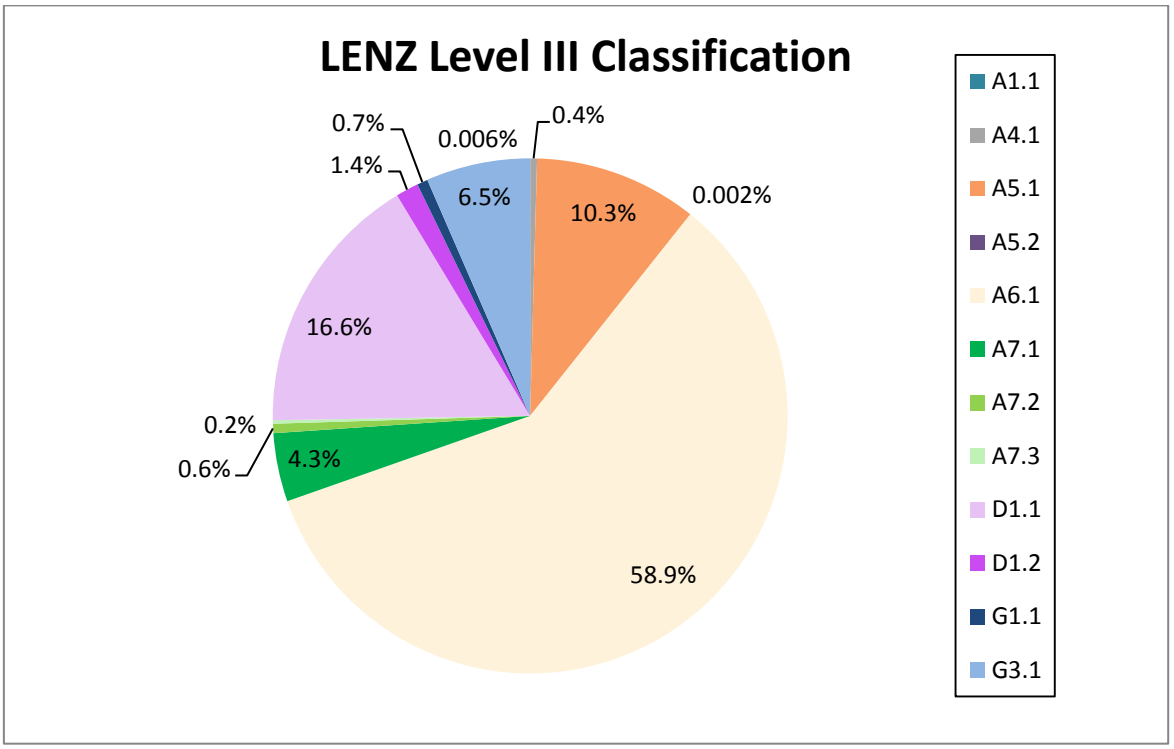

Figure 6: Proportion Of LENZ Level III Environments In Whangarei District.

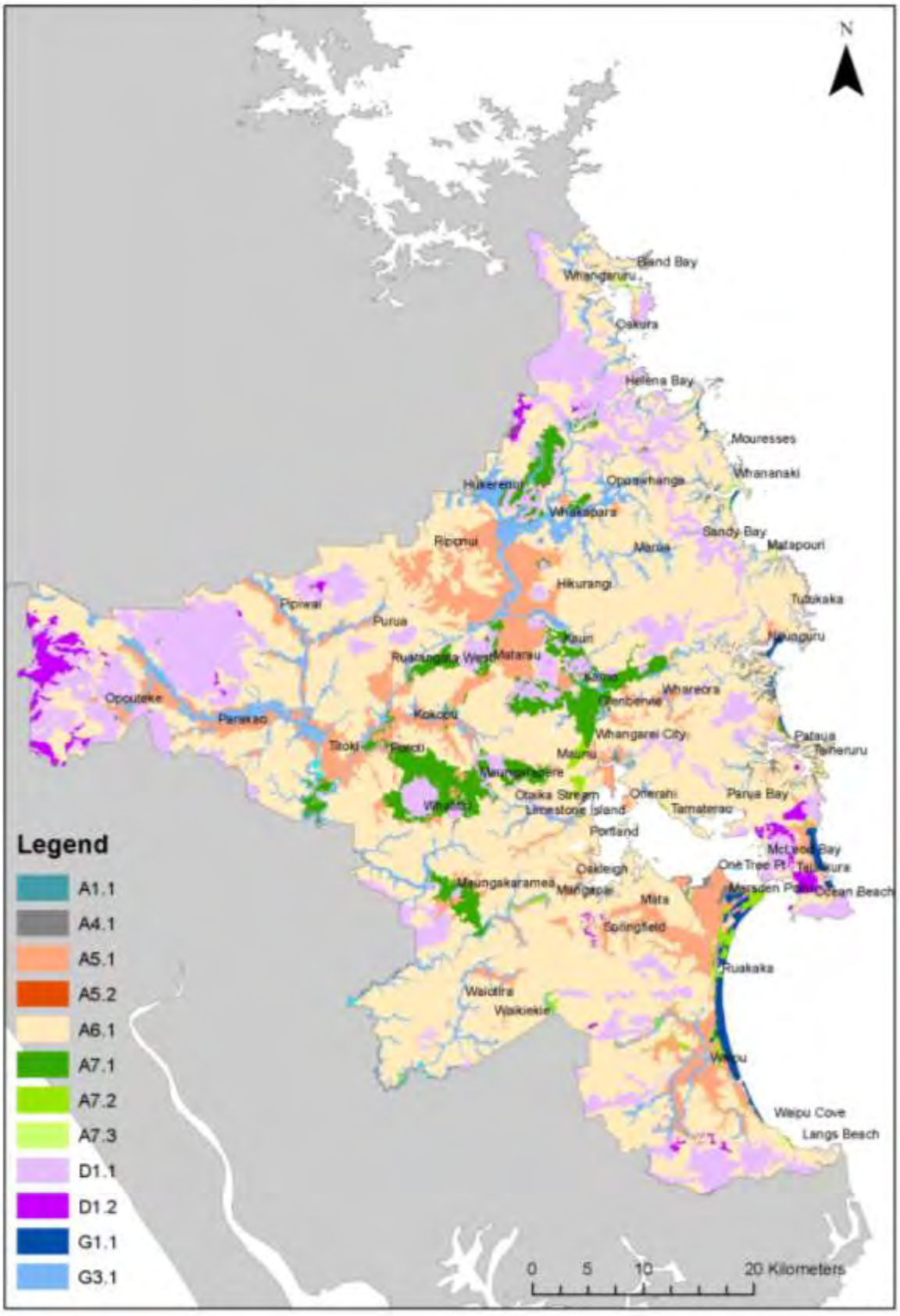

Figure 7: Land Environments New Zealand Level III.

The following descriptions of Level III land environments are taken from Leathwick et al. (2002) – "Land Environments of New Zealand – A Technical Guide."

A1 (Northern Lowlands)

Environment A1 consists of the hills that extend from the Three Kings Islands to North Cape, and south to Ahipara at the base of 90 mile beach, with smaller areas on northern Great Barrier Island. In the Whangarei District, Environment A1 is present on the offshore islands (Poor Knights, Hen and Chicks), and in the north around the coastline at Whangaruru. The climate of Environment A1 is very warm, with very high solar radiation, very low monthly water balance ratios and moderate annual water deficits. Soil parent materials are predominantly basalt and older sand deposits, with some sandstone, rhyolite and greywacke. Soils are imperfectly drained and of low natural fertility.

A4 (Northern Lowlands)

Environment A4 occurs as small pockets scattered throughout the northern North Island in protected coastal estuaries, harbours and inlets mostly in Northland but also extending as far south as Marokopa and the Tauranga Harbour. Very warm temperatures, very high solar radiation and low annual water deficits typify the climate of Environment A4. Estuarine alluvium is the sole parent material and the calcium-rich saline soils are poorly-drained and of moderate fertility.

A5 (Northern Lowlands)

Environment A5 is widespread, consisting of flat sites at low elevation. Climatic conditions are generally cooler than in the preceding Level II environments, with only moderate rainfall deficits. Alluvium from a variety of sources, including estuarine sediments and rhyolitic and andesitic ash are dominant, along with peat and some older sands. Soils are typically poorly-drained and of low to moderate natural fertility.

A6 (Northern Lowlands)

Environment A6 has the highest mean elevation of the Level II environments in A, consisting of rolling hills in Northland, Auckland and northern Waikato. The largest of the A environments (nearly 50% of A's total area), it has warm temperatures, very high solar radiation and low annual water deficits. Sandstone is the most widespread soil parent material closely followed by greywacke – both are deeply weathered. Soils are imperfectly drained and are of low natural fertility.

A7 (Northern Lowlands)

Environment A7 is the southernmost of the Level II environments within A, occurring on gently sloping land at low to mid-elevation in Auckland, Waikato and the Bay of Plenty with smaller areas in Northland and around Mahia Peninsula. Climatic conditions are warm with high solar radiation and low annual water deficits. Rhyolitic alluvium and tephra are the dominant soil parent materials with smaller areas of younger basaltic rock, wind-blown sand and loess. Soils are well-drained but of moderately low natural fertility.

D1 (Northern Hill Country)

Environment D1 consists of hills in Northland, Auckland, Coromandel and the eastern Bay of Plenty. The climate is warm with very high solar radiation and slight annual water deficits. Predominant soil parent materials are deeply weathered older basalts (Northland), andesites and rhyolites with greywacke, argillite and sandstone locally important. Soils are generally imperfectly drained and of moderate natural fertility.

G1 (Northern Recent Soils)

Environment G1 consists of coastal sands occurring from Cape Egmont to North Cape along the North Island's west coast and from Auckland City north in the east. Climatic conditions are very warm, with very high levels of solar radiation, moderate vapour pressure deficits, low monthly water balance ratios and low annual water deficits. Dune sands are by far the most extensive soil parent material, but small areas of argillite and greywacke with recent soils also occur on Motutapu Island in the Hauraki Gulf. Soils are well-drained but of low natural fertility.

G3 (Northern Recent Soils)

Environment G3 is widely distributed along gently sloping flood-plains of rivers and larger streams throughout the northern half of the North Island, occurring in Northland, Waikato, the Bay of Plenty, the more coastal parts of Gisborne, and northern and central Hawke's Bay. The climate is warm with high solar radiation, high vapour pressure deficits and low annual water deficits. Soil parent materials are mostly fine-textured alluvium with some rhyolitic ash, dune sand and loess. Drainage is moderate and the natural soil fertility is moderate to low.

3.1.3 Ecosystem Types

Northland contains four broad indigenous ecosystem types, and they are spread through out the Ecological Districts. A detailed description of these ecosystem types can be found in Conning (2001).

1. *Forests and shrublands*
    a. Mixed lowland kauri-podocarp-broadleaf forest
    b. Upland podocarp-broadleaf forest
    c. Volcanic broadleaf forest
    d. Kauri forest
    e. Podocarp forest
    f. Coastal forest
    g. Riverine flood/alluvial forest
    h. Duneland forest
    i. Shrubland
    j. Exotic forest

2. *Freshwater wetlands*
    a. Rivers and streams
    b. Lakes, swamps and bogs
        i. Dune lakes, volcanic lakes, ngawha thermal lakes
        ii. Swamps
        iii. Peat bogs, intermediate wetlands, ephemeral wetlands, modified/constructed wetlands

3. *Coasts, dunelands and estuaries*
    a. Estuarine
        i. Mangroves, saltmarsh, intertidal sand-mudflat, shellbanks
    b. Coastal
        i. Hard coasts, soft coasts (foredunes and beaches, duneland and spits)

4. *Offshore islands and stacks*

N.B. In addition to these there is Podzol Gumland.

3.1.4 Ecological Districts

An ecological district is a locality where geological, topographical, climatic, and biological (soil, vegetation, fauna) features, and processes, interrelate to produce a characteristic landscape and range of biological communities. An ecological region is a group of adjacent ecological districts with closely related characteristics. New Zealand is divided into 85 ecological regions and 268 ecological districts (McEwen, 1987).

Ecological regions and districts were developed for the Protected Natural Areas Programme (see section 3.1.5), run by the Department of Conservation. The programme utilised a process of field survey and evaluation to identify natural areas of ecological significance throughout New Zealand which are not well represented in existing protected natural areas. There are four ecological regions and eight ecological districts which are contained entirely or partly located within the Whangarei District; these are detailed in the following table.

Table 4: Ecological Districts In Whangarei District.

No.	Region	District	Characteristics	Priorities for protection
3.05	Eastern Northland	Whangaruru	Broadleaf-podocarp-kauri forest in the hill country with secondary kanuka forest and shrubland. Coastal vegetation types on the islands with remnants along the coastal fringe.	Nationally under-represented ecosystems, especially alluvial and riverine forest, limestone, estuarine, dunes, old growth coastal forest. Retention of sequences from forest to estuarine areas. Buffers to estuaries. Buffers and linkages between existing protected sites.
3.06	Eastern Northland	Whangarei	Secondary regenerating forest dominated by taraire, totara, kahikatea, and puriri.	Nationally rare riverine flood forest and shrubland, volcanic broadleaf forest, estuarine systems, coastal

				forest and shrubland, freshwater wetlands, limestone ecosystems. Buffering of Otakairangi wetland.
3.07	Eastern Northland	Manaia	Bream Head Peninsula. Coastal forest, sandy beaches and dune fields.	Buffers and linkages to existing protected areas, coastal forest, especially riparian, coastal wetlands, coastal dune lands.
3.08	Eastern Northland	Taranga	Coastal broadleaf forest.	The Islands (844ha) are fully protected as a Nature Reserve.
3.09	Eastern Northland	Waipu	Broadleaf-podocarp-kauri forest on the ranges, some of which contain hard beech. Regenerating manuka and kanuka on the margins. Sandy beaches, dunefields, and alluvial flats. A few remnants of alluvial forest. Bream Tail - steep rocky coastline with pocket sand and gravel beaches. Small estuaries at the mouths of the Ruakaka and Waipu Rivers.	Riverine forest, wetlands, linking of fragmented reserves.
4.01	Poor Knights	Poor Knights	Coastal forest and shrubland dominated by pohutukawa and kanuka.	The Islands (271ha) are fully protected as a Nature Reserve.
5.05	Western Northland	Tangihua	Extensive riverine freshwater wetlands and swamp forests. Flood-plain wetland complexes. Forest tracts on the steeper massifs. Alluvial riverine forest remnants. Alluvial deposits are common along river valleys in the sedimentary hill country.	Wetland ecosystems in the north-east and south-west of the District. Alluvial and riverine forest, podocarp forest, and gumland ecosystems. Large natural areas with a diversity of vegetation types and species including enclaves and buffers to existing large reserves.
6.01	Kaipara	Tokatoka	Diverse vegetation sequences from riverine flood habitats through to hill slope forests along the Manganui River complex. Mosaic of small flood plain forest remnants, old-growth forest and lowland forest. Taraire forest is the most common mature forest type. Regenerating totara forest, kauri dominant forest, and distinctive vegetation types.	Riverine flood forest, floodplain forest and associated wetland ecosystems. Broadleaf forest on alluvium, volcanics and limestone, podocarp forest, nikau and kowhai forest and other wetland ecosystems. Kauri forest and shrubland ecosystems.

N.B. All of the Ecological Districts contain threatened plant and animal species which are priorities for protection.

Figure 8: Boundaries Of Ecological Districts Which Intersect With Whangarei District.

The Manaia, Taranga and Poor Knights Ecological Districts are fully contained within Whangarei District, as are the majority of Whangarei and Waipu Ecological Districts. Over half of the Whangaruru District is included. The Tangihua, Tokatoka and Tutamoe are present in decreasing proportions.

Table 5: Summary Of Key Features Of Ecological Districts In Whangarei.

Ecological District	Size (ha)	Land Area Within Whangarei District	% Land Area Within Whangarei District
Whangarei	82,214*	70,314	97.5
Waipu	49,755	45,160	90.7
Whangaruru	115,781	75,924	65.6
Manaia	6,430	6,430	100
Taranga	34,426**	864	100
Poor Knights	37,294**	288	100
Tangihua	165,703	55,350	33.4
Tokatoka	74,669	14,189	19
Tutamoe	81,664	2,225	2.7

* Includes Whangarei harbour (10,105ha)
** Includes an area of Pacific Ocean

3.1.5 Protected Natural Areas Programme

The Protected Natural Areas Programme is a process whereby all remaining natural areas of ecological significance (significant natural areas) throughout New Zealand are identified, surveyed, evaluated and mapped by the Department of Conservation (Northland Regional Council, 2007). The process was initiated in 1983 to fulfil obligations under the Reserves Act (1977):

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

The specific goal of the programme is:

> *"To identify and protect representative examples of the full range of indigenous biological and landscape features in New Zealand, and thus maintain the distinctive New Zealand character of the country."*

A report is produced for each ecological district, outlining the significant natural areas which are not well represented in existing protected areas. These areas form the basis for identifying and evaluating biodiversity values in the area, and identifying priorities for protection. Reports for Whangarei (2001), Whangaruru (2005), Waipu (2007), Tutamoe (2008) and Tangihua (2009) Ecological District have been published (see Figure 9). These cover 93.4% of Whangarei District. The Manaia report was published in 2010, and the report on Tokatoka is likely to be published around 2011. A report will not be published for the Poor Knights Islands or Taranga (Hen and Chickens Islands) as these are fully

protected. Approximately 22% of the district has been identified as significant natural areas, as a part of this programme. There will most likely be more identified when the final Tokatoka report is released.

Within the reports, sites are grouped into levels of ecological significance (Level 1 or 2). Level 1 sites are the highest priority for protection, and include areas that:

- Contain best representative or only example of a habitat type in an ecological district, support fauna endemic to Northland or Northland-Auckland.
- Contain or are regularly used by threatened or regionally significant species. Contain rare or threatened habitat types.
- Have a high diversity of taxa or habitat types.
- Have a high degree of 'naturalness'.
- Form ecological buffers, and linkages with other areas of significant habitat.
- Cover a large geographic area.
- Have a high or medium long-term viability.

For example, 169/183 or 92% of the sites in Whangaruru Ecological District contain Level 1 sites of significant vegetation and/or habitats of indigenous fauna, which are a priority for protection (see Table 6).

Table 6: Summary Of Key Features Of Published Protected Natural Area Reports.

Ecological District	No. areas Ecological Significance	% of Ecological District	No. Level 1 Sites	Notes	No. Polygons	No. of Sites <1ha
Whangarei	108	19	102	Incl. Whangarei Harbour	549	48
Waipu	86	30	57		110	19
Whangaruru	183	46	169	Incl. Russell	359	18
Tangihua	151	19	105	Whole ecol district	827	101
Tangihua intersection with Whangarei District	57		44	32.5% of the land (ha) covered by areas of ecological significance is within Whangarei District.	239	33

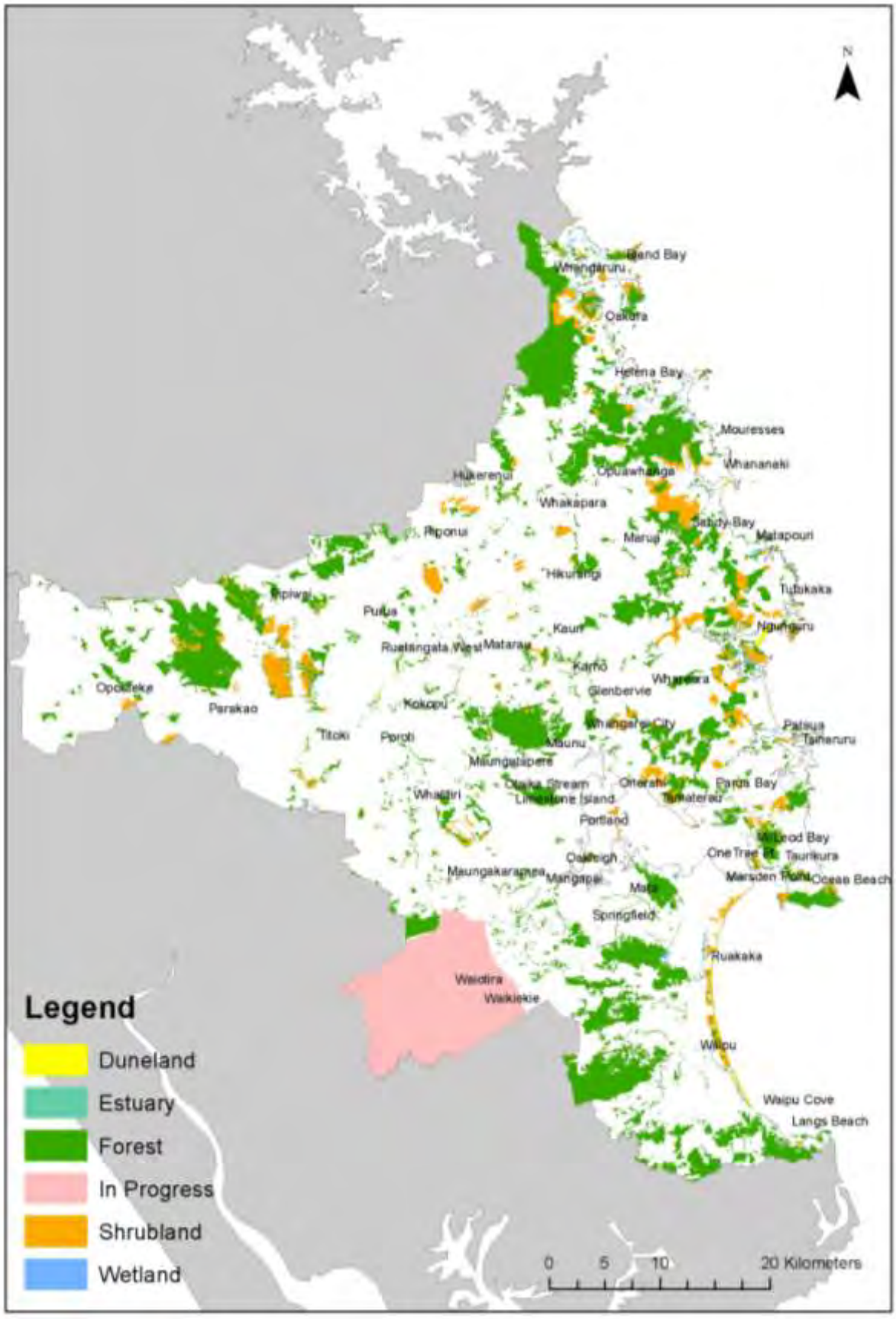

Figure 9: Published Protected Natural Areas.

3.1.6 Threatened Environments

The Threatened Environment Classification is a combination of three national databases: land environments (LENZ), land cover classes (LCDB2), and protected areas (PAN-NZ). The classification was developed by Landcare Research to help identify environments where a large proportion of native vegetation has been cleared, and only a small amount of what remains is legally protected. It can be used to help identify places which are priorities for protection of indigenous biodiversity, to plan biodiversity protection activities, and to report achievements. The classification divides New Zealand into six categories of 'threatened environments' as follows:

Environments with much reduced indigenous biodiversity:

- Acutely Threatened: <10% indigenous vegetation remaining.
- Chronically Threatened: 10 – 20% of indigenous vegetation remaining.
- At Risk: 20 – 30% of indigenous vegetation remaining.

Environments with poorly protected indigenous biodiversity:

- Critically Under-protected: >30% of indigenous vegetation remaining, and <20% protected.
- Under-protected: >30% indigenous vegetation remaining, and 10-20% protected.

Environments where indigenous biodiversity is less reduced and better protected:

- Less Reduced and Better Protected: >30% indigenous vegetation remaining, and >20% protected.

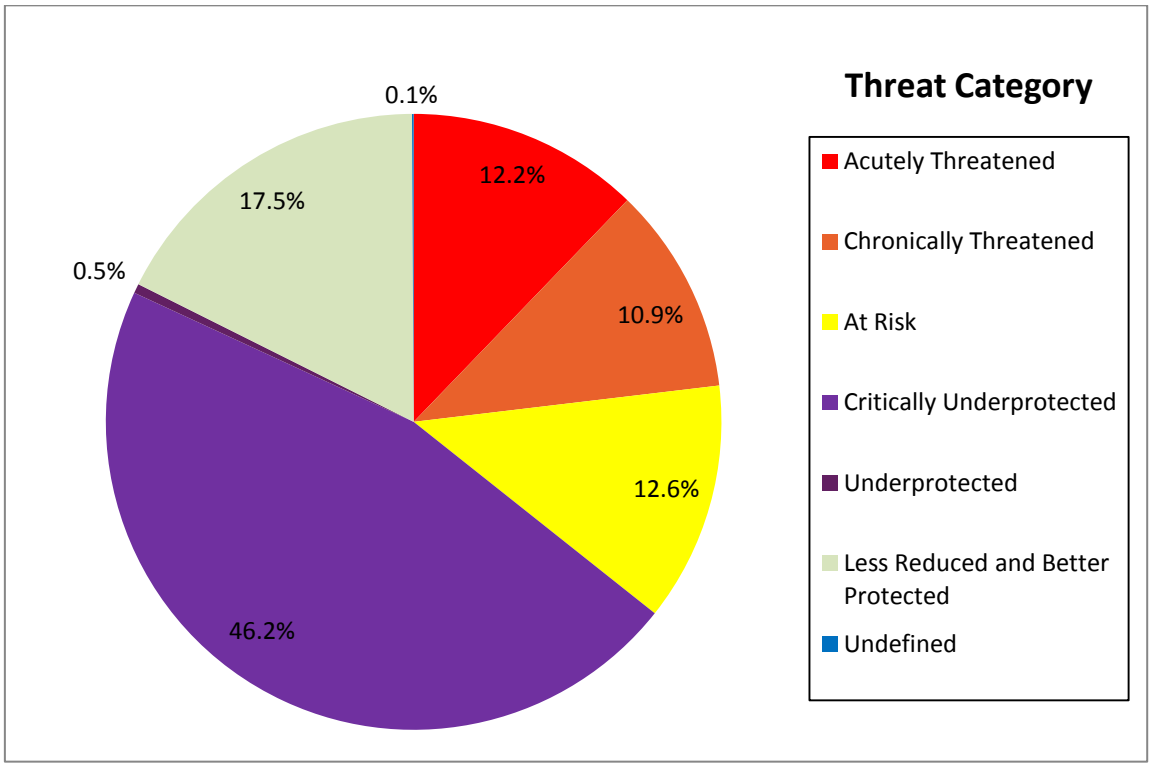

Figure 10: Proportion Of Threatened Environments Within Whangarei District.

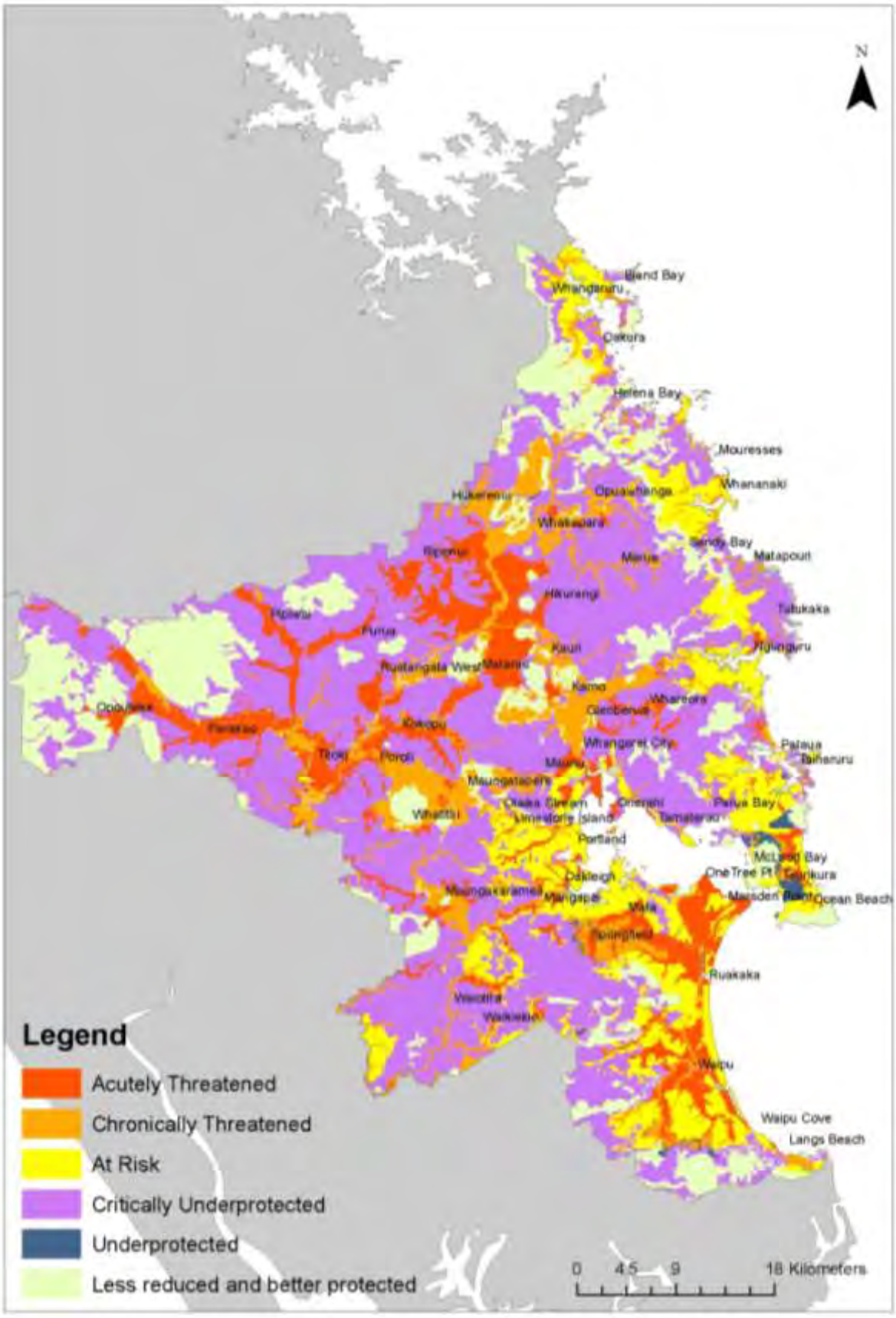

Figure 11: Threatened Environments Within Whangarei District.

Figure 10 shows the location of threatened environments within Whangarei District. Approximately, 12% (32,920ha) of land is Acutely Threatened and 10.9% (29,403ha) is Chronically Threatened. Acutely and Chronically Threatened areas can be thought of as remaining bush fragments in highly modified environments. These areas account for 23% of the district area, meaning that nearly a quarter of the district has only a fifth or less indigenous vegetation remaining. In addition 12.6% is At Risk (33,879ha), 46.2% is Critically Under Protected (124,575ha), 17.5% is Less Reduced and Better Protected (47,281ha), and 0.5% is Under Protected (1,326ha); the remaining area (0.1%) is not categorised (Figure 8).

The Statement of National Priorities for Protecting Rare and Threatened Biodiversity on Private Land, (Ministry for the Environment, 2007), states that National Priority 1 is to protect those areas with less than 20% indigenous vegetation remaining. This priority aligns with protecting Acutely and Chronically Threatened areas.

3.2 Species

3.2.1 Threatened Species

The New Zealand Threat Classification System used by the Department of Conservation provides a benchmark for assessing the risk of extinction faced by a species. It forms the framework of biodiversity recovery programmes, enables managers to prioritise natural resource decisions, and provides support for species protection.

Factors that determine whether a species is included in the threat classification include whether:

- It is endemic or indigenous.
- It has a name legitimately published and accepted.
- It is alive in the wild.
- It breeds in New Zealand.
- It arrived pre- or post-1950 without human help.
- There is sufficient information available to make an assessment.

Following these criteria, there are factors determining the threat classification allocated to a species:

- Total population size –number of mature individuals.
- Population trend – ongoing and predicted decline due to existing threats.
- Total number of populations.
- Number of mature individuals in the largest population.
- Area of occupancy of the total population.

The structure of the Threatened Species Classification System is outlined in Figure 12. Species not included in the classification system are not considered to be threatened.

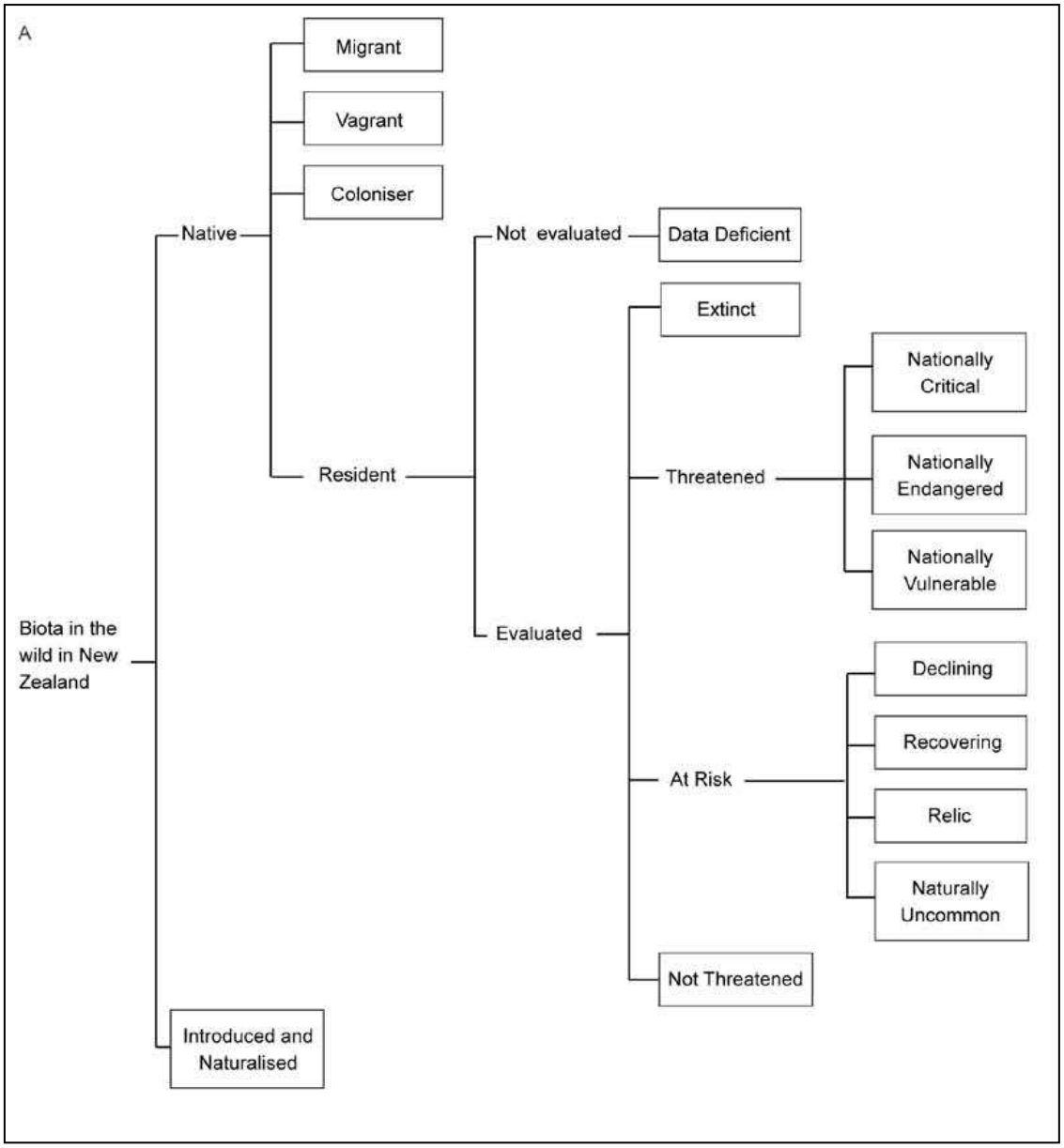

Figure 12: Revised New Zealand Threat Classification System (2007). Source: Townsend et al., 2008.

There are 205 species classified using this system in the Whangarei District. Approximately 21% (45) are described as 'threatened' and 79% (160) as 'at risk'. Of the total number, 125 (60%) are animals, such as the New Zealand fairy tern, white heron, and Pateke (brown teal). There are also 80 species of threatened plants (40% of total), including kakabeak, royal fern and the dune species pingao. Appendix D and E list the threatened animal and plant species found in the Whangarei District along with their status, and detail on location (when known).

Table 7: Classification Status Of Threatened And At Risk Species Within Whangarei District.

	Threatened			At Risk				Subtotal Threatened	Subtotal At Risk	Total
	Critical	Endangered	Vulnerable	Declining	Recovering	Naturally Uncommon	Relict			
Birds	4	2	11	7	5	9	3	17	24	**41**
Mammals	--	--	1	--	--	--	--	1	0	**1**
Reptiles and Amphibians	--	--	--	4	--	8		0	12	**12**
Fish	--	--	--	4	--	3	--	0	7	**7**
Invertebrates	2	4	1	5	--	52	--	7	57	**64**
Subtotal Animals	6	6	13	20	5	72	3	25	100	**125**
Plants	8	11	1	23	--	37	--	20	60	**80**
Total	**14**	**17**	**14**	**43**	**5**	**109**	**3**	**45**	**160**	**205**

In addition, there are 220 regionally significant species present in the Whangarei District. Regionally significant species are those that have been assessed by the Department of Conservation to be either rare or threatened within the Northland Region. In Whangarei District, 15 of these are animals such as the bellbird, forest gecko, and banded kokopu; 205 are plants such as gully tree fern, northern rata, and hard beech. These species have a limited distribution and small population size. Appendix F lists all regionally significant plant and animal species present in the Whangarei District.

Table 8: Regionally Significant Species within Whangarei District.

Birds	10
Reptiles and amphibians	1
Fish	4
Invertebrates	undetermined
Plants	205
Total	**220**

3.2.2 Distribution

The Department of Conservation is responsible for collecting data on the natural heritage of New Zealand. Information on the distribution of threatened species is stored primarily in Bioweb, a national database system. However, the data quality is limited for several reasons including: lack of resources, prioritisation, the changing status and taxonomy of species and the format of the data (although work is occurring on minimum standards). In addition there is no funding available to undertake field surveys to collect up-to-date information and as a result a lot of the data is old. Data on species distribution is also stored in the Sites of Special Biological Interest (SSBI) hard copy files, and Protected Natural Areas reports. There are also databases held by other organisations e.g. Auckland Herbarium, Landcare Research, Forest Research Institute (FRI). The Department of Conservation plans to replace Bioweb with a more comprehensive database Natural Heritage Management System (NHMS) which will be implemented progressively from 2011-2012.

Figures 13 and 14 show the distribution of threatened animal and plant species in the district, as taken from Bioweb. The dots correlate to the observation of a threatened species, not the number of species or individuals. There are 251 threatened animal observations, although the data contains a limited number of threatened invertebrate records. There are 516 threatened plant observations.

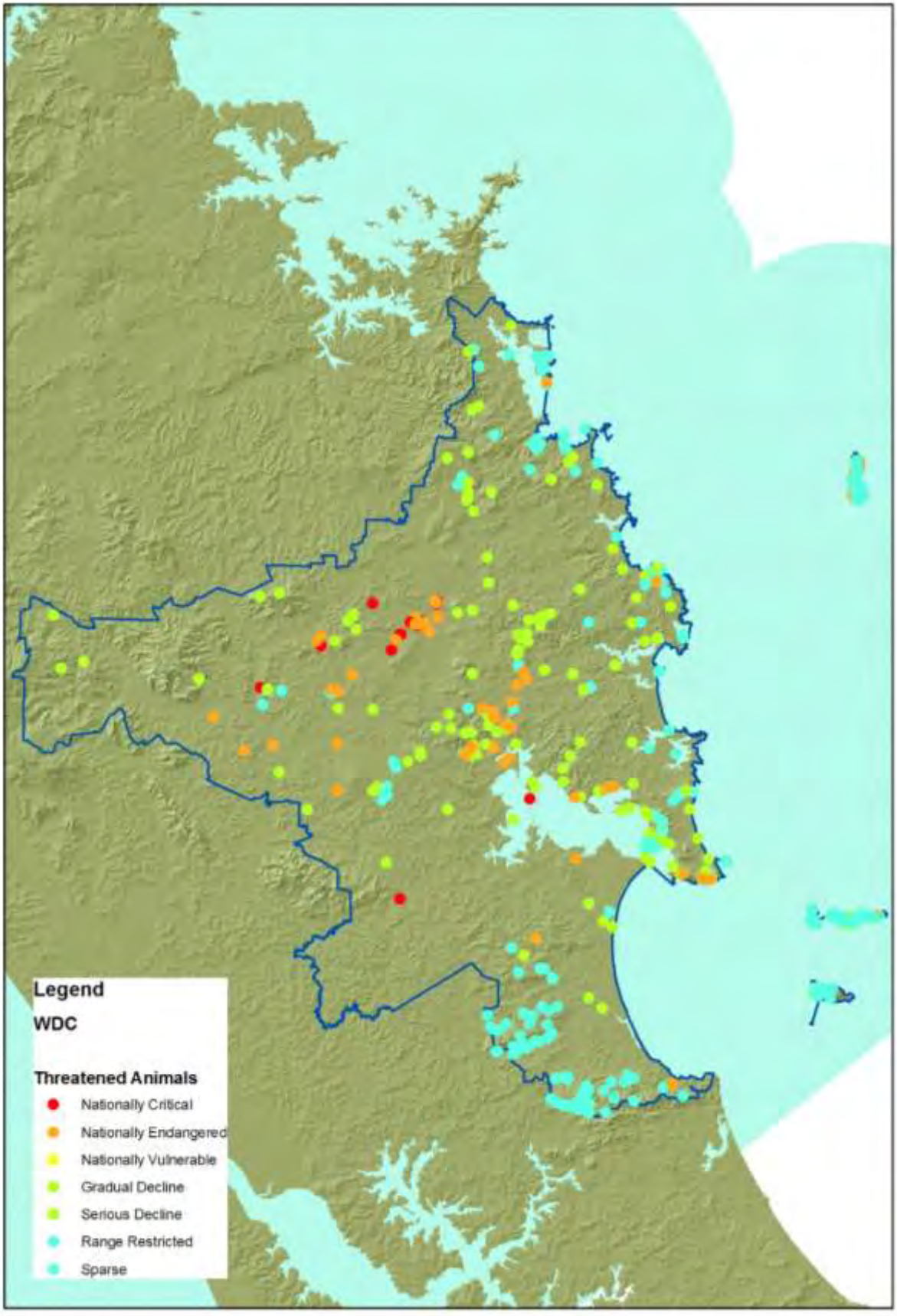

Figure 13: Observations Of Threatened Animal Species Within Whangarei District.

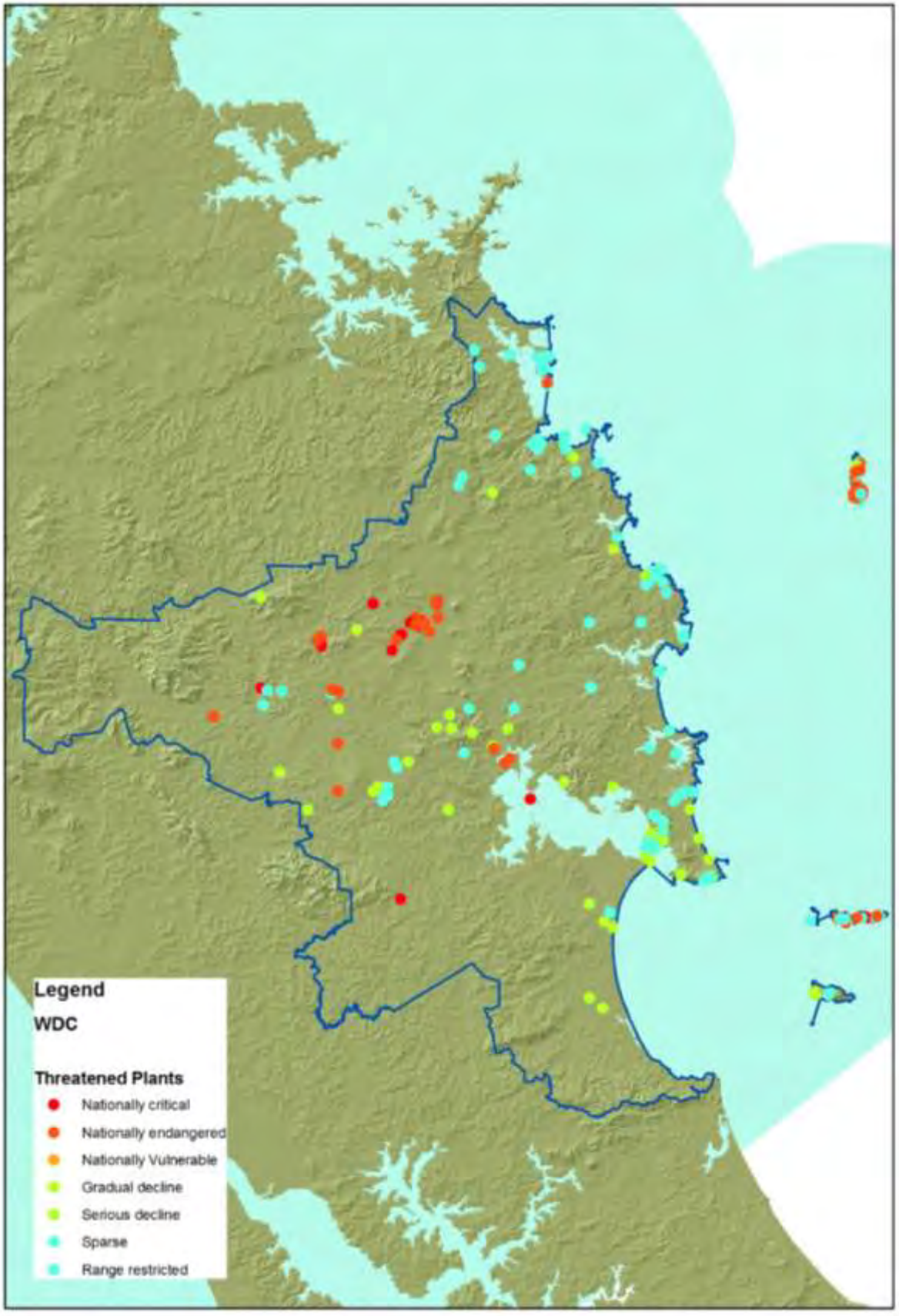

Figure 14: Observations Of Threatened Plant Species Within Whangarei District.

Figure 15 shows the distribution of threatened freshwater fish and koura within Whangarei District. This data was taken from the National Institute of Water and Atmospheric Research (NIWA) New Zealand freshwater fish database. The high priority threatened environments, and information on the order of the waterways, has been overlaid. Those waterways classified as high order are main streams with large upstream catchments with appreciable storage (Snelder et al. 2004). Joy (2009) developed an Index of Biotic Integrity (IBI) to enable between site comparisons nationally. Clear differences were found in relation to land cover. Sites in native vegetation catchments had significantly higher scores and more species than sites in pasture and urban catchments. Analysis of scores over time revealed a significant reduction in average IBI scores, or indigenous freshwater biodiversity, over the past 37 years. The biggest reduction occurred over the last decade, and the biggest declines were at pasture, tussock and urban sites. Exotic forest sites showed no significant change, and there was significant improvement at native forest and scrub sites. The strong association between IBI scores and land use shows the influence degradation of terrestrial systems has on freshwater ecosystems.

Figure 16 shows the distribution of North Island brown kiwi within Whangarei district as taken from a report by Pierce et al. (2006), and Figure 17 shows the distribution of Pateke (brown teal) within Whangarei District as provided by the Department of Conservation. The best source of information on the distribution of other indigenous bird species is the Atlas of Bird Distribution in New Zealand 1999-2004 published by the Ornithological Society of New Zealand (OSNZ). It is currently available in hard copy, and the Society plans to put a web atlas and database on their website www.osnz.org.nz. Electronic data and maps have recently been made available (contact Chris Robertson cjr@wildpress.org). OSNZ supports a web-based repository for ornithological observations www.eBird.org/content/newzealand made in New Zealand. Observers can submit their observations into a permanent archive. All records go through a data verification process to ensure data quality. The NZ Biodiversity Recording System www.nzbrn.org.nz, administered by Landcare Research and Lincoln University, is also a web–based system which provides a secure and robust means of storing, retrieving and displaying natural history observations made in New Zealand. Currently data on birds, plants, fungi, frogs and lizards, mammals, and invertebrates can be entered.

Figure 18 shows the distribution of terrestrial herpetofauna within Whangarei District as provided by the Department of Conservation and the NZ Herpetological Society. The records have been overlaid on Land Cover Database 2 to highlight the habitats these species are utilising (refer to Table 9).

Table 9: Distribution Of Terrestrial Herpetofauna In LCDB2 Classes Within Whangarei District.

Habitat	# Observations	Habitat	# Observations
Indigenous Forest	422	Built-up Area	11
Coastal Sand and Gravel	56	Urban Parkland/Open Space	6
High Producing Exotic Grassland	52	Gorse and Broom	5
Manuka or Kanuka	41	Low Producing Grassland	2
Broadleaved Indigenous Hardwoods	37	Pine Forest – Open Canopy	2
Pine Forest – Closed Canopy	34	Surface Mine	2

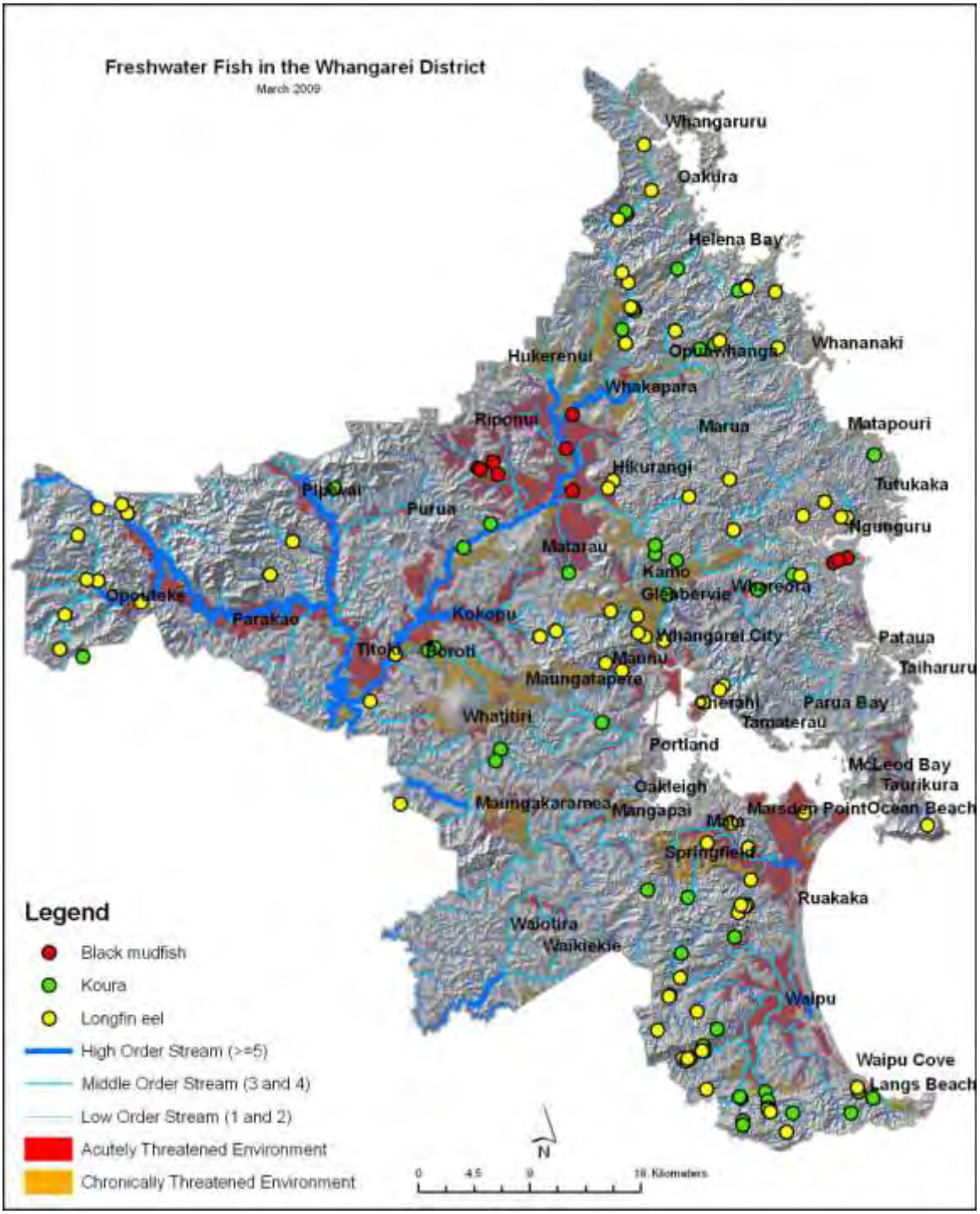

Figure 15: Presence Of Threatened Freshwater Fish Species And Koura Within Whangarei District.

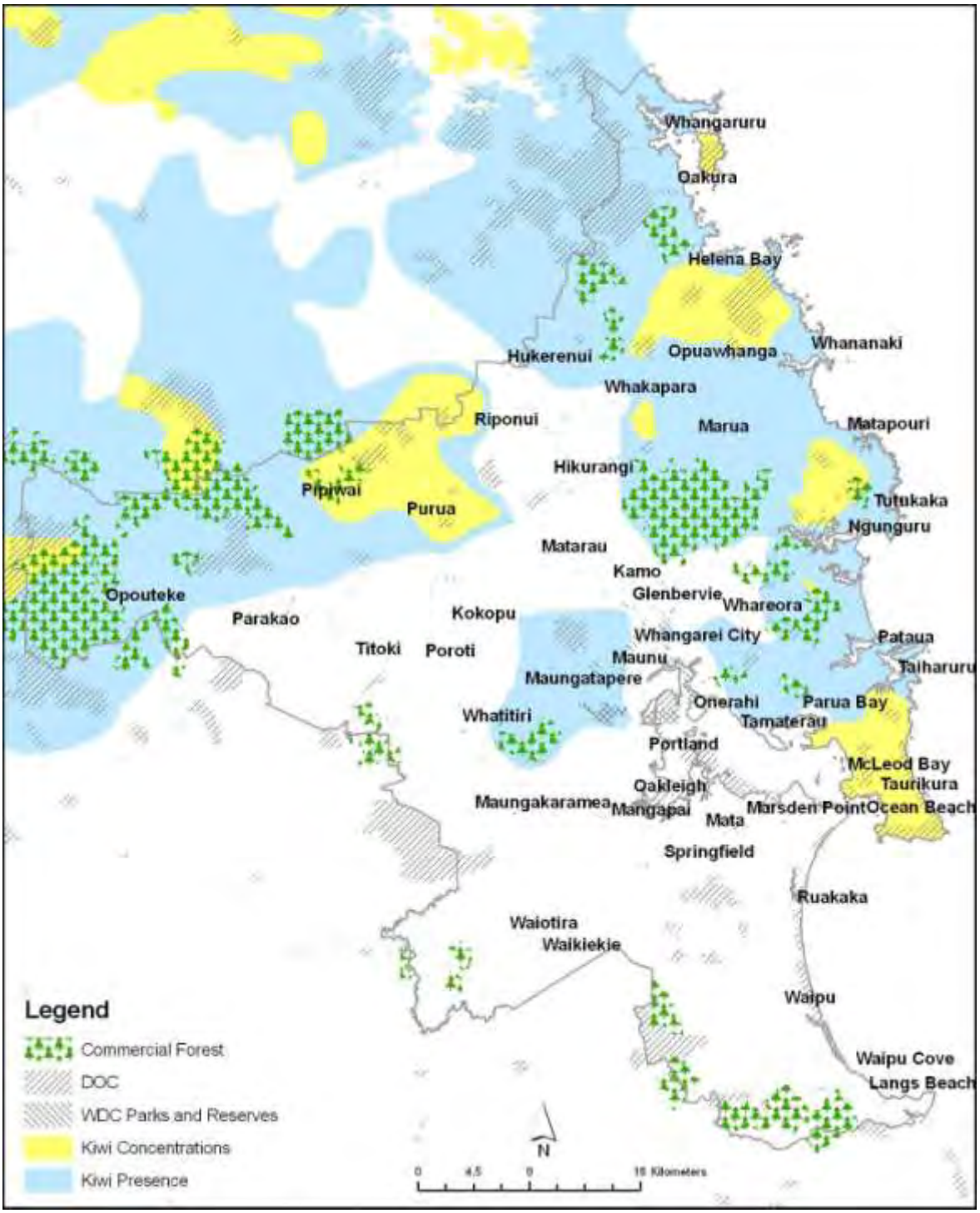

Figure 16: Presence Of North Island Brown Kiwi Within Whangarei District. Source: Pierce et al. (2006).

Figure 17: Distribution of Pateke (Brown Teal) Within Whangarei District.

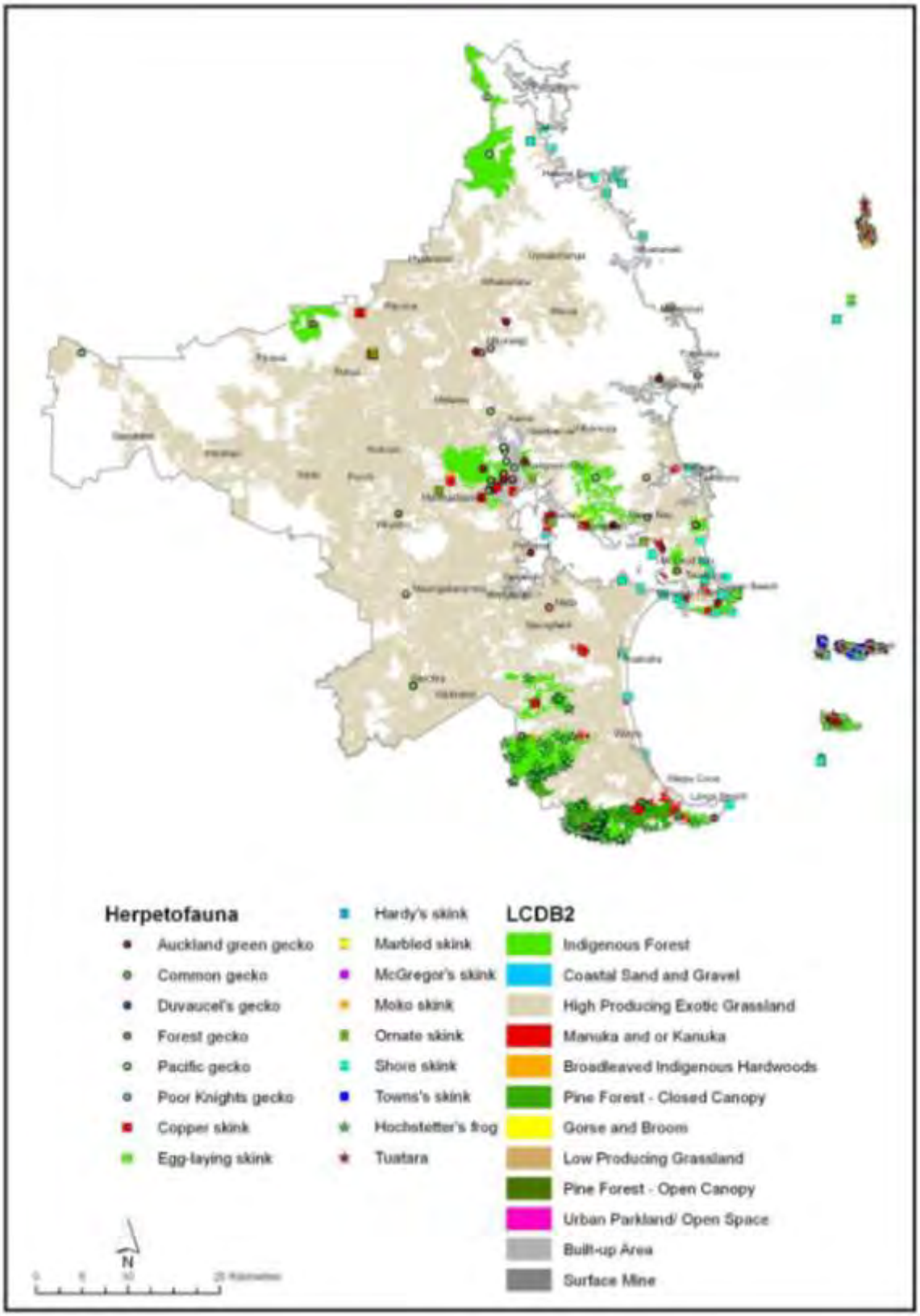

Figure 18: Distribution Of Terrestrial Herpetofauna Within Whangarei District. Source: Department of Conservation and New Zealand Herpetological Society.

3.2.3 Status/Trend

There is little information on the status of threatened species within the district, with the exception of those receiving active management. This is due to resource limitations which results in an absence of monitoring. In the absence of active management all populations of threatened species are at best stable, but more likely in decline.

New Zealand Fairy Tern - Tara Iti

Nationwide estimates of the total population of New Zealand fairy tern are 35-40 individuals. In 2008/09 there were 11 breeding pairs, and they fledged five chicks (Table 10). New Zealand fairy tern breed at only four sites: Mangawhai, Waipu, Pakiri, and Papakanui. The proportion of the New Zealand fairy tern population attempting to breed each year is low (average of 43%), and the proportion of eggs hatching each season is low (average 38%) (Ferreira et al., 2005). Chick survival to fledging is high at 63%, but recruitment into the breeding population is low with only 32.7% of the 55 birds banded between 1991 and 2003 attempting to breed. The factors limiting recruitment to the breeding population are currently unknown. Adult survival is high at 95%, and the average life-span is currently determined as at least six years. Demographic modelling currently predicts the population to be increasing at about 1.5% per annum (Ferreira et al., 2005).

Table 10: Status Of NZ Fairy Tern Population Over The Last Five Years.

Year	Breeding Pairs	No. Chicks Fledged
2004/05	8	3
2005/06	12	7
2006/07	13	8
2007/08	12	7
2008/09	11	5

Brown Teal/Pateke

There are approximately 1,000 Pateke nationally, concentrated in two remnants, on Great Barrier Island and in eastern Northland centred on Mimiwhangata. As the species is very discrete it is difficult to get a total count of the numbers. At Mimiwhangata and Teal Bay on the east coast of Northland the population declined by 65% in the period between 1988 and 2001 to approximately 100 individuals. Numbers have been increasing as a result of management over the last eight years, and is believed to have been reasonably stable over the last five years. Population trend counts at flock sites are completed four times per year. The average count in 2009 was 450 (see Figure 19).

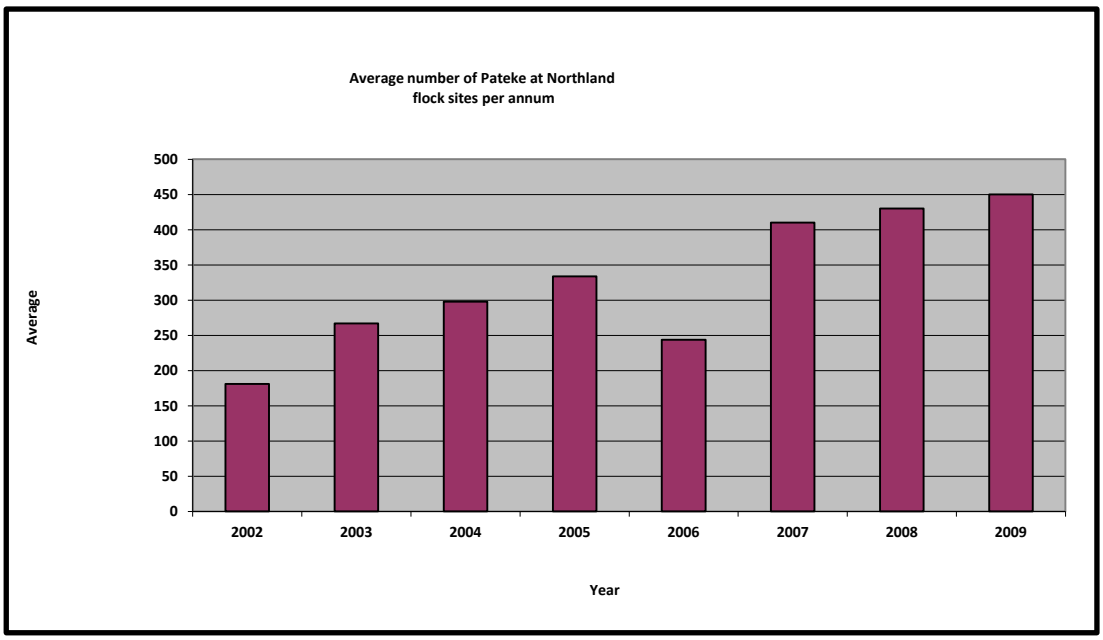

Figure 19: Average Number Of Pateke At Northland Flock Sites Per Annum.

Northern New Zealand Dotterel

The last census of NZ dotterel was undertaken in 2004, and the population was estimated at 1701 individuals or c. 700 pairs. The east coast of the North Island holds 83% of the population of the northern sub-species, including all managed sub-populations. In October 2004 approximately 10% of the population was located within Whangarei District. There was one 'key' site according to the criteria in the New Zealand Dotterel Recovery Plan (Waipu). The New Zealand Dotterel Recovery Plan recommends maintaining full management at this breeding site, which is also a site of national importance. It is the only site receiving active management by the Department of Conservation. Other sites within Whangarei District with important numbers of Northern New Zealand dotterel were; Bland Bay (16), Ngunguru Estuary (12), Kauri Mountain Beach (12), and Kumi Point-Horahora River (10). The population status of NZ dotterel is management dependent and significant declines begin immediately when management ceases due to low breeding success.

North Island Brown Kiwi

The overall population of North Island brown kiwi in the Whangarei Kiwi Sanctuary is estimated to have increased by 69% from 500 in 2001 to 845 in 2008. There is high adult mortality (6.8%) which equates to a life expectancy of only 14.7 years. This life expectancy is only about 35-50% of its potential, based on adult survival rates in other kiwi sanctuaries. This difference is attributed to predation by dogs. In addition to natural recruitment, the Bank of New Zealand Operation Nest Egg Programme which ran in the Sanctuary returned over 50 sub-adults to the Sanctuary and 44 for the establishment of a new population at Tawharanui. This is a predator-fenced area managed by the Auckland Regional Council near Warkworth. An estimate of the total number of breeding pairs in the Sanctuary is not available.

Other Birds

The State of New Zealand's Birds (2008) Special Report Conservation of Birds on the Mainland, by the Ornithological Society of New Zealand shows that here is a continued reduction in the range of many endemic species, and an increase in the distribution of many introduced birds. The most commonly seen birds in New Zealand today are species deliberately introduced by European settlers, or which have colonised New Zealand by their own powers of dispersal in the wake of wide scale habitat change. Almost all bird species belonging to orders or families endemic to New Zealand remain at risk of extinction. Threatened and endangered species which are being actively managed by the Department of Conservation are holding their own, and most have increased in distribution. However other endemic species urgently require management to arrest declines.

The atlas draws attention to three groups of birds whose distributions need to be monitored:

1. *Native species that are in decline and require urgent conservation action*. This includes; Pateke (brown teal), kaka, and long-tailed cuckoo.
2. *Endemic species that are under management*. Most species in this group are increasing but management needs to continue. This includes; North Island brown kiwi, New Zealand dotterel, and New Zealand fairy tern.
3. *Introduced and recently colonised species that have significantly increased their range of established wild populations*.

Hochstetter's Frog

There is no data available which will allow a comprehensive assessment of changes in the population of Hochstetter's frog because historic methods of detection, and the information gathered on habitat and other variables, were too limited. Detection probabilities are low so on any single occasion the number of frogs found is a lot lower than the total population. There is no data to indicate expansion or contraction in range. There are indications that the frogs may actually be more at risk in future if rainfall events cause siltation of water courses. No frog habitat is being protected from introduced threats on an ongoing basis.

Black Mudfish

Limited information is available on the status or trend of black mudfish in Whangarei District as they are not receiving management. A monitoring project for black mudfish has been carried out by NorthTec since 2006 in the Wairua River Wildlife Management Reserve. The focus of the research is on obtaining an estimate of population size and determining the use of different habitats by the mudfish. *Gambusia* or mosquitofish, an introduced aquatic pest, are also being monitored as there is some evidence they are having an adverse effect on mudfish recruitment. Results of the research are not yet available.

Threatened Invertebrates

Minimum population size estimates for *Placostylus hongii, Amborhytida tarangiensis*, and Turbott's weevil are 1,500, 100,000 and 350 respectively.

Plant - Hebe aff. bishopiana

Hebe aff. bishopiana is located at three sites; Wairua River Government Purpose Wildlife Management Reserve, Tanekaha Pumping Station (Borrow Cut Wetland), and Matarau Island Scenic Reserve. Census results indicate approximately 200 individuals are present.

Plant - Pittosporum obcordatum

The *Pittosporum obcordatum* population number less than 1,000 individuals, and regeneration has not been seen for 10 years (Lisa Forrester, Northland Regional Council, *pers. comm*.) The species is located at one sites; Wairua River Government Purpose Wildlife Management Reserve.

4. Protected Areas

There are nine types of formally protected areas within Whangarei District, including: public conservation land managed by the Department of Conservation, Northland Regional Council Community Pest Control Areas, Whangarei District Council Reserves and Conservation Covenants, QEII Open Space Covenants, Nga Whenua Rahui Kawenata, Fish and Game Wetlands, and a New Zealand Forest Restoration Trust Reserve. They cover a total of 24,698ha, and Figure 20 shows the distribution within Whangarei District.

Table 11: Formally Protected Areas Within Whangarei District.

Organisation	Type	Area (ha)	% Protected Areas	% of District
Department of Conservation	Reserves	17,695	71.2	6.5
Northland Regional Council *	Community Pest Control Areas	1,144	4.6	0.4
Whangarei District Council **	Reserves (Parks) Conservation covenants	2,318 1,178	9.4 4.8	0.9 0.4
QEII	Conservation covenants	2,054	8.3	0.8
Nga whenua rahui	Kawenata	10	Less than 0.1	Less than 0.1
Fish and Game ***	Wetlands	56	0.2	Less than 0.1
NZ Forest Restoration Trust	Reserve	242	1.0	Less than 0.1
Total		**24,698**	**100%**	**9%**

* Plus 641ha of NRC owned land
** Plus 3,915ha of Council owned land
*** Plus 20ha leased from WDC

4.1 Public Conservation Land (Department of Conservation)

4.1.1 Reserves

There are 17,695ha of public conservation land managed by the Department of Conservation in the Whangarei District, which represents 6.5% of the land area. The land is covered by nine different designations (see Figure 21). The smallest are Marsden Bay Conservation Area (99.76m^2) and Waiarohia Marginal Strip (106.98m^2). Some of the largest areas within Whangarei District include: part of the Russell Forest (Northland Conservation Park - 1,861ha), part of the Mareretu Forest Conservation Area (1,167ha), Kaiikanui Forest (1,116ha), Mangakahia Forest Conservation Area (916ha), Hen and Chickens Islands Nature Park (858ha), Mimiwhangata Coastal Park Scenic Reserve (830ha), part of the Marlborough Forest (Northland Conservation Area) (822ha), part of the Ngaiotonga Scenic Reserve (708ha), Motatau Scenic Reserve (644.8ha) and Pukenui Forest (592.6ha).

4.1.2 Nga Whenua Rahui Kawenata

Nga Whenua Rahui kawenata are voluntary covenants for the protection of indigenous ecosystems on Maori land. They are funded by the Nga Whenua Rahui Fund. There are two within Whangarei District - Te Takiwa O Waimarie/Waipao and Poroti-Moera; they are both located at Poroti and cover 10ha.

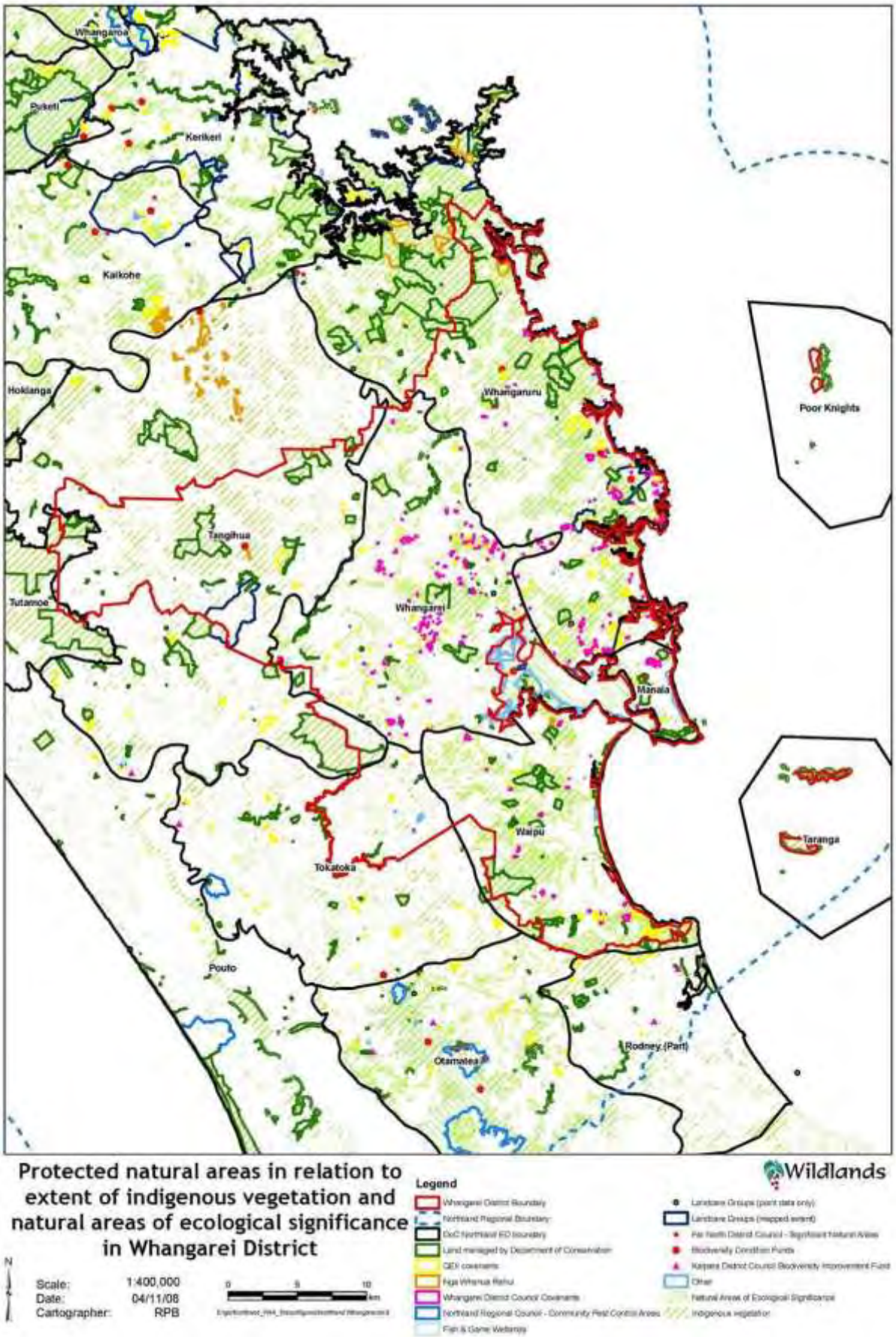

Figure 20: Formally Protected Areas Within Whangarei District. Source: Wildland Consultants Ltd.

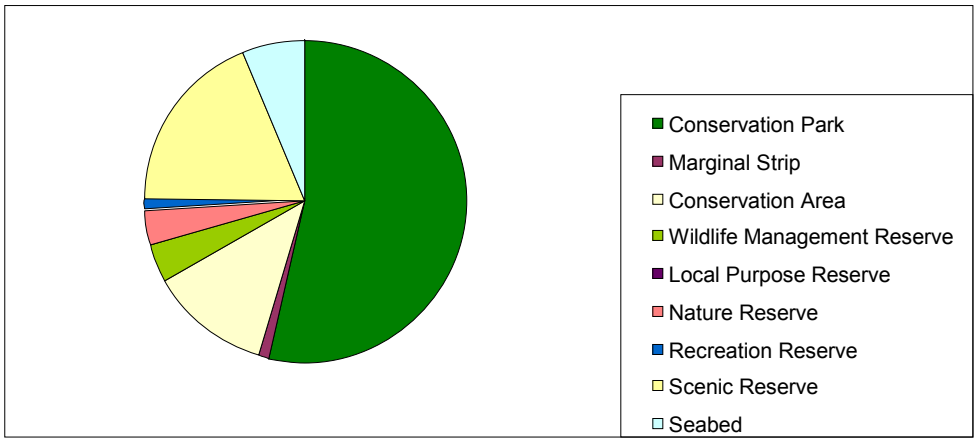

Figure 21: Designations Of Public Conservation Land Within Whangarei District.

4.2 Whangarei District Council

4.2.1 Whangarei District Council Reserves

The Whangarei District Council manages 6,233ha of land for a variety of purposes (see Figures 22 and 23). The smallest is 0.002ha for river control purposes at Hukerenui. The largest, and only two over 100ha, are local purpose reserves for water supply at Pukenui (408ha, 241ha). Approximately 2,318ha (37.2%) of Council land is managed by the Parks Department.

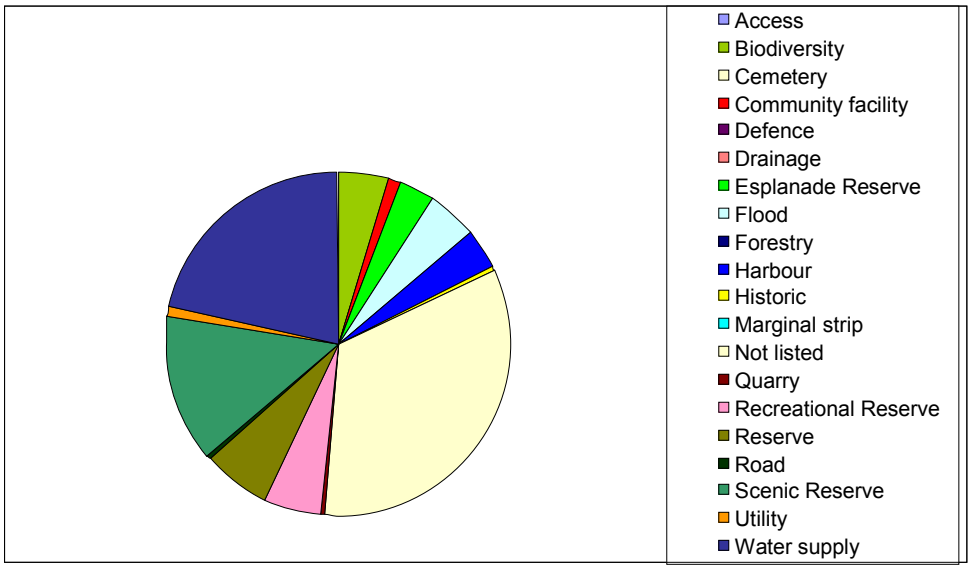

Figure 22: Purpose of Legally Protected Land Managed By Whangarei District Council.

4.2.2 Conservation Covenants

There have been 778 conservation covenants established on private property under the Reserves Act (1977) within Whangarei District as at 1 January 2009 (see Figure 24). These cover 1,178.5ha. The smallest conservation covenant is 5m^2, and the largest 58ha, with an average size of 1.5ha.

N.B. There is a time delay between when land is surveyed for a conservation covenant and the date a plan is deposited as landowners have five years to enact a resource consent granted for subdivision. There is also a time delay between the deposition date of the plan and when the data is entered into Council's database.

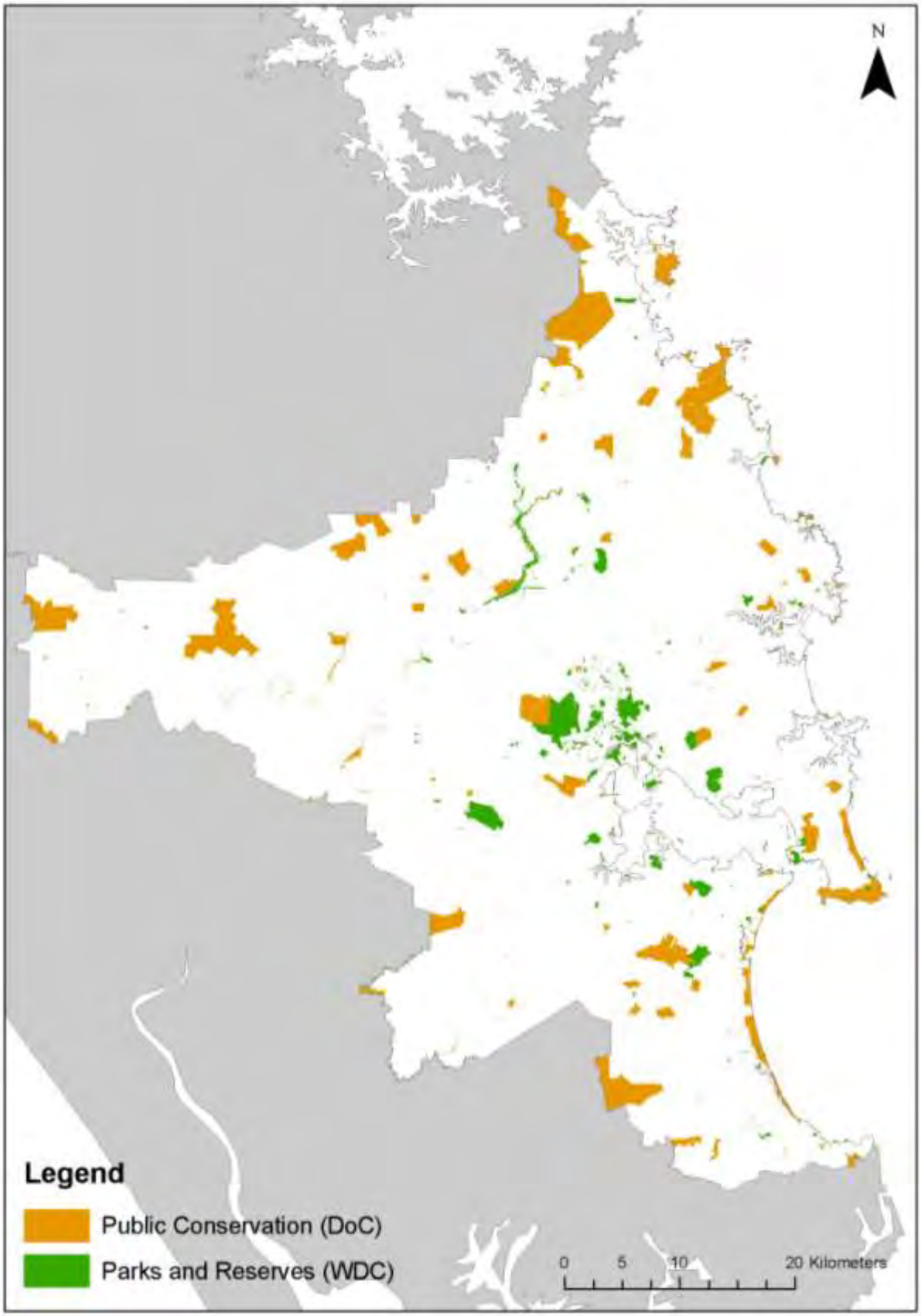

Figure 23: Public Conservation Land (DoC) And Parks And Reserves (WDC) Within Whangarei District.

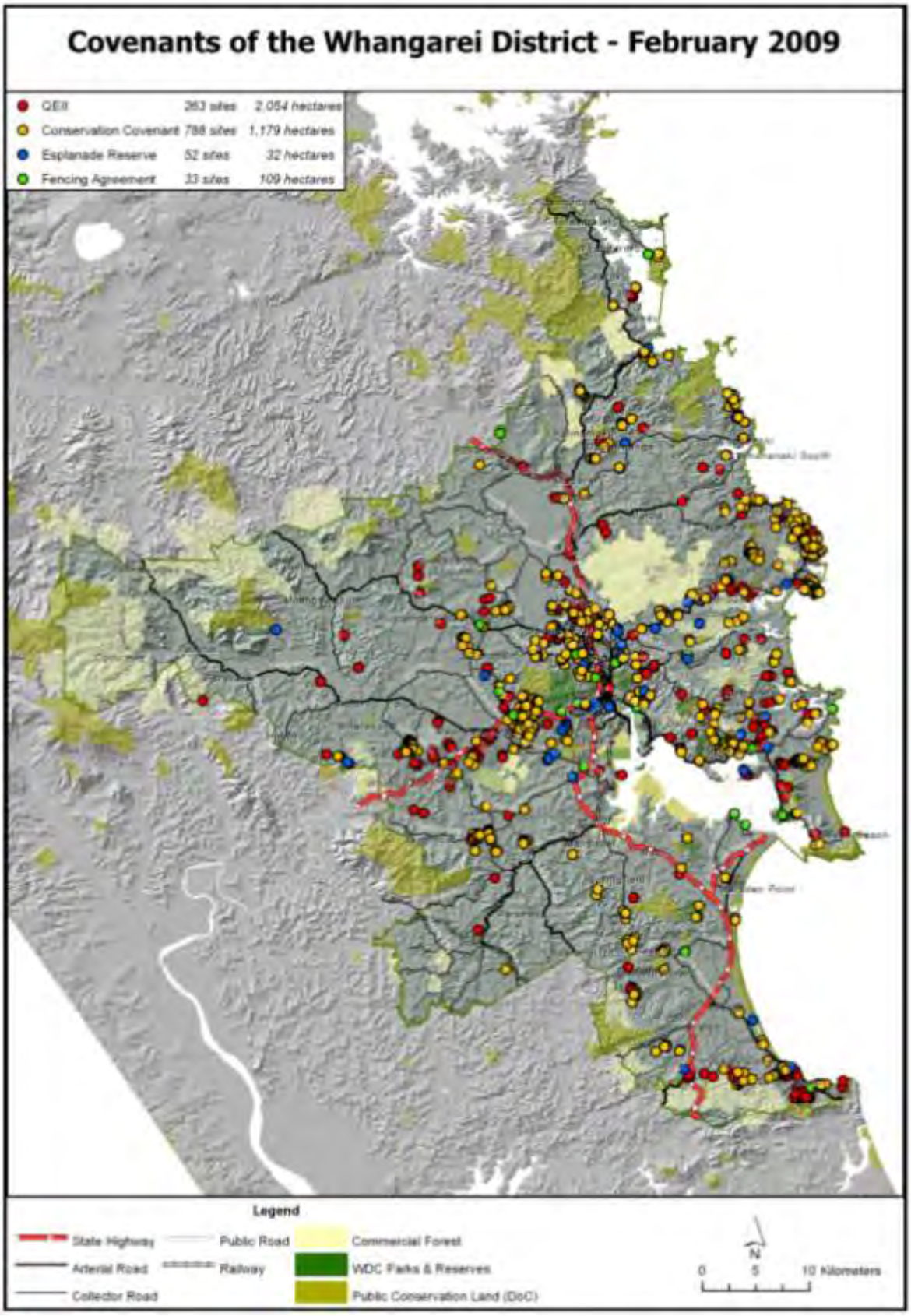

Figure 24: Conservation Covenants within Whangarei District.

The number of conservation covenants registered increased in the 1990s to peak at 96 in 2000. This was followed by a decline, although numbers remained between 42-66 from 2001 to 2007, with the exception of a sharp decline to 19 in 2004 (see Figure 25). The data for 2008 has not been analysed as it is incomplete.

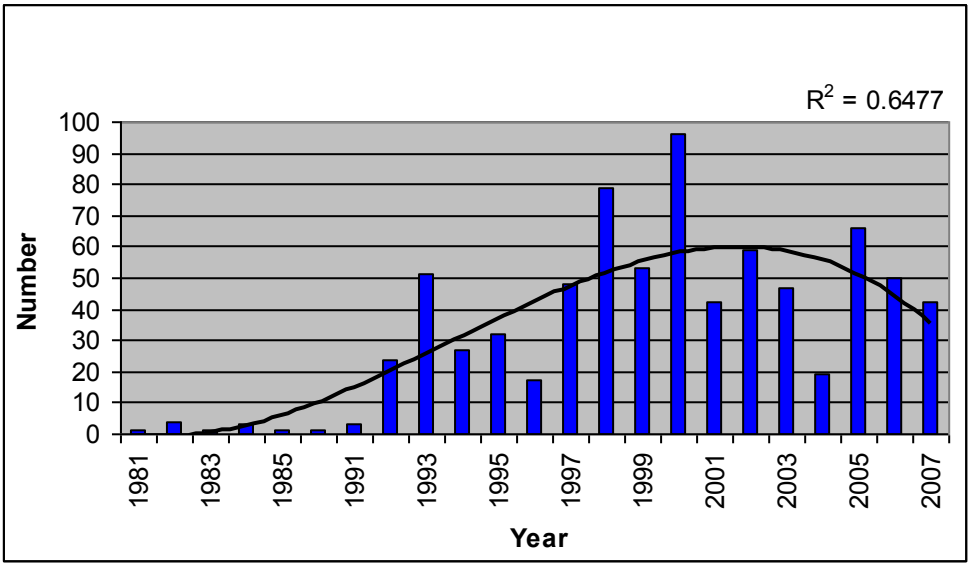

Figure 25: Number Of Conservation Covenants Registered Per Year.

The number of hectares of land registered for conservation covenants has peaked twice at 109ha in 1997 and 139ha in 2003. Both peaks were followed by a decline in the number of hectares covenanted (see Figure 26). The least number of hectares covenanted in any given year over the last 10 years of data (1997-2007) was 45ha in 2005. However, since 2005 there has been a steady increase in the number of hectares covenanted.

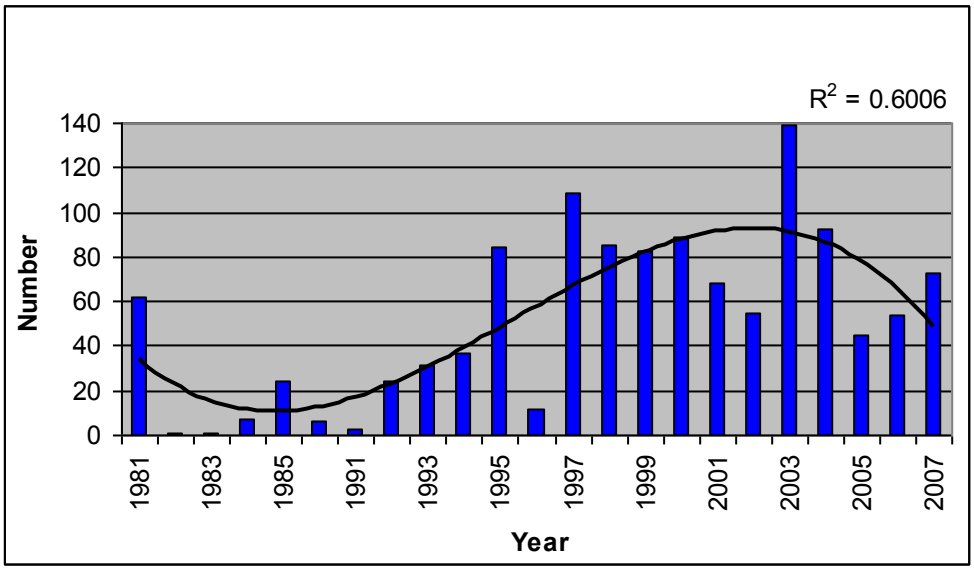

Figure 26: Number Of Hectares Registered For Conservation Covenants Per Year.

4.3 QEII National Trust Open Space Covenants

An open space covenant is a voluntary, legally binding land protection agreement registered on the title of the land. There have been 263 open space covenants established with the Queen Elizabeth II National Trust (QEII) in the Whangarei District as at 1 January 2009 (see Figure 24). These cover 2,054ha. The smallest covenant is 500m^2, and the largest is 417ha, with an average size of 13.6ha.

The number of open space covenants registered with QEII increased to peak at 46 in 2006 (Figure 27). The trend indicates the number of covenants registered per annum will continue to rise, although this is likely linked to the level of development in the district.

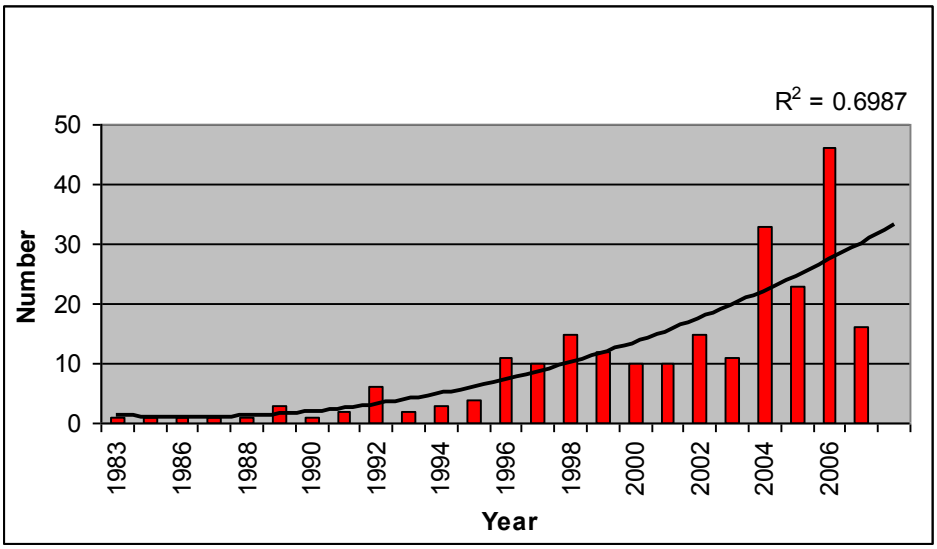

Figure 27: Number Of Open Space Covenants Registered Per Year.

The number of hectares of land registered for open space covenants peaked at 417ha in 1990 (the result of one covenant) and 263ha in 1992. For four out of the last eight years of data (2000-2007) the number of hectares covenanted per year has been over 100ha (Figure 28).

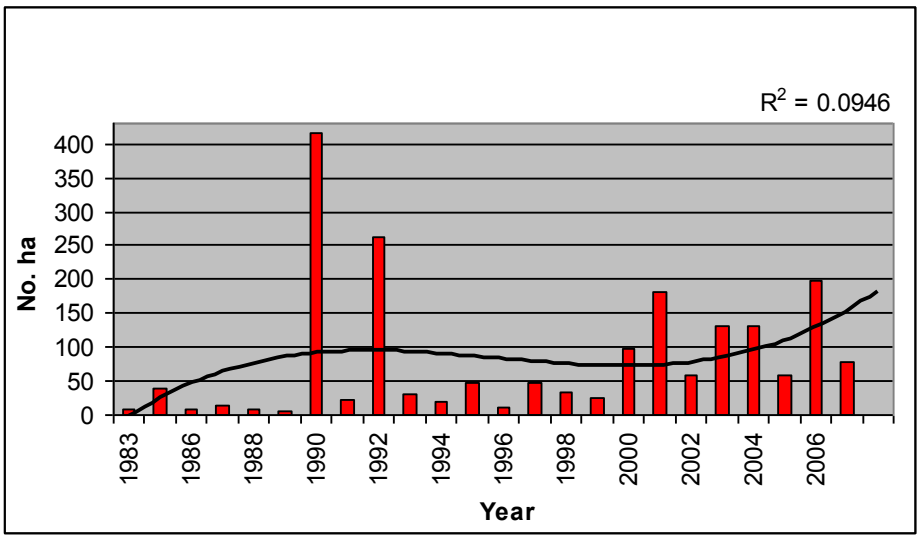

Figure 28: Number Of Hectares Registered For Open Space Covenants Per Year.

Historically, a greater number of covenants were registered per annum with Whangarei District Council than QEII. This trend was reversed in 2006 when a greater number were registered with QEII, and continued in 2007. Also similar sized areas were registered per annum for both types of covenants, with the exception of two spikes in 1990 and 1992 for QEII. Since 2001 a greater number of hectares have been covenanted with QEII than Whangarei District Council.

There are 1,026 covenants (conservation, open space, kawenata) within the district at the time of writing. The majority of these were created between 1997 and 2007, when the number registered per annum ranged from 52 to 106 (see Figure 29).

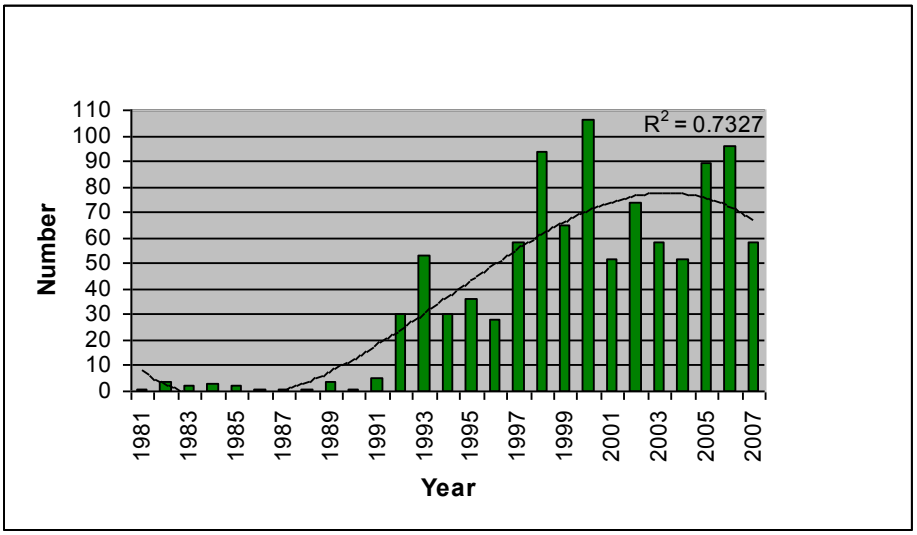

Figure 29: Total Number Of Covenants Within Whangarei District.

The covenants cover 3,242.5ha or 1.2% of the district area. The largest number of hectares (417) was covenanted in 1990 as a result of a single block being registered. For the ten year period from 1997 to 2007 the number of hectares covenanted per year ranged from a minimum of 103ha to a maximum of 270.6ha (Figure 30).

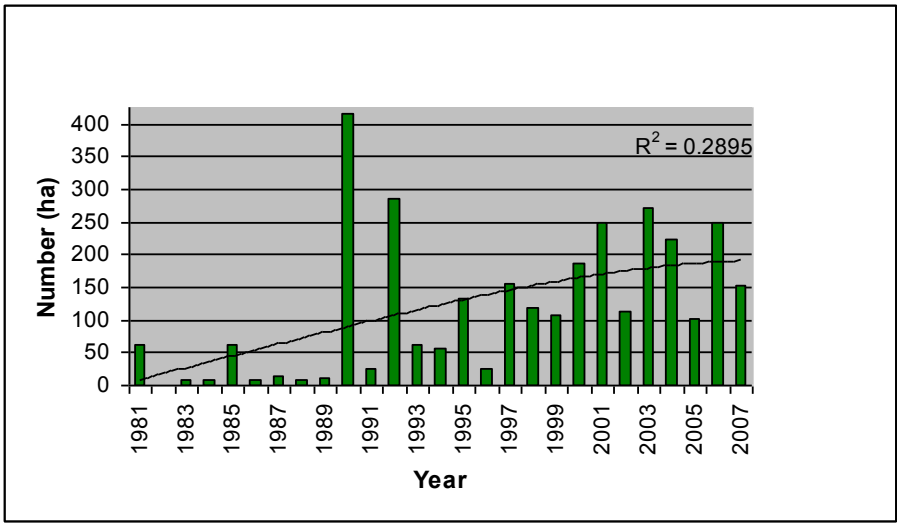

Figure 30: Total Number Of Hectares Under Covenant Within Whangarei District.

Over the last ten years, the number of conservation covenants being registered has increased. This is largely a result of an increased level of development within the district, and the greater availability of information on which to assess the potential environmental impacts of development i.e. Protected Natural Area reports, Threatened Environments, etc. Covenanting areas of indigenous vegetation is a primary mechanism for mitigating the environmental impacts of subdivision. In 2007 an Environmental Benefit provision was included in the District Plan which allows for the creation of an additional allotment during subdivision in the Countryside and Coastal Countryside Environments in return for the permanent protection of a significant natural feature (Section 73.3.2 of the District Plan). It is likely the increase in environmental consciousness within the community supports the creation of new covenants.

The increase in the number of Open Space Covenants registered with QEII, and the corresponding decrease in the number of conservation covenants registered with the Whangarei District Council, could be explained by the different nature of the two organisations, and the level of support offered to landowners. QEII is a non-government organisation which is not seen by the community as political or regulatory. There are three QEII regional representatives in Northland, one of whom is based in Whangarei, who provide landowners with ongoing advice and support. A management plan is often developed with the landowner for an open space covenant when it is established. This plan sets out objectives and provides guidance on such aspects as threatened species management, pest control and restoration methods. The QEII regional representatives visit each covenant regularly, a minimum of every 2 years, to monitor its condition, identify and address any threats, and advise the owner about how to meet the covenant objectives. The Whangarei District Council contributes $30,000 to QEII per annum to support the establishment of QEII Open Space Covenants within the District.

The Northland region contains the highest number of QEII Open Space Covenants nationally with 429 (see Figure 31). Of these 252 (58.7%) are within Whangarei District. In comparison the region with the least is Nelson with 8. The average size of conservation covenants in Northland (15.5ha) is the second smallest nationally, and similar in size to bottom ranked Taranaki (15.3ha). In comparison, the average size in Otago is 65.3ha, the largest nationally.

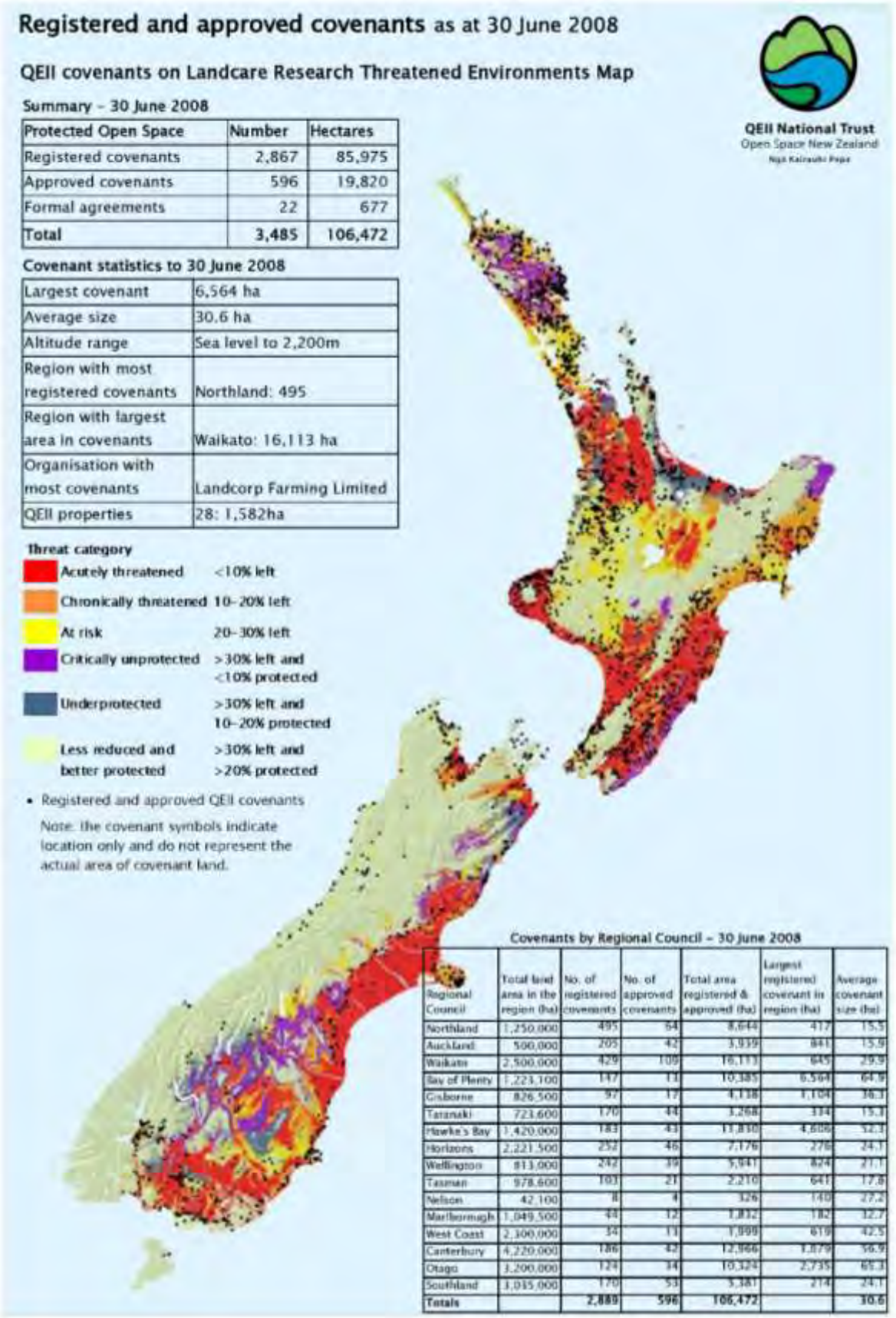

Figure 31: Registered And Approved Open Space Covenants.

4.4 Northland Regional Council Community Pest Control Areas (CPCA's)

One of the aims of the Regional Pest Management Strategy (RPMS) produced by Northland Regional Council is to encourage the community to become involved in integrated pest management. Community Pest Control Areas (CPCAs) can be established in areas which have been identified by the community as worth protecting, and assessed as having high ecological value.

A management plan sets out objectives, methods, and the level of control to be achieved for those pest animals and plants which have been identified as threatening the values of the area. The pest species are selected from the Northland RPMS (see Appendix A) and the National Pest Plant Accord* (see Appendix B). The proposed costs to landowners, and the level of Council support required, are identified.

Council staff or contractors complete the initial pest control free of charge to reduce pest numbers to a level the group of landowners can manage. The Council may also supply traps, agrichemicals, poisons and monitoring equipment for a period of two years free of charge, followed by a further two years at 50% of cost price. Maintenance of pest numbers is the responsibility of individual landowners but may be assisted or co-ordinated by a community group. The Northland Regional Council audits the standard of pest control to ensure the required standards are being achieved.

There are four Community Pest Control Areas within Whangarei District. These cover 1,144ha and involve 183 land owners.

Table 12: Community Pest Control Areas Within Whangarei District.

Location	Benefit Area (ha)	Indigenous Area (ha)	No. of Owners	Year Established
Manganese Point	121.2	29.3	109	2005
Pataua North	778.6	140	26	2008
Tutukaka	230.7	52	34	2006
Whananaki	13.9	2	14	2006
Total	**1,144.4**	**223.3**	**183**	

* The National Accord is a co-operative agreement between the Nursery and Garden Industry Association, Regional Councils, and Government Departments with biosecurity responsibilities. All plants on the NPPA are unwanted organisms under the Biosecurity Act 1993. These plants cannot be sold, propagated or distributed in New Zealand.

4.5 Fish and Game New Zealand Wetlands

Fish and Game New Zealand is an angler and game bird hunter organisation which has a statutory mandate to manage New Zealand's freshwater sports fisheries and game bird hunting. Fish and Game New Zealand manage two wetlands within Whangarei District.

The Bissett Wetland, owned by the Northland Fish and Game Council, is located on the banks of the Wairua River, approximately 1km upstream of the confluence of the Mangakahia and Northern Wairoa

Rivers. The property is 56ha of human made wetland managed as a game bird hunting area and for biodiversity values. The Fish and Game Council is currently establishing a QEII Covenant over the property.

The Borrow Cut Wetland is 1.5km upstream of the Jordon Valley bridge which crosses the Wairua River. It is a marginal strip managed by the Whangarei District Council and leased to Northland Fish and Game for the enhancement and creation of game bird habitat, and providing hunting opportunities on Crown land. The lease was agreed to by the Council in 1999, and renewed in 2005 for five years. The property covers 20ha.

4.6 New Zealand Native Forest Restoration Trust Reserve

The New Zealand Native Forest Restoration Trust is a leading non-government organisation involved in forest restoration in New Zealand. Since 1990 the Trust has acquired land to protect important species, restore habitats and improve the quality of our waterways. It has 25 reserves throughout the North Island covering a total of nearly 6,000ha. The NZ Native Forest Restoration Trust own and manage the William Upton Hewett Memorial Reserve north-west of Whangarei between Pipiwai and Titoki. It is a 242ha regenerating shrubland with a large kahikatea swamp along the western stream boundary.

4.7 Protected Area Network-New Zealand

Landcare Research is developing a protected areas network (PAN-NZ) database of legally protected land in New Zealand where native species and ecosystems remain dominant. Within New Zealand formally protected areas include public conservation land, regional parks, a range of covenant schemes (Nga Whenua Rahui, Nature Heritage Fund, Queen Elizabeth II National Trust, and the Reserves Act) and local council reserves.

5. Areas Receiving Active Management

5.1 Public Conservation Reserves

The Whangarei Area of the Department of Conservation's Northland Conservancy (N.B. this area differs from the legal boundary administered by Whangarei District Council) contains 30,972ha of public conservation land (L. Wells, Department of Conservation, *pers. comm.*). Only a small proportion of this is actively managed for the protection of biodiversity values. To prioritise management, ecosystems are ranked, and this data coupled with information on the distribution of threatened species, determines which reserves will receive management. Animal and plant pest control are the primary tools utilised to protect biodiversity. Fencing, captive breeding and wild release, and translocation of wild individuals to establish new populations, are also tools being utilised.

Historically possum control was carried out at nine sites within the Whangarei Area of the Northland Conservancy. However, five of these sites no longer receive treatment. For the past four years the area under sustained management long term (AUSM) has remained steady, covering 10.1% (3,136ha) of public conservation land in 2008/09, including Bream Head, Manaia, Whangaruru, and Mimiwhangata (see Figure 32). The treatment area in any given year has also remained relatively stable at 8.1% (2,746ha) of public conservation land in 2008/09, although there was a sharp decrease in the number of hectares treated in 2003/04 and 2006/07.

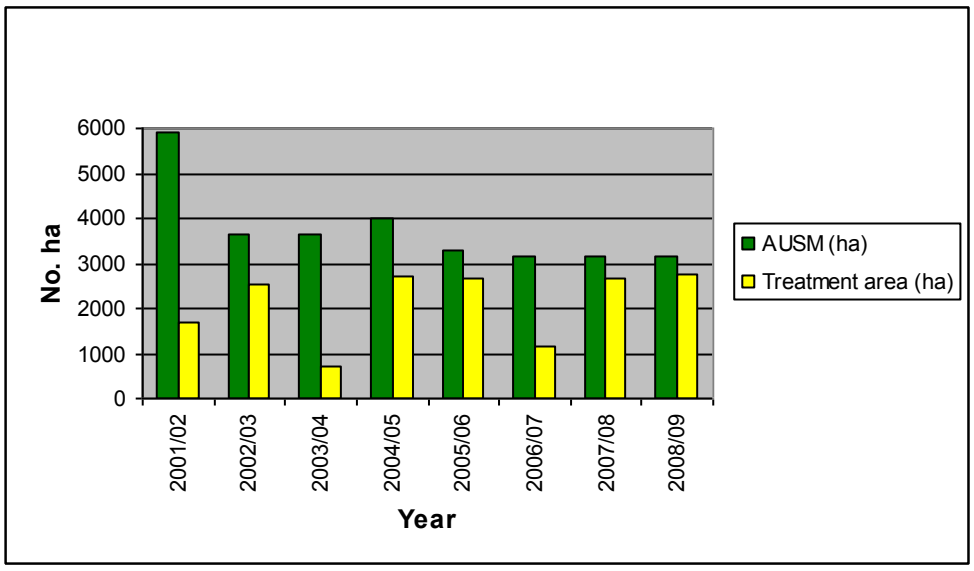

Figure 32: Number Of Ha Of Possum Control In Department of Conservation's Whangarei Area Per Year.

Prior to 2005/06 the feral goat control programme was managed on a Northland-wide basis. Historically goat control was carried out over a greater proportion of the Department of Conservation Whangarei Area, but two large forested areas, Russell and Kaiikanui, no longer receive management. For the past four years the AUSM has been declining, and covered 3.8% (1163ha) of public conservation land in 2008/09 (see Figure 33). The sites receiving control include; Motatau, Mimiwhangata, Purua and Maungatapere. The treatment area has varied annually, and covered 2.6% (800ha) of public conservation land in 2008/09.

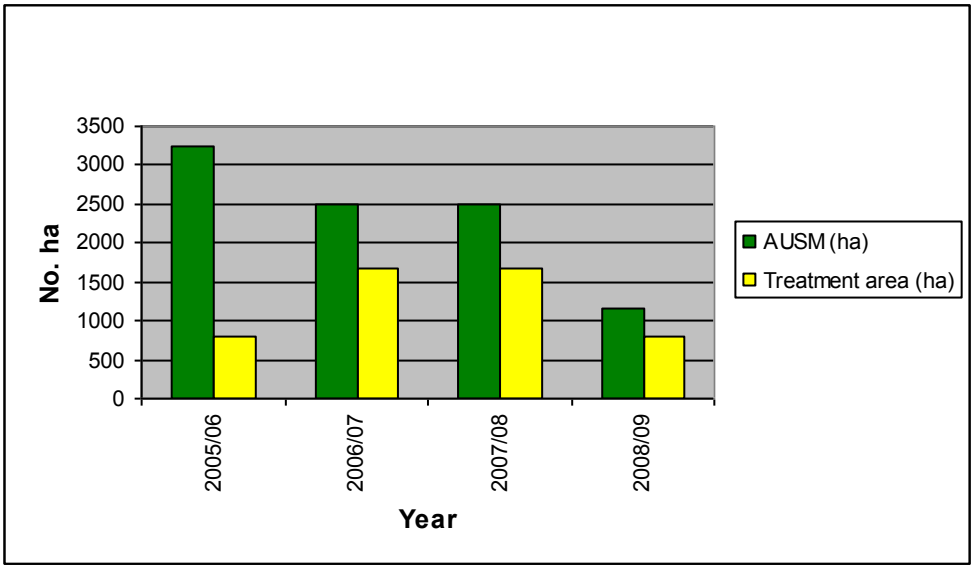

Figure 33: Number Of Hectares Receiving Goat Control In Department of Conservation's Whangarei Area Per Year.

The AUSM, and the area where Argentine ants are controlled on an annual basis are the same. In 2002/03 and 2003/04 15ha was treated, and in subsequent years 17ha was treated at Ocean Beach and Urquharts Bay.

A region-wide plan to remove wild deer and minimise farm escapes was launched 11 years ago. It is funded by the Animal Health Board, Northland Regional Council and the Department of Conservation, and supported by the local Regional Animal Health Committee and deer farmers. The Northland Deer Response Team work with deer farmers to help recover escaped stock, eliminate those which cannot be recovered, and minimise escapes from the farm by checking perimeter fences. In 2007/08 in Northland there were 18 confirmed escape events involving 13 deer farms, out of a total of 46 in operation in the region. This equates to escape events occurring on 28% of farms, the highest proportion during the 11 years of the programme. Two hundred and thirty six animals were documented as being at large and targeted by the Response Team. Of these 152 were recaptured, 50 were eliminated, and 34 remained unaccounted for. Hunting of the wild population of sika deer liberated into Russell Forest in the early 1980s is ongoing by the Response Team. Within Whangarei District there are 22 deer farms. Problem areas for farm escapes include Ruatangata and Mangakahia.

Historically pest plant control was carried out at 10 sites. For the past five years the AUSM has remained steady, covering 16% (4,965ha) of public conservation land in 2008/09, including Hikurangi Swamp, Hen and Chickens Islands, Poor Knights Islands, Mt Manaia, Bream Head, and Whangarei Harbour. However the Bream Islands, Otakairangi Swamp, Wairua Swamp, Manganui River no longer receive treatment. The annual treatment area halved from 2005/06 to 2006/07 but remained stable at 7.5% (2309ha) of public conservation land for the next three years (see Figure 34).

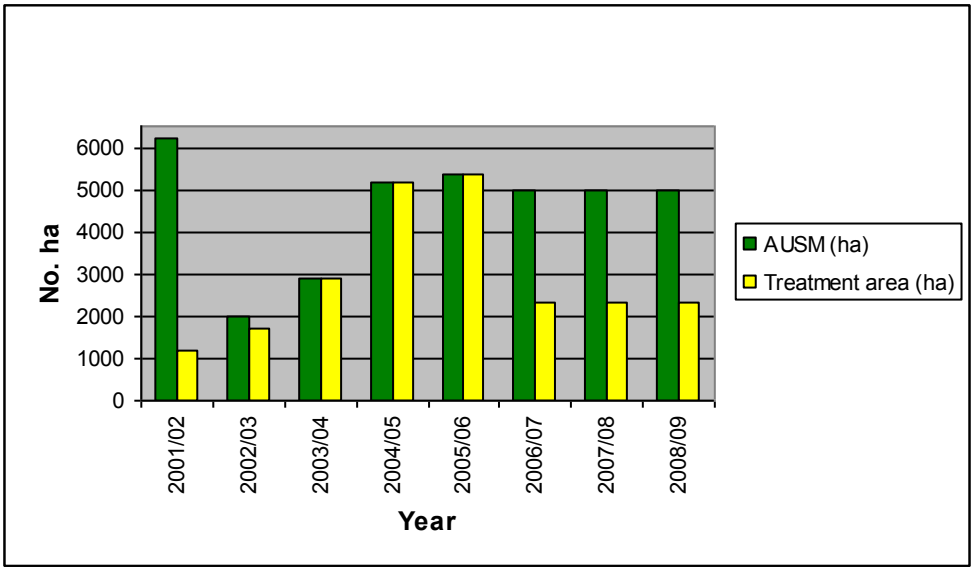

Figure 34: Number of Hectares Receiving Pest Plant Control In Department of Conservation's Whangarei Area Per Year.

The number of weed-led control operations increased five-fold between 2001/02 and 2004/05, likely due to the discovery, or change in status, of new high priority pest plants. These plants are controlled by the Department of Conservation regardless of land tenure. The number of weed-led control operations has remained steady for the last five years. The list of pest plants targeted includes: dusky coral pea, Himalayan fairy grass, mickey mouse plant, mile a minute, billy goat weed, kangaroo acacia, forkleaf hakea, chocolate vine, climbing spindleberry, and yellow flag iris.

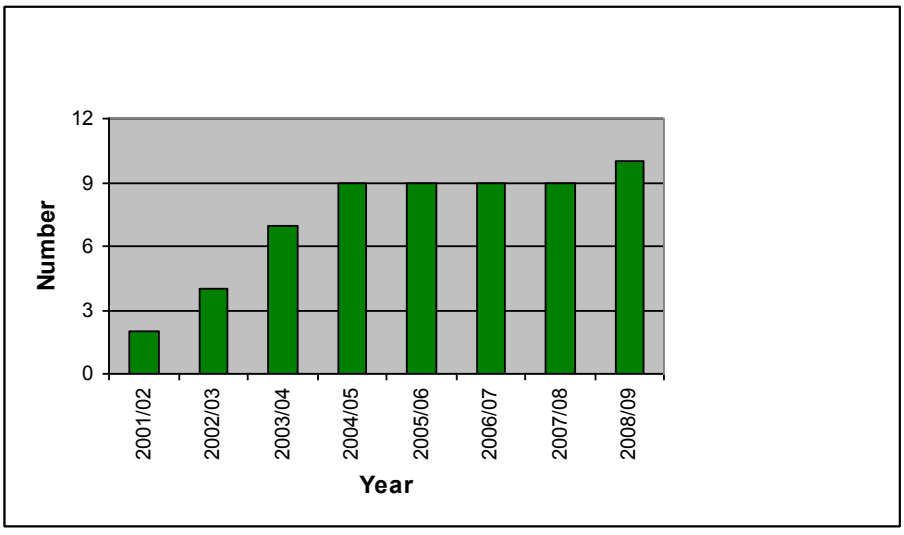

Figure 35: Number Of Weed-led Control Operations In Department of Conservation's Whangarei Area Per Year.

Over the past four years, management of threatened species by the Department of Conservation in the Whangarei Area has resulted in improved security for seven species, and improved understanding of ten species.

For 2008/2009 there was:

- Improved security of 20% (5/25) for 'threatened' animal species, and improved security for 0% 'threatened' plant species.
- Improved understanding of 12% (3/25) for 'threatened' animal species, and 4% (2/45) for 'threatened' plant species.
- Improved security of 2% (2/100) for 'at risk' animal species, and improved security for 0% 'at risk' plant species.
- Improved understanding of 5% (5/100) for 'at risk' animal species, and 0% for 'at risk' plant species.

Improved security was primarily a result of predator control, advocacy, and translocation of individuals to establish new populations in additional locations. Improved understanding was primarily a result of monitoring and research.

Table 13: Outcome Of Management Of Threatened Species By The Department Of Conservation In Whangarei Area.

Year	Improved security for **'acutely threatened'** species	Improved security for **'at risk threatened'** species	Improved security for **'chronically threatened'** species	Improved understanding for **'acutely threatened'** species	Improved understanding for **'at risk threatened'** species	Improved understanding for **'chronically threatened'** species
2005/06	3 NZ fairy tern Brown teal NZ dotterel	0	1 North Island brown kiwi	3 NZ fairy tern Brown teal NZ dotterel	1	1 North Island brown kiwi
2006/07	4 Added *Amborhytida tarangiensis*	2 Turbott's weevil *Placostylus hongii*	1 North Island Brown Kiwi	2 Removed NZ dotterel	5 *Cyclodina mokohinau* *Cyclodina macgregori* Hochstetters frog Turbott's weevil *Placostylus hongii*	1 North Island Brown Kiwi
2007/08	4 NZ fairy tern Brown teal NZ dotterel *Amborhytida tarangiensis*	2 Turbott's weevil *Placostylus hongii*	2 Added Black mudfish	4 Added *Hebe bishopiana* *Pittosporum obcordatum*	5 *Cyclodina mokohinau* *Cyclodina macgregori* Hochstetters frog Turbott's weevil *Placostylus hongii*	2 Added Black mudfish
2008/09	4 NZ fairy tern Brown teal NZ dotterel *Amborhytida tarangiensis*	2 Turbott's weevil *Placostylus hongii*	1 North Island brown kiwi	4 NZ fairy tern Brown teal *Hebe bishopiana* *Pittosporum obcordatum*	4 *Cyclodina mokohinau* Hochstetters frog Turbott's weevil *Placostylus hongii*	2 North Island brown kiwi Black mudfish

5.2 Nga Whenua Rahui Kawenata

Financial assistance has been provided to land owners of Nga Whena Rahui kawenata for fencing and management. This was provided via the Nga Whenua Rahui Fund administered by the Department of Conservation.

5.3 Whangarei District Council

5.3.1 Parks And Reserves

Prior to 2005/2006 plant pest control was carried out by the Parks Department in response to requests for service from the community, or the identification of a specific problem. In 2005/06 a pilot project to control all pest plants within a 12ha area of Mair Park was deemed to be sufficiently successful for the treatment area to be increased by 86% in 2006/07, 60% in 2007/08, and 6% in 2008/09 (see Table 14). Currently 6.3% of reserves managed by the Parks Department receive pest plant control. In the past 12 months Council has contributed to possum and stoat control in Pukenui Forest. The use of Reotahi Reserve has also been granted for a possum fur trapper, and possum control funding to the tune of $2,000 has been provided to the Little Munroe Bay Reserves.

Table 14: Pest Plant Control Undertaken By WDC Parks Department.

Year	Ha Treated	Sites
2005/06	12	Mair Park
2006/07	85	Parihaka, Mair Park, Hatea River
2007/08	136 *	In addition: AH Reed Kauri Park, Whangarei Falls Scenic Reserve, Maunu Cemetery
2008/09	145	In addition: Coronation Reserve

* Plus a control operation for Himalayan fairy grass (100ha) was co-funded by WDC and DoC.

5.3.2 Conservation Covenants

Monitoring of the conservation covenants established under the Reserves Act with Whangarei District Council was initiated in 2005, and has continued since this time. The original intent of monitoring was to determine; if the covenants remained, their condition, if the owners were adhering to the conditions in their covenant agreements (i.e. perimeter fencing, exclusion of stock), whether clearance of indigenous vegetation was occurring, and provide advice to landowners. By the end of 2007/08 24% (183) covenants had been monitored, 157 in 2005, none in 2006, 16 in 2007, and 10 in 2008.

Monitoring typically involves a site visit of one hour duration, although the length of time varies according to the size of the covenant and whether the landowner is present. During the site visit a walk through occurs, and observations are recorded. A report is subsequently prepared and provided to the landowner. The whole process takes a total of five hours per covenant.

Threatened animal species were recorded in 27% (50) of covenants monitored, including; North Island brown kiwi, miromiro (tomtit), banded kokopu, cave weta, fernbird, and kaka. An additional 38 covenants may have contained North Island brown kiwi. Threatened plant species were recorded in 6% (11) of covenants monitored, including; *Carex secta*, kawaka, king fern, *Metrosideros albiflora*, Tawapou, tree fuchsia, and Wharanui. An additional three covenants were listed as containing threatened plant species in PNA reports, and two may have contained *Fuchsia procumbens*.

The three primary methods used to manage covenants were fencing, pest plant control and animal pest control. Approximately 96% (175) of covenants were fenced, although 12 of these were in need of maintenance. Of the remainder 1.6% (3) were partially fenced, and 2.2% (4) were unfenced. The majority of the conservation covenants (94%) did not contain sign of stock. Of the remaining 11 covenants which contained sign of stock, seven of the intrusions were estimated to have occurred within the last six months.

The majority (81%) of covenants contained 1-5 pest plant species. In total 37 pest plant species were recorded. Some form of mechanical or chemical control had been carried out in 26% of the covenants. Just over half of the covenants (56%) contained 1-5 animal pest species. The most commonly recorded species were possums (98), followed by rats (35), feral goats (24), mustelids (23) and feral pigs (22). Some form of animal pest control was carried out in 43% of covenants, but in 23 of these cases, control was described as limited. Landowners targeted possums, rats, and mustelids, and the following methods of control were utilised: trapping (18), poisoning (9), and shooting (5). The effectiveness of plant and animal pest control operations was not determined.

An attempt was made to assess the condition of each conservation covenant (see Appendix G for the assessment criteria). Figure 36 shows the distribution of scores (a minimum of 1 and maximum of 5). None of the covenants scored less than 3.1, and the majority scored over 4. However, the score does not necessarily provide an assessment of ecological health. The presence of pest plants, condition of the vegetation, and compliance with covenant conditions were weighted heavily in the original assessment. In addition, the assessment was based on observations made during a single visit. There was no robust monitoring of the populations of animal pests i.e. residual trap catch (RTC) for possums, tracking rates for rats, and trap catch for feral cats or mustelids, or the indigenous vegetation i.e. photo points, vegetation plots, or Foliar Browse Index (FBI). There was no monitoring of threatened animal species i.e. breeding success of native birds, pitfall trapping for lizards or invertebrates, trapping for freshwater invertebrates or fish.

The utilisation of robust scientific monitoring methods is not practical or cost-effective for a large number of small conservation covenants which are visited periodically. The focus of monitoring should be to record what is observed at a single point in time, and determine the level of management the covenant has received. While the majority of covenants are fenced, free of stock, and intact, they do not receive a minimum standard of care. Minimum standards of care are described in Wildlands Contract Report No. 1844 (2008) and include; maintaining riparian vegetation, eradication/control of invasive plant and animal species which may be impacting on flora and fauna values, with consideration given to restoration planting. In the absence of management covenant condition will be deteriorating over time largely due to browsing and predation by introduced animal pests, and the invasion and spread of pest plants.

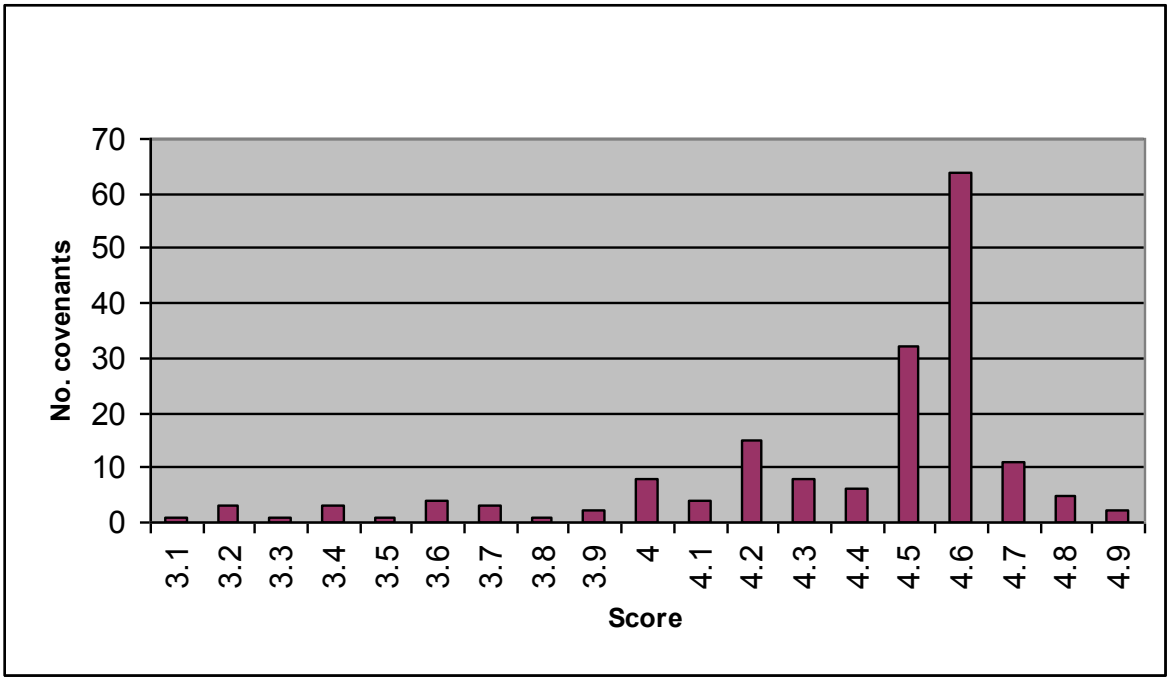

Figure 36: Assessment Score Of Conservation Covenants.

5.3.3 Environmental Enhancement Fund

The Environmental Enhancement Fund of $20,000 per annum was initiated in 2007/08 to provide support for the protection and enhancement of biodiversity on private property within Whangarei District. This initiative was funded by Whangarei District Council. Ten projects were funded in 2007/08, and nine in 2008/09. The projects funded in 2007/08 included; animal pest control, planting of specimen trees, pest plant control, development of a wetland management plan, and fencing. In 2008/09 the fund assisted with monitoring rat and possum numbers, pest plant control, animal pest control, assistance with a community nursery, and fencing of a water way and wetland. Figure 37 shows the distribution of projects funded in the district. The Fund was discontinued in 2009/10.

5.3.4 Environment Advice Fund

During the 2008/09 financial year, Whangarei District Council secured funding from the Biodiversity Advice Fund administered by the Department of Conservation. This was used to fund advice from an independent ecologist to a limited number of landowners in the district with areas of indigenous biodiversity on their land. Applications were invited and 12 landowners benefited from the fund.

Advice was given in the form of an ecological report outlining the state, value and significance of the vegetation. Potential management and funding options to maintain or improve the state of the area in question were also given. Often the vegetation was being considered for protection by covenanting.

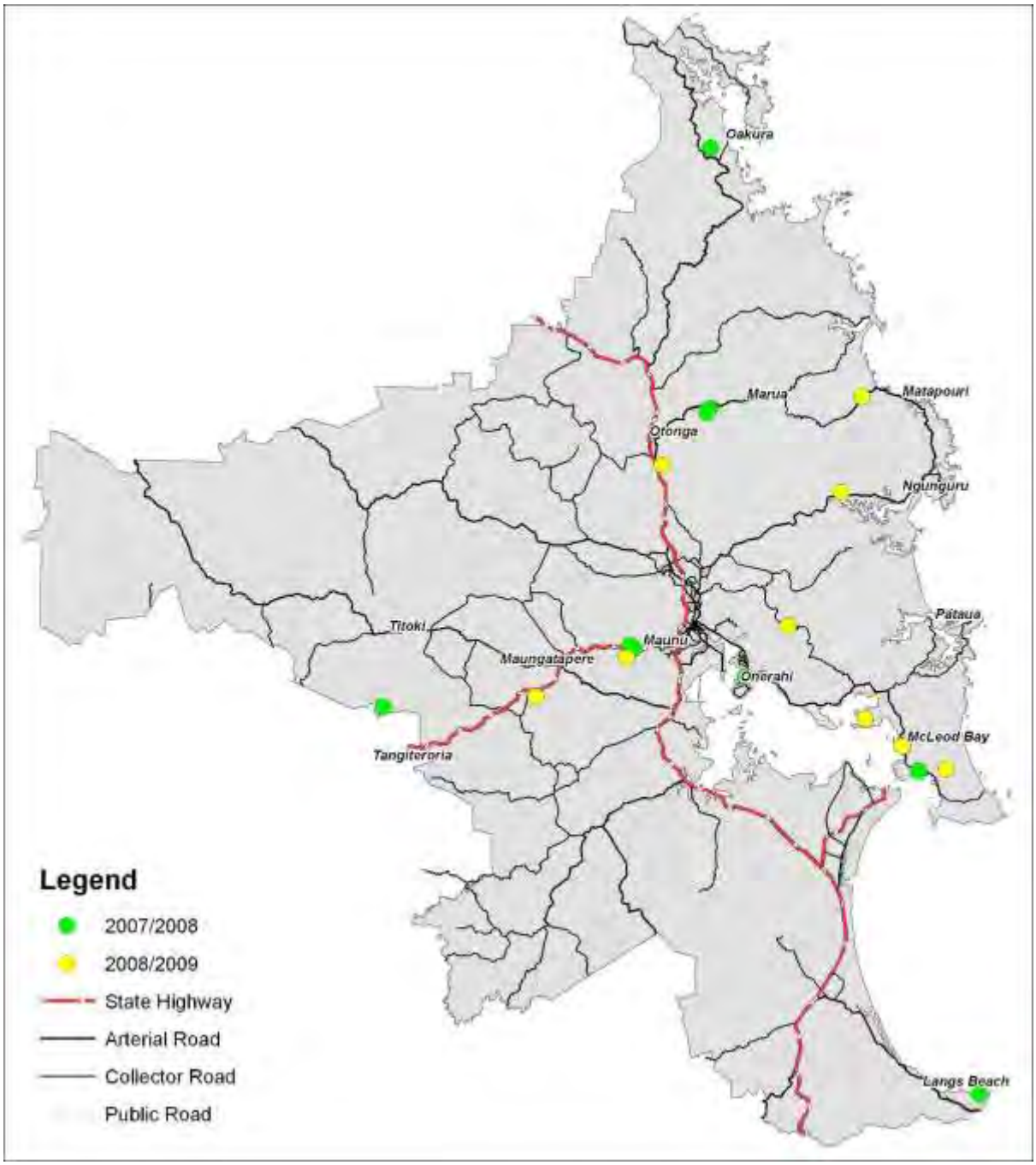

Figure 37: Distribution Of Environmental Enhancement Fund Projects.

5.4 QEII National Trust Open Space Covenants

As at 1 January 2009 there were 263 Open Space Covenants within Whangarei District. Monitoring of these covenants detected the presence of 15 threatened species (see Table 15), and 69 animal and plant pest species. The top 13 pest species (≥ 20 records) are listed in Table 16.

Table 15: Threatened Species Recorded In Open Space Covenants.

Threatened Species	No. Records
Australasian bittern	3
Banded dotterel	1
Black shag	1
Brown teal	1
Grey duck	1
Hebe bollonsii	1
Hochstetter's frog	14
NI brown kiwi	19
NI fernbird	2
NI kaka	4
Senecio scaberulus	1
Spotless crake	1
Utricularia delicatula	1
White heron	2
Total	52

Table 16: Top 13 Pest Species Recorded In Open Space Covenants.

Pest Species	No. Records
Possum	168
Wandering willie	48
Kahili ginger	43
Privet	32
Feral pig	28
Gorse	28
Stoat	28
Climbing asparagus	28
Ship rat	27
Feral cat	24
Pampas	24
Selaginella	21
Ferret	20

Protection and enhancement of biodiversity in Open Space Covenants is primarily carried out through the management of individual pest species, or a combination of species (see Table 17).

Table 17: Management Of Pest Species In Open Space Covenants.

Management of a Pest Species	No. Records	No. Covenants
Containment	26	23
Eradication	47	30
Monitoring	184	101
Progressive control	447	165
Unknown	15	12
Total	719	331*

* The total does not add to 269 as some covenants are managing more than one pest species.

5.5 Northland Regional Council

5.5.1 Environment Fund

The Northland Regional Council Environment Fund was established in 1996 to help individuals and voluntary groups improve and protect Northland's natural environment. Projects must be of long-term benefit to the local environment and show evidence of good resource management on private land. In 2008/09 the contestable Fund was $500,000. The Fund is targeted at several different areas with most projects funded at 50% of their total costs. These targeted areas include; general projects which restore and protect native habitats such as streamsides, remnant forest, shrubland and coastal margins, wetland protection and enhancement, pest animal and plant control, re-vegetation and enhancement with native plants, coastal dune enhancement and protection, and stock exclusion from coastal marine (tidal) areas.

Figure 38: Distribution Of NRC Environment Fund Projects Within Whangarei District. Source: Northland Regional Council.

5.5.2 Community Pest Control Areas

There are currently four Community Pest Control Areas (CPCAs) within Whangarei District. Possum, rat, mustelid and feral cat control occur in three of the CPCAs. Management at Whananaki consists solely of Argentine ant control. Pest plants are targeted in 50% of the areas.

Table 18: Management At Community Pest Control Areas Within Whangarei District.

Location	Possums	Rats	Feral cats	Mustelids	Argentine Ants	Pest plants
Manganese Point	√ Poisoning 10% PAI initial control 15% maintenance	√ Poisoning 15% initial control 20% maintenance	X #	√ DOC 250 traps Maximum trap catch	X	Ginger and moth plant Control of infected area
Pataua North	√ Poisoning 10% PAI initial control 15% maintenance	√ Poisoning 15% initial control 20% maintenance	X #	√ DOC 200 traps Maximum trap catch	X	Pampas and moth plant No plant >300mm
Tutukaka	√ Poisoning 10% PAI initial control 15% maintenance	√ Poisoning 15% initial control 20% maintenance	X #	√ DOC 250 traps Maximum trap catch	X	X
Whananaki	X	X	X	X	√ 90-95% reduction Bait in vials – Landcare procedure	X

*PAI Possum Activity Index
Live capture traps are loaned to landowners to set and check as they see fit.

5.6 Fish and Game New Zealand Wetlands

Fish and Game New Zealand manages two wetlands within Whangarei District for game bird hunting and to protect biodiversity values. At the Bissett Wetland there is intensive management of pest plants, and fencing to control stock and protect new plantings. At Borrow Cut Wetland there is spraying and mulching of pest plants, the maintenance of structures to exclude stock, and the protection of open water areas.

5.7 NZ Native Forest Restoration Trust Reserve

As part of the bequest of the William Upton Hewett Reserve the Hewett family established a fund to pay for ongoing management of the Reserve. Management includes control of pest plants including; wandering willie, hakea, wilding pines and pampas, and control of animal pests including feral pigs, goats, possums, cats, mustelids, rodents and rabbits.

5.8 Managed Areas Without Formal Protection

5.8.1 Landcare Groups

There are 25 Landcare Groups within Whangarei District. Currently there is no data available on their area of interest, therefore the dots represent a centre point for each group (see Figure 39). Plotting a 500m radius from each dot indicates 12 Landcare Groups intersect with a Protected Natural Area (PNA), and 18 intersect with a high priority Threatened Environment (Acutely Threatened = 6, Chronically Threatened = 12). The management of the Landcare Groups includes; pest control, re-vegetation, improving stream health, and kiwi recovery. Eight of the Landcare Groups work collaboratively under the banner of the Whangarei Heads Landcare Forum to protect an area of 6,000ha at Whangarei Heads where considerable effort has been put into predator control to protect the kiwi population. The Forum complements the Department of Conservation's Northland Kiwi Sanctuary which includes the Bream Head area.

5.8.2 Coastcare Groups

The Coastcare programme is co-ordinated by the Northland Regional Council, with a dedicated full-time co-ordinator. Coastcare involves communities taking action to address environmental issues and concerns with their local beaches.

There are eight Coastcare Groups within Whangarei District (see Figure 39). They are located from Whangaruru in the north to Waipu Cove in the south. The groups are focused primarily on re-vegetation of the foreshore and dune systems to provide stability, and improve the health of these ecosystems. Some of the groups have also undertaken animal or plant pest control, fencing, signage, public education and beach clean-ups. From time to time there are regional Coastcare workshops to educate individuals and communities on the importance of our coast and methods of protection/restoration.

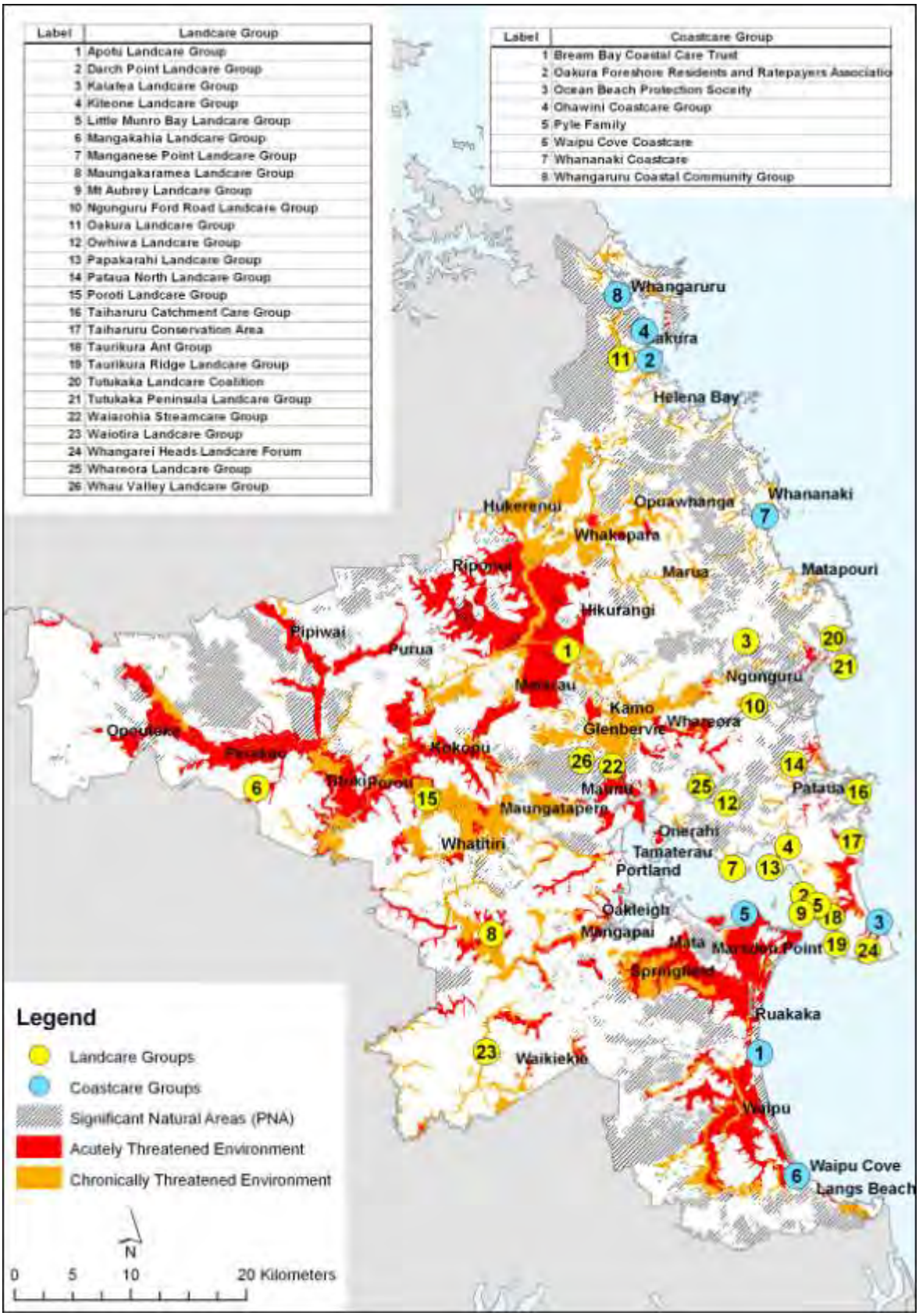

Figure 39: Landcare And Coastcare Groups Within Whangarei District.

Table 19: Location And Activity Of The Coastcare Groups Within Whangarei District.

Location	Group	Activity
Oakura	Oakura Foreshore Residents and Ratepayers Association	Planting along the Oakura foreshore i.e. with spinifex
Ohawini		Issues with vehicles on the beach. Planting at the end of Ohawini Bay i.e. spinifex.
Ocean Beach	Ocean Beach Protection Society	Restore and protect biodiversity in the area. Weed and pest control. Back dune planting i.e. manuka, kanuka, cabbage trees, flax, coprosmas and pohutukawa, and revegetation of the sand dunes with native sand-binding plants i.e. pingao and spinifex.
One Tree point	Pyle family	Planting of spinifex and pingao for erosion control.
Ruakaka	Bream Bay Coastal Care Trust	Protect and enhance indigenous flora and fauna and ecosystems. Restoration of the dune lake at Ruakaka. Pest control in the area adjacent to Ruakaka Wildlife Refuge. Collection of seed i.e. spinifex for propagation and planting.
Waipu Cove	Waipu Cove CoastCare	Planting of spinifex and pingao for erosion control.
Whananaki	Whananaki CoastCare	Pest control. Planting for erosion control.
Whangaruru	Whangaruru Coastal Community Group	Focus on a range of issues in Whangaruru harbour and catchment. Planting of the foreshore.

5.8.3 Weedbusters

Weedbusters (www.weedbusters.co.nz) is a weeds awareness and education campaign that aims to protect New Zealand's environment from the increasing weed problem. The goals of Weedbusters are to:

1. Ensure that the New Zealand population is aware of the threat of weeds.
2. Increase the number of people participating in managing the weed problem.
3. Help all agencies involved in weeds work to share resources and provide clear and consistent messages.
4. Secure ongoing funding for the Weedbusters programme.

There are four registered Weedbusters groups located within Whangarei District. They are; Bream Bay Coastal Care Trust, Darch Point Landcare, Mike Ferris and Raewyn Honeybone. Their work is focused on weed control, and replanting.

5.8.4 Whitebait Connection

The Whitebait Connection (www.whitebaitconnection.co.nz) is an action based environmental education programme offering ways in which New Zealanders can come to understand and become involved in the future health of our local streams and rivers. The Whitebait Connection (WBC) was founded in Northland in 2002 under the auspices of the Mountains to Sea Conservation Trust, and is active in all three districts. Whitebait Connection Co-ordinators visit schools to plan and integrate the WBC programme into the curriculum and deliver in-stream workshops for children, teachers and parents. The Co-ordinators support schools to take action for their local freshwater environments. Within Whangarei District there are 15 sites receiving monitoring and/or restoration by 13 schools (see Figure 40). They are supported by He Kakano Community Nursery.

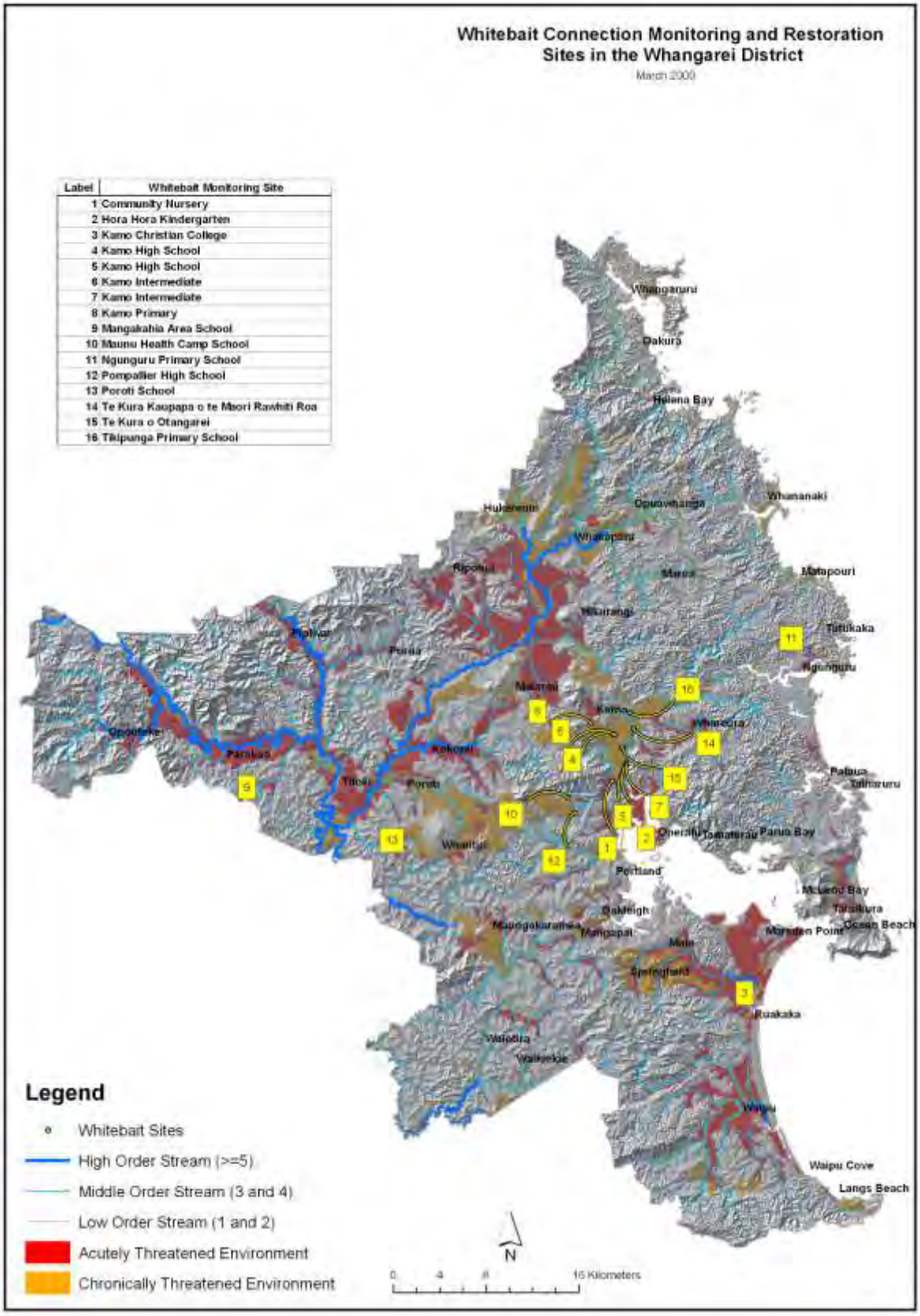

Figure 40: Whitebait Connection Sites Within Whangarei District.

6. Development Pressure - Subdivision and Land Use

Subdivision and land use are subject to further focus, as district councils have specific functions under the Resource Management Act (s31) to control their effects, particularly for the maintenance of biological diversity. The state of subdivision and land use in relation to indicators of indigenous biodiversity and natural environments in the district is outlined in this section.

6.1 Subdivision

From 1996 to January 2009 11,785 lots were created within Whangarei District as a result of subdivision*. Their spatial distribution is shown in Figure 41. The main statistics relating to effects on biodiversity are (Table 20):

- Sixty two percent of the lots (7,257) were located within either an Acutely (4,083 or 34.6%) or Chronically (3,174, or 26.9%) Threatened Environment (Figure 42).
- Sixteen percent of the lots (1,851) were located within a significant natural area identified as part of the Protected Natural Areas Programme (Figure 43).
- Seven percent (843) of the lots intersected with both a significant natural area identified as part of the Protected Natural Areas Programme and a Threatened Environment (i.e. vestiges of remaining significant indigenous habitat).
- Thirty four percent of the lots (4,035) intersected with an area with indigenous land cover as described in the Land Cover Database 2 (Figure 44).
- Twenty six percent of the lots (3,024) intersected with an area where North Island brown kiwi are reported to be present (Figure 45).
- Of these, 413 (3.5%) were in areas reported to contain high concentrations of North Island brown kiwi (Figure 45).
- Thirty nine percent of the lots (4,606) were created in the Countryside Environment (Figure 46)
- Six percent of the lots (712) were created in the Coastal Countryside Environment (Figure 46).

Table 20: Intersection Of New Lots Created As A Result Of Subdivision From 1996-2009 With Key Environmental Variables.

Variable	Sub-class	Number of lots	%
		11,785	
Threatened Environments		7,257	61.6
	Acutely	4,083	34.6
	Chronically	3,174	26.9
Protected Natural Areas		1,851	15.7
Threatened Environments and Protected Natural Areas		843	7.2
Indigenous Land Cover (LCDB2)		4,035	34.2
NI Brown Kiwi Habitat	Presence	3,024	25.6
Of These (NI Brown Kiwi Habitat)	High Concentration	413	3.5
Countryside		4,606	39.1
Coastal Countryside		712	6.0

*This includes proposed, those at the 223 stage, and those which have been completed.

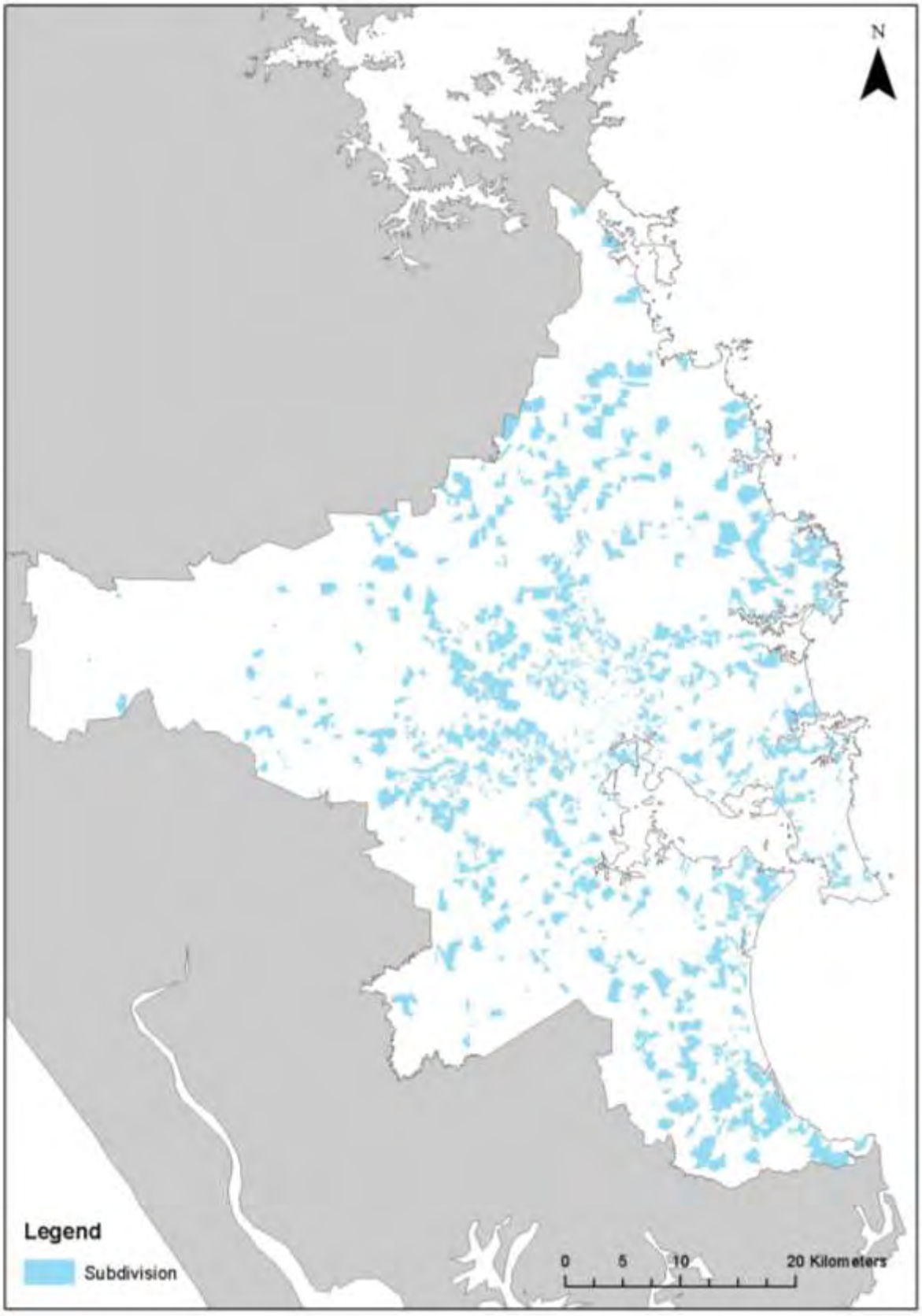

Figure 41: New Lots Created From 1996 - Jan 2009 Within Whangarei District.

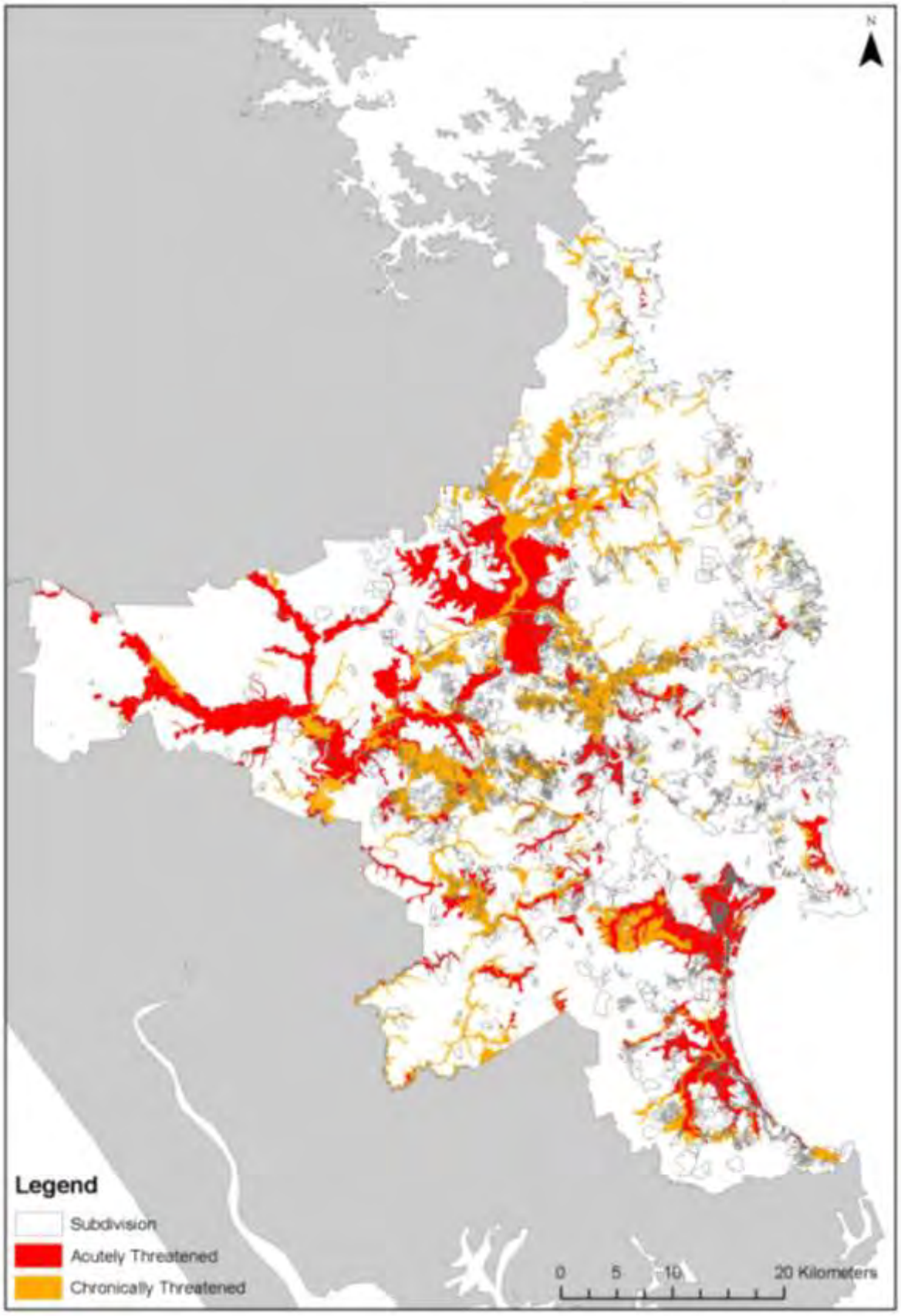

Figure 42: New Lots Created From 1996 - Jan 2009 And Acutely And Chronically Threatened Environments.

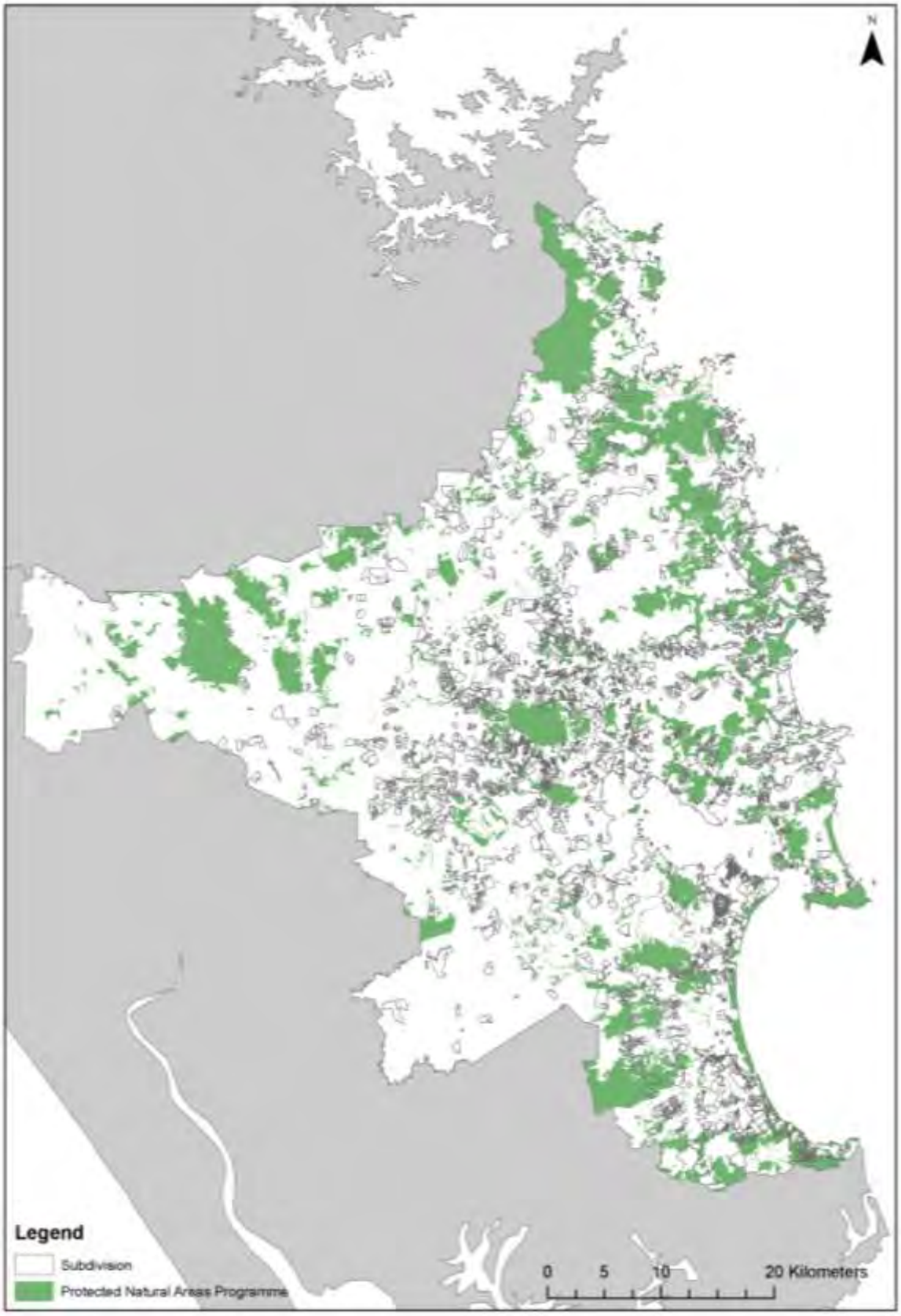

Figure 43: New Lots Created From 1996 - Jan 2009 And Protected Natural Areas.*

* At the time of data acquisition, a Protected Natural Area report had not been completed for the Tokatoka Ecological District.

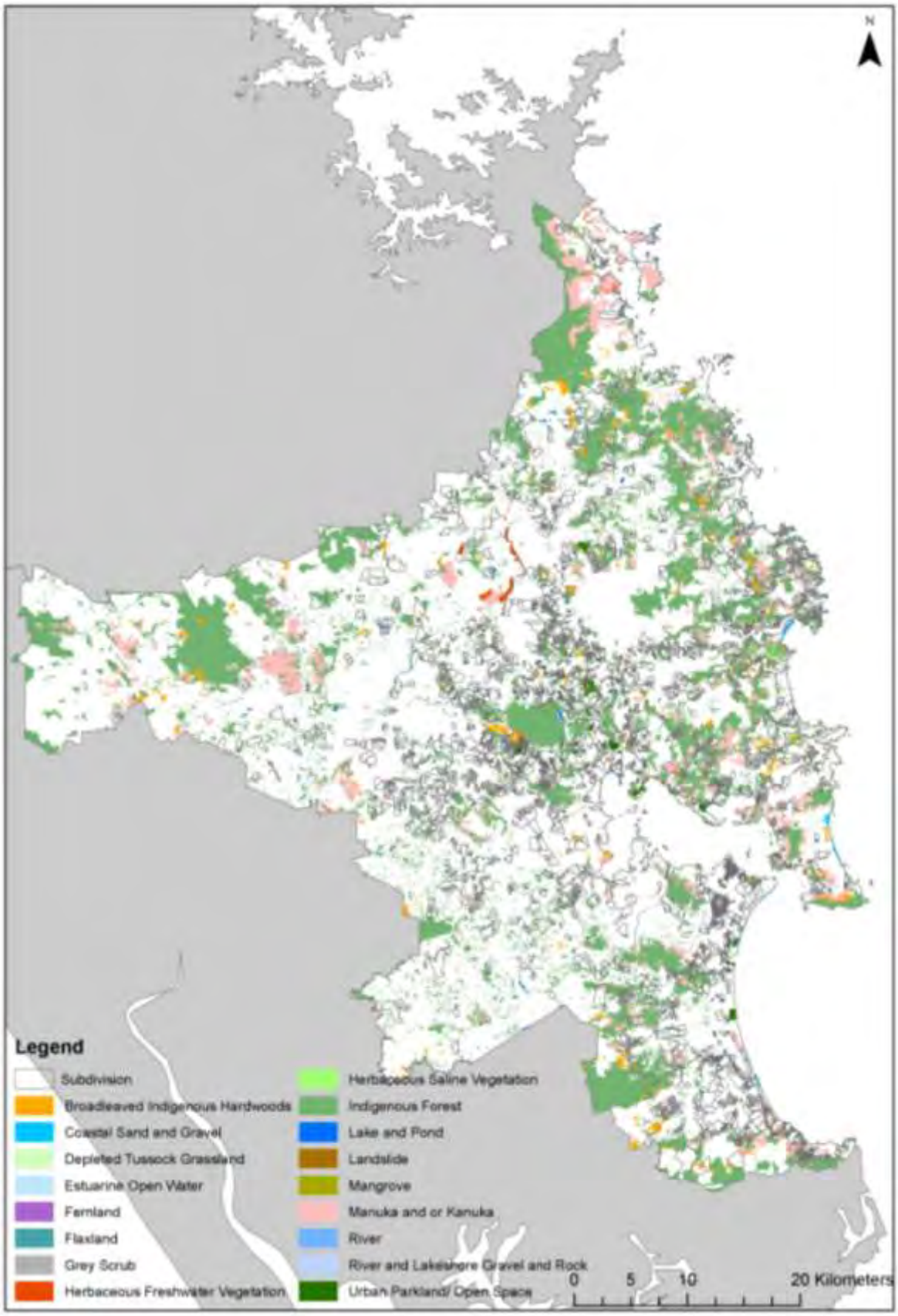

Figure 44: New Lots Created From 1996 - Jan 2009 And Indigenous Land Cover (LCDB2).

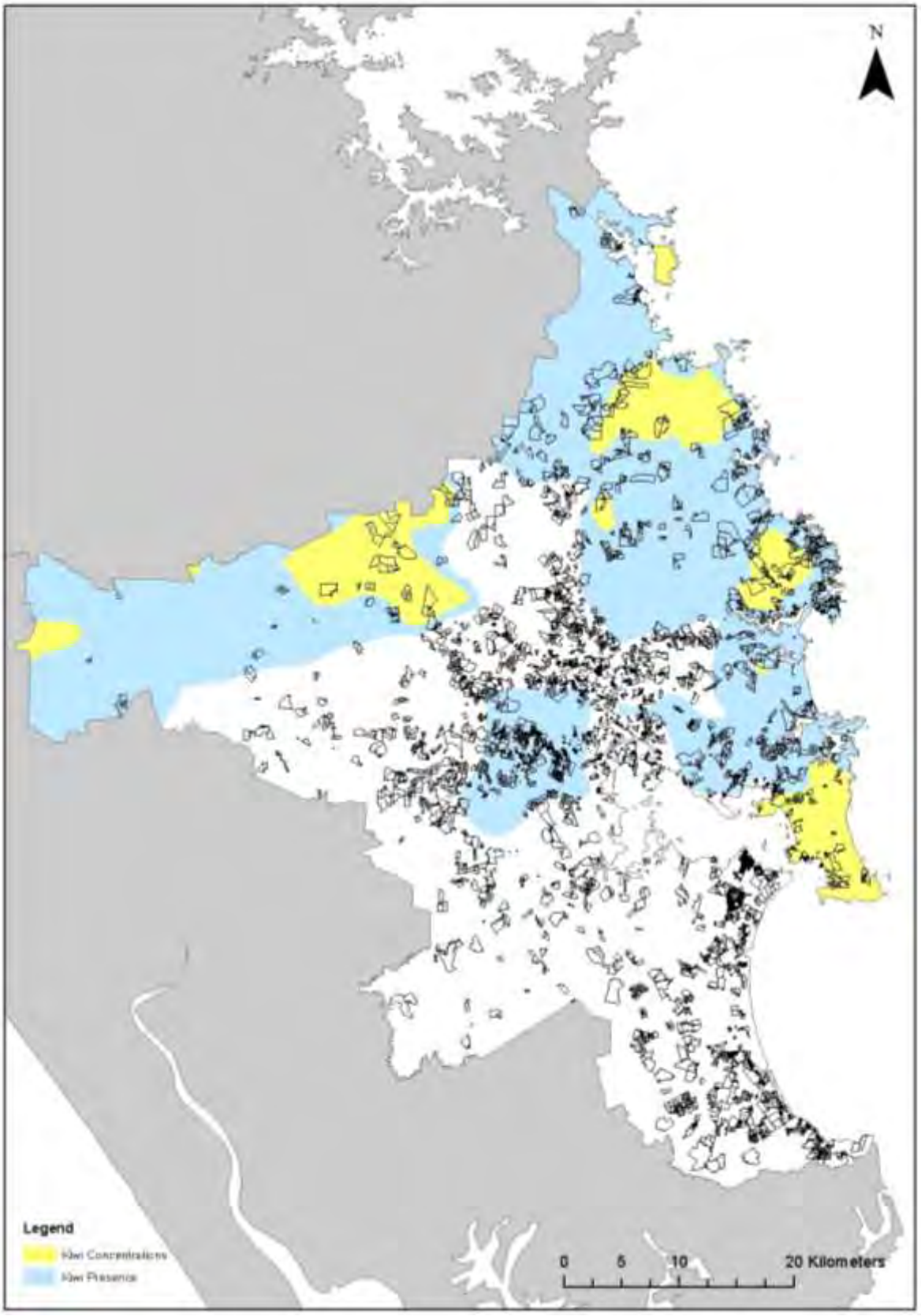

Figure 45: New Lots Created From 1996 - Jan 2009 And North Island Brown Kiwi Areas.

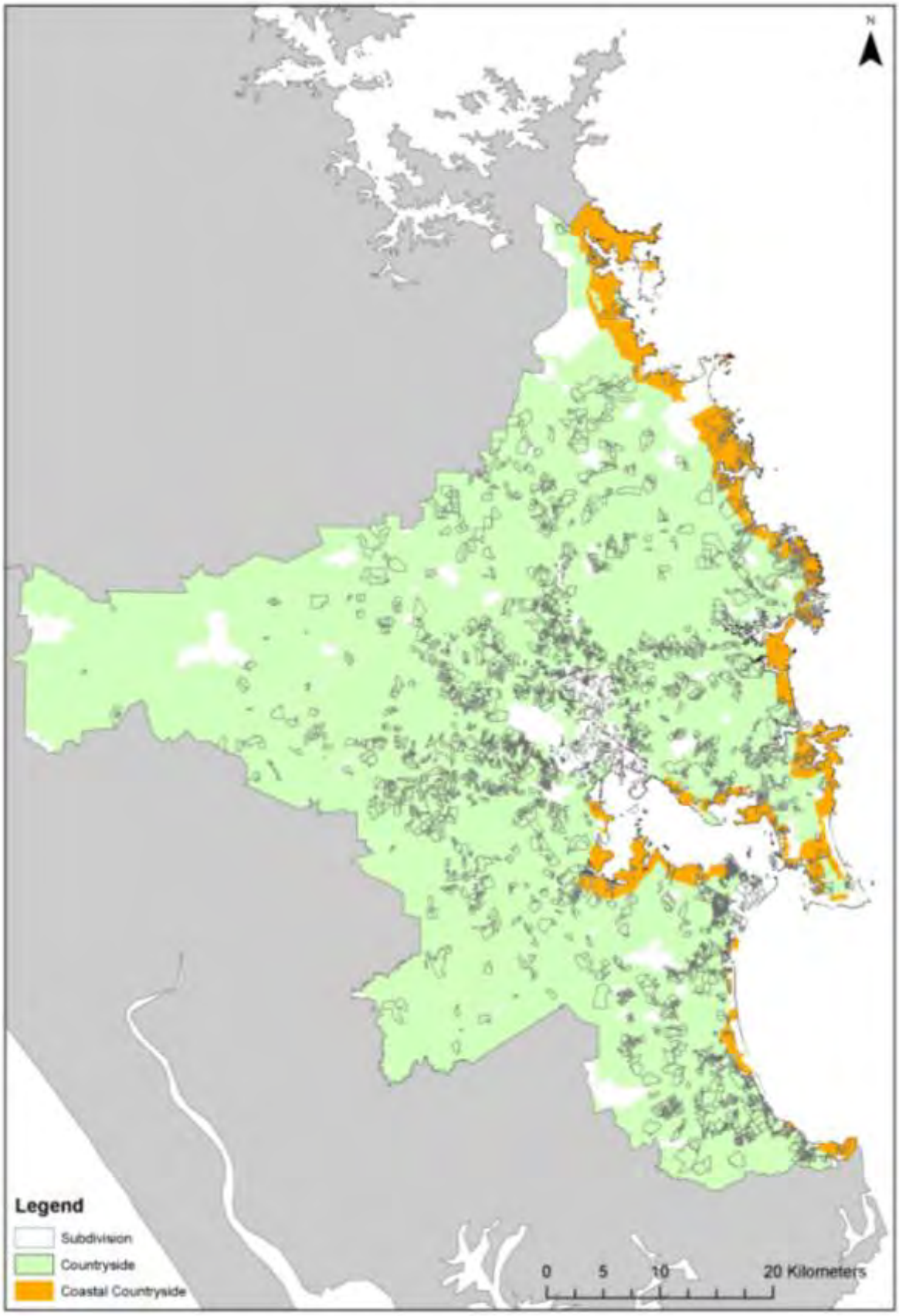

Figure 46: New Lots Created From 1996 - Jan 2009 And Coastal Countryside/Countryside Living Environments.

6.2 Land Use

From 1995 to January 2009, 2,849 land use consents were granted within Whangarei District. Their distribution is shown in Figure 47. The main statistics relating to effects on biodiversity are:

- Fifty two percent (1,469) of the land use consents intersected with either an Acutely (638, 22.4%) or Chronically (882, 31%) Threatened Environment (Figure 48).
- Twelve percent of the lots (338) intersected with a significant natural area identified as part of the Protected Natural Areas Programme (Figure 49).
- Approximately 7% (190) intersected with both a significant natural area identified as part of the Protected Natural Areas Programme and a Threatened Environment.
- Twenty eight percent (787) intersected with an area with indigenous land cover as described in Land Cover Database 2 (Figure 50).
- Twenty five percent (699) of the land use consents intersected with an area where North Island brown kiwi are reported to be present (Figure 51).
- Of these, 134 (4.7%) were areas reported to contain high concentrations of North Island brown kiwi (Figure 51).
- The Countryside Environment contains approximately 16% (441) of the land use consents granted (Figure 52).
- The Coastal Countryside Environment contains approximately 7% (189) of the land use consents granted (Figure 52).

Table 21: Intersection Of Land Use Consents Granted Within Whangarei District 1995-2009 With Key Environmental Variables.

Variable	Sub-class	Number of Land Use Consents Granted	%
		2,849	
Threatened Environments		1,469	51.6
	Acutely	638	22.4
	Chronically	882	30.9
Protected Natural Areas		338	11.9
Threatened Environments and Protected Natural Areas		190	6.7
Indigenous Land Cover (LCDB2)		787	27.6
NI Brown Kiwi Habitat	Presence	699	24.5
Of These (NI Brown Kiwi Habitat)	High Concentration	134	4.7
Countryside		441	15.5
Coastal Countryside		189	6.6

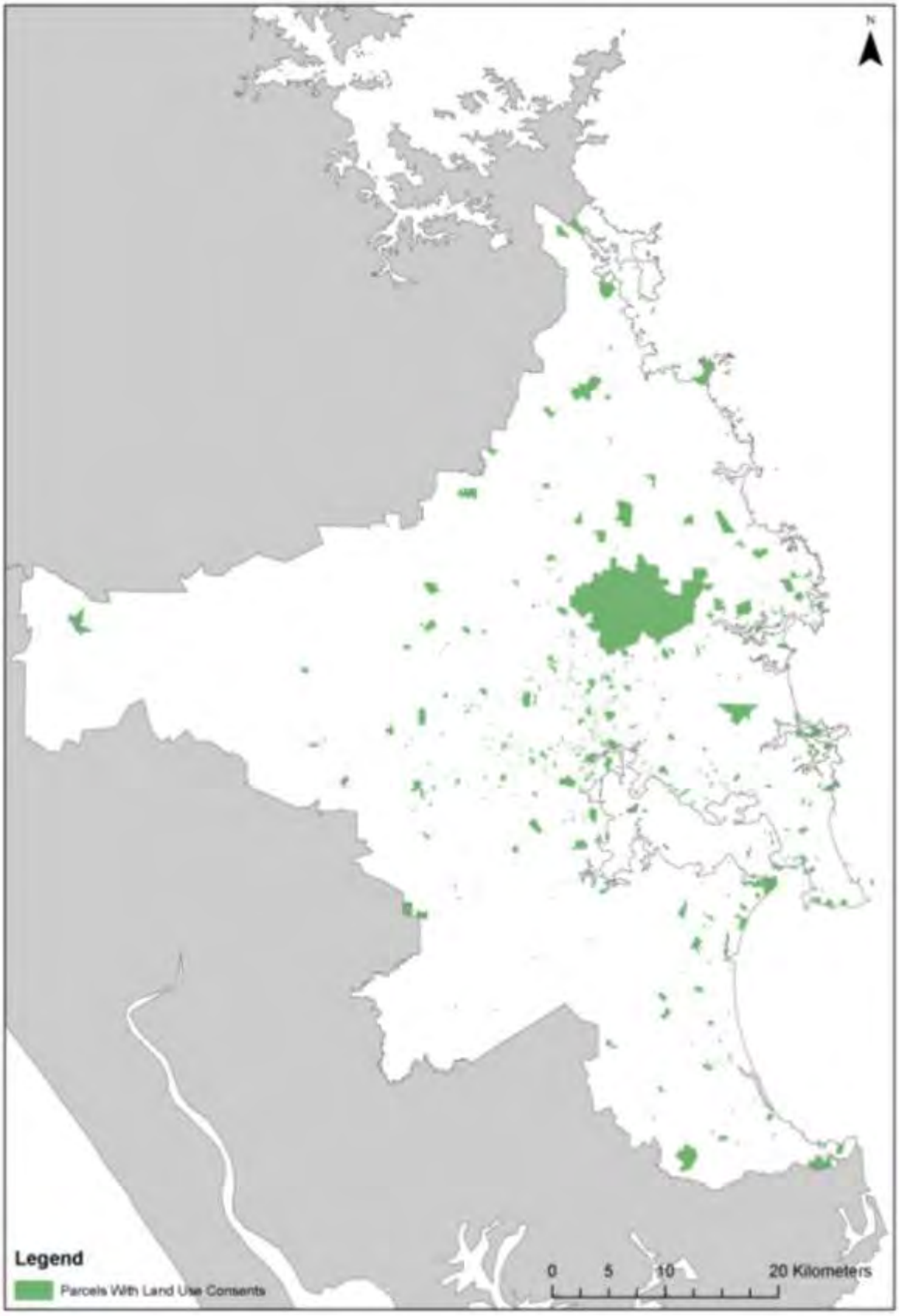

Figure 47: Land Use Consents Granted From 1995 – Jan 2009.

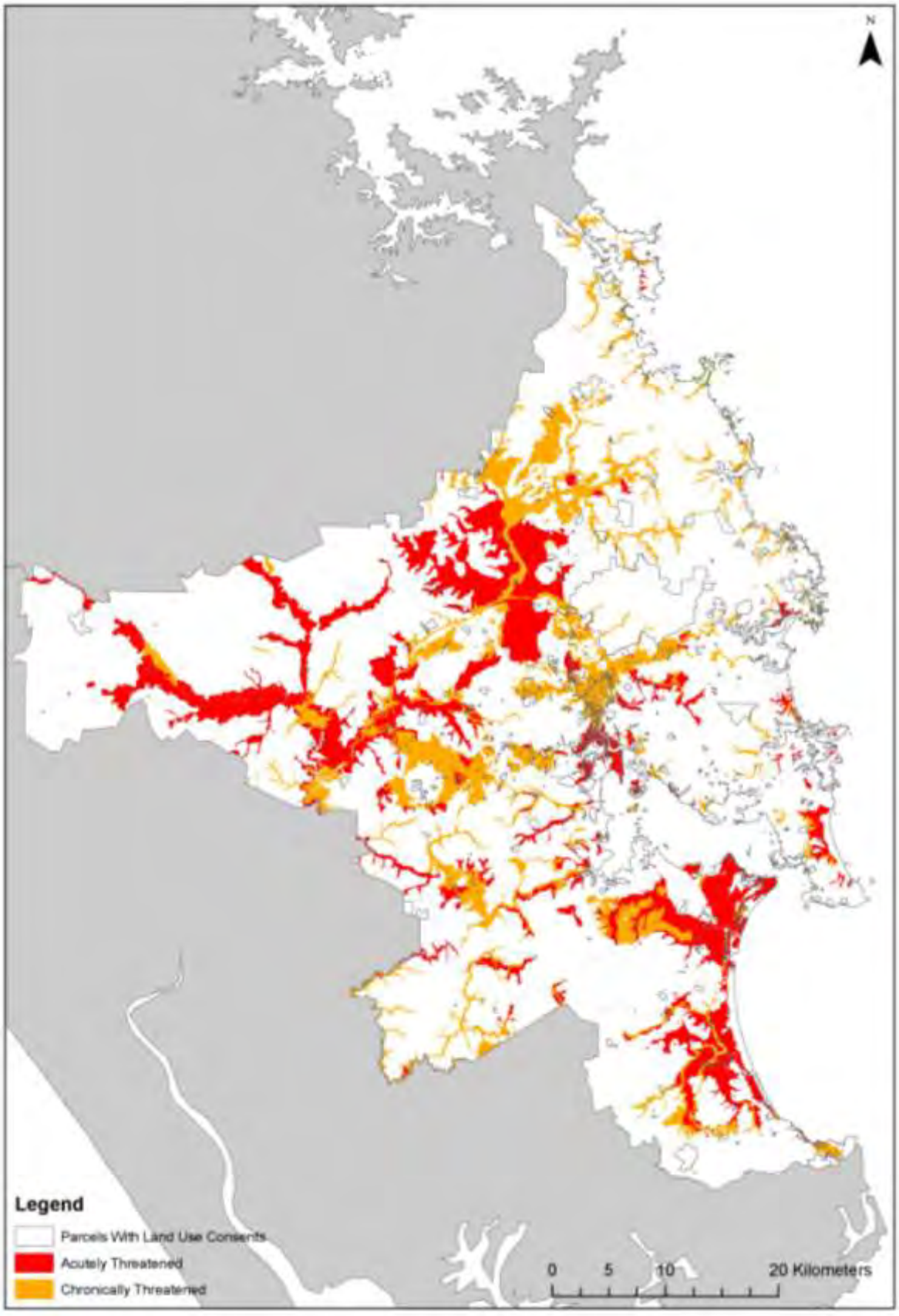

Figure 48: Land Use Consents From 1995 – 2009 In Acutely And Chronically Threatened Environments.

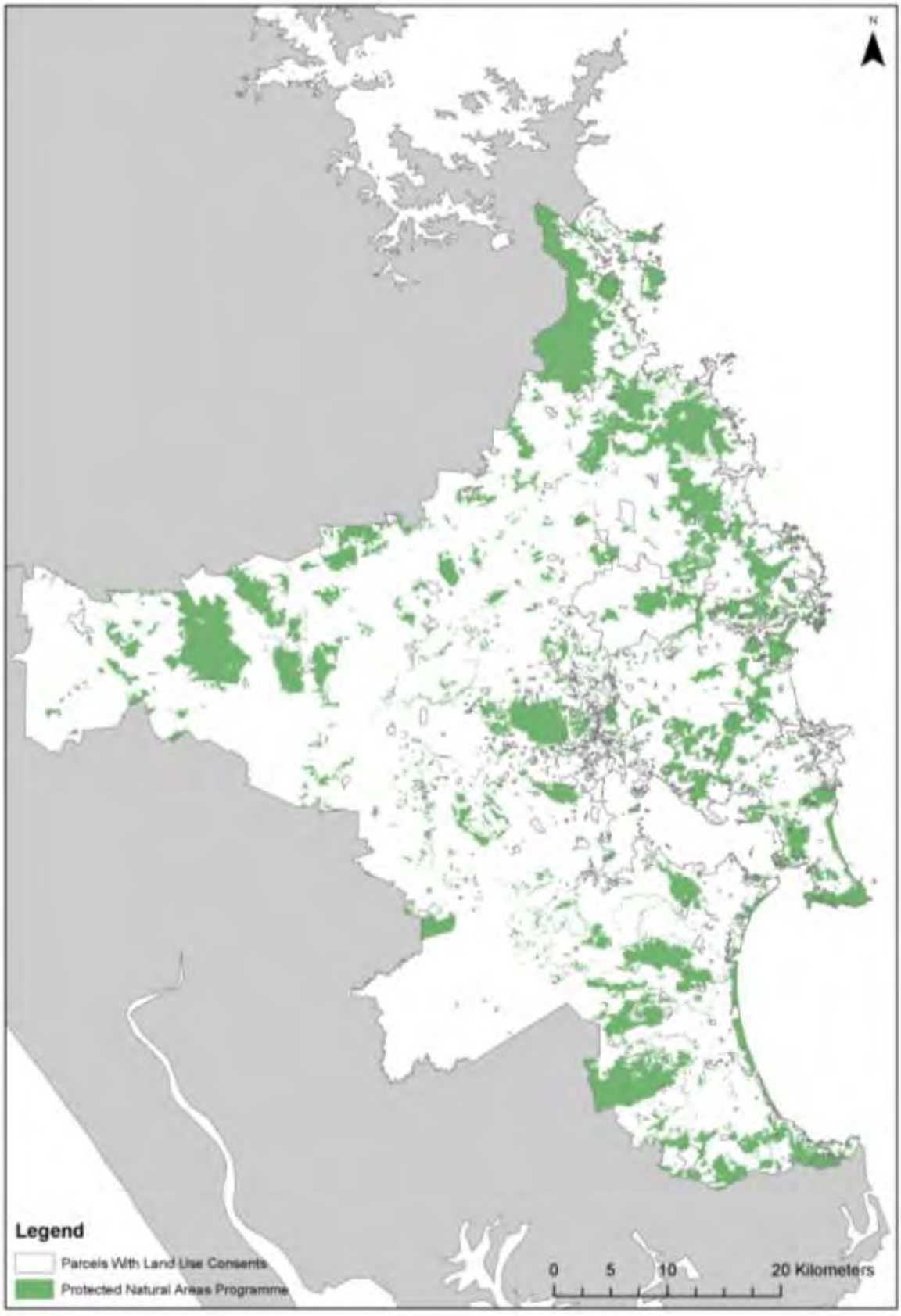

Figure 49: Number Of Land Use Consents From 1995-2009 In Protected Natural Areas.

* At the time of data acquisition, a Protected Natural Area report had not been completed for the Tokatoka Ecological District.

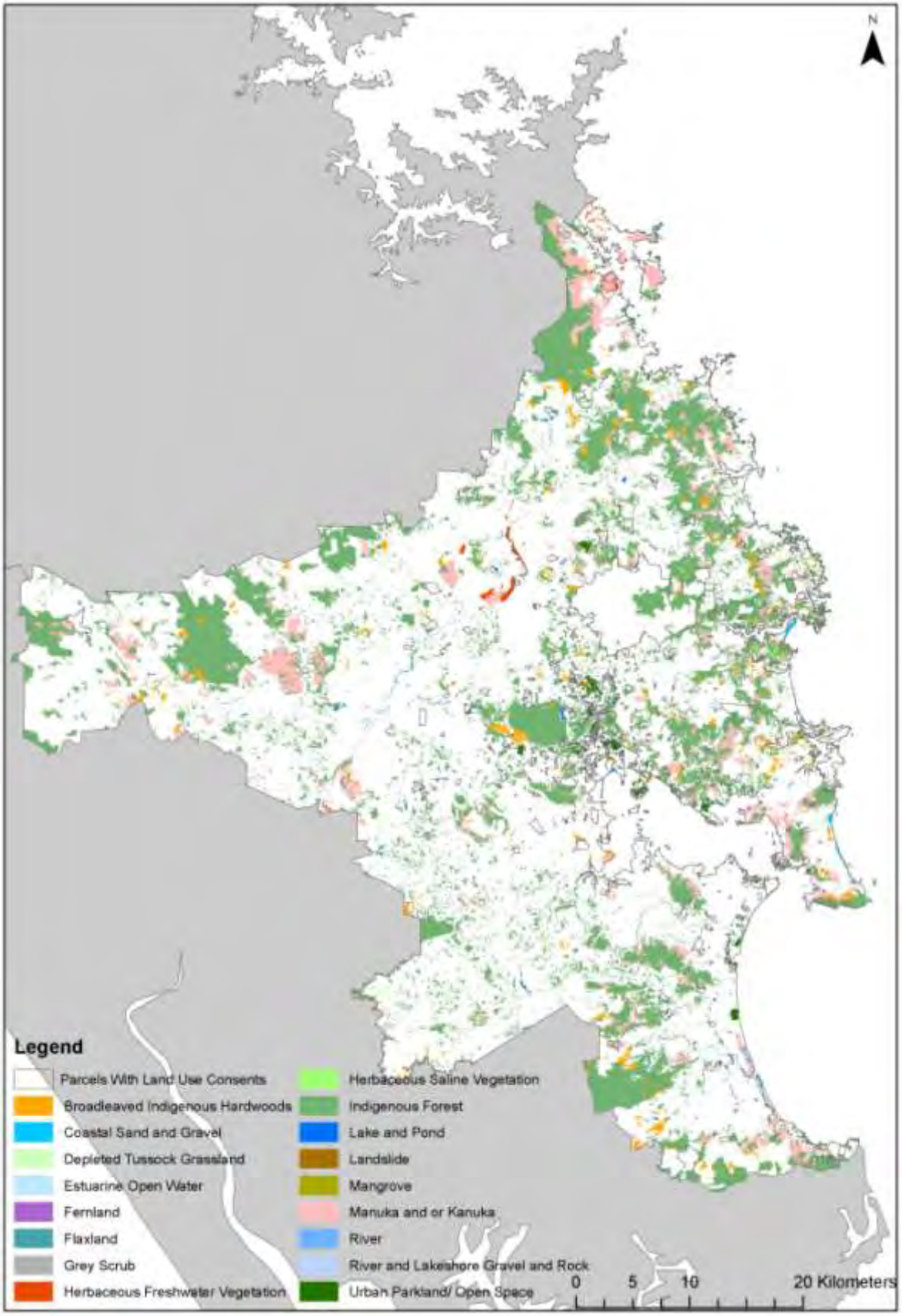

Figure 50: Number Of Land Use Consents Granted 1995 – Jan 2009 In Indigenous Land Cover Classes.

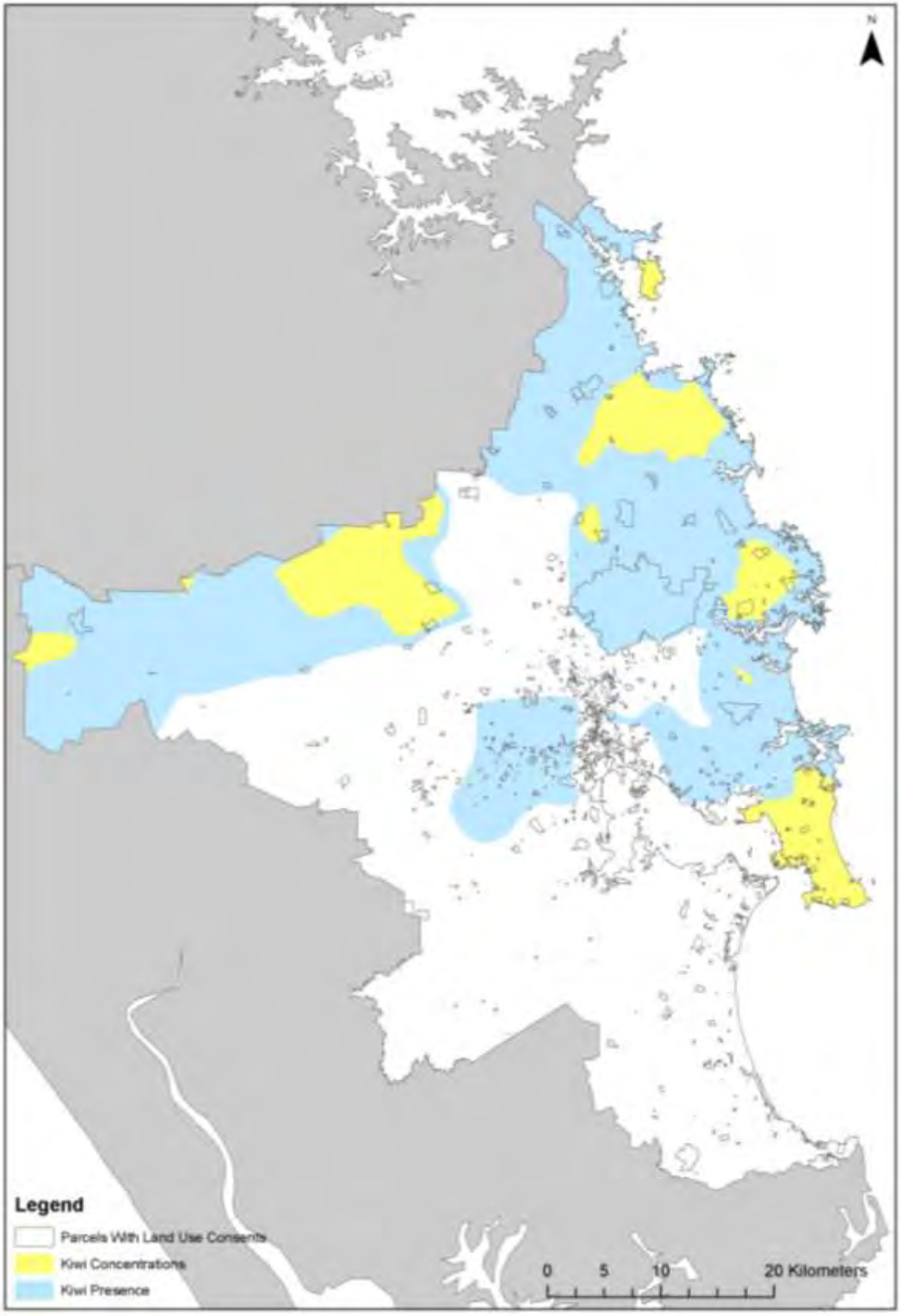

Figure 51: Number Of Land Use Consents Granted 1995 – Jan 2009 In North Island Brown Kiwi Areas.

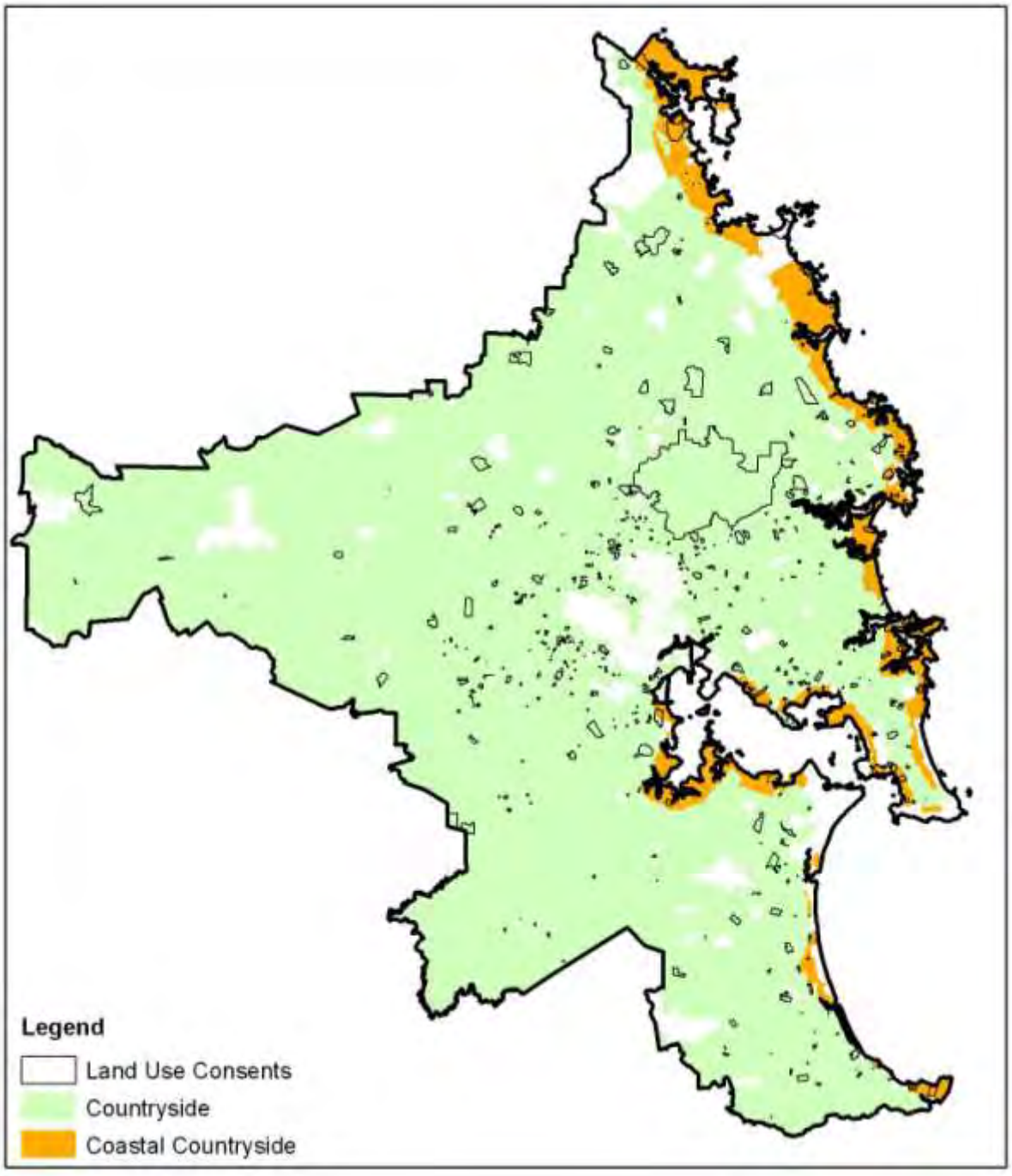

Figure 52: Number Of Land Use Consents From 1995-2009 In The Coastal Countryside And Countryside Living Environments.

From 1996 to January 2009 11,785 lots were created within Whangarei District as a result of subdivision*. Over roughly the same time period (1995 – Jan 2009), 2,849 land use consents were granted. The pattern of new lots and land use consents is shown in Figures 41 and 47, and indicates widespread development with few checks and controls with regards to biodiversity values of the district. The main effects of subdivision and development on biodiversity are outlined in Chapter 2.3.9, and include habitat loss - including fragmentation, and introduction of plant and animal pests in close proximity to remaining indigenous habitats.

*this includes proposed, those at the 223 stage, and those which have been completed.

Subdivision and land use occur at quite a high rate (62% and 52% respectively) in Acutely and Chronically Threatened Environments (those with less than 20% indigenous cover remaining). This is not entirely unexpected, as these areas have a long history of development, or productive land use and may already be seen as compromised. The remaining indigenous habitat in these areas may be highly important from an ecological perspective, as they can provide connections between larger important habitats, through which wildlife can move. Further information which is important in understanding the value of these areas is the amount of indigenous vegetation remaining that has significant ecological values. These areas are represented by the intersection of threatened environments and protected natural areas, and are important, as they may contain some of the only remaining examples of a species in the district. If these fragments are lost, their contribution to biodiversity in the district will also be lost. Approximately 7% of both subdivision and land use (843 lots and 190 land use consents) occurred in these areas.

Protected Natural Areas (PNAs) are natural areas of ecological significance identified through the Protected Natural Areas Programme. These areas have been identified as worthy of protection as they contain representative examples of indigenous biodiversity not well represented in existing protected natural areas. During 1996- Jan 2009, 1,851 lots (16%) were created in these areas; during 1995 – Jan 2009, 338 land use consents (12%) were granted in these areas. In addition, 34% of lots (4,035) were created and 28% of land use consents were undertaken in indigenous land cover classes identified in LCDB2. Roughly a quarter of lots created and land use consents granted were in areas where North Island brown kiwi are present (including in high concentrations). The cumulative effects of development in PNAs and areas of indigenous biodiversity contribute to the transition of a predominantly natural environment into one that is dominated by people. Even if vegetation clearance is minimal, the introduction of possible plant pests in gardens and pets threatens surrounding indigenous biodiversity.

The Coastal Countryside Environment contains 6% (712) of the new lots created, and covers 5.9% (15,890ha) of the district. The Countryside Environment contains 39% (4,606) of the new lots created, and covers 85.1% (230,733ha) of the district. In comparison, 38.6% of the new lots created (4,549) have been in the Living Environments (1, 2 and 3). It is worth noting that Living Environments also occur in coastal townships, and a proportion of the coast is not zoned coastal countryside, leading to an underrepresentation of development in coastal locations with this indicator. The Countryside Environment was defined primarily for agricultural and horticultural production and it contains the most versatile soils of the District. Reduced infrastructure and services are provided in both Countryside and Coastal Countryside Environments, and both contain a high level of indigenous biodiversity. Neither of these Environments are considered to be suited to concentrated residential living. Roughly the same numbers of lots were created in the Countryside Environment and Urban Living Environments. The creation of new lots would be expected to be much higher in the Living Environments, likely in the vicinity of 80%. A more proactive approach which identifies growth areas and restricts development in undesirable areas is preferable in future. Some potential solutions around balancing biodiversity values with development are given in Chapter 7.

7. Response To Pressures

Local government has the primary responsibility for protecting native biodiversity on private land under Sections 30 and 31 of the Resource Management Act. Councils have to be proactive to protect biodiversity values and respond to pressures within their area. National legislation, such as national policy statements and national environmental standards also direct local government's actions in relation to biodiversity. Potential solutions in response to the threats identified in Chapter 2 (Biodiversity), and further in Chapter 6 (Development Pressure – Subdivision and Land Use), have been listed below and include regulatory responses, other plans and strategies, protection and enhancement, information, monitoring and research, education advocacy and collaboration, and economic instruments. The role of Council will vary according to legislation, and include leader, partner, or interested party.

7.1 Regulatory Response

7.1.1 Proposed National Policy Statement On Indigenous Biodiversity (2011).

The proposed National Policy Statement on Indigenous Biodiversity will likely require regional and local authorities to identify locations of significant indigenous vegetation and significant habitats of indigenous fauna, using maps and/or schedules in district and regional plans. It is also proposed to require councils, when considering the effects of any matter (e.g. consent and plan change applications), to regard certain areas as significant indigenous vegetation, or significant habitat of indigenous flora, and therefore a matter of national importance under section 6(c) of the Resource Management Act. As a minimum, these areas are to include naturally uncommon ecosystem types, indigenous vegetation or habitats associated with sand dunes and wetlands, land environments with 20% or less remaining in indigenous land cover, and the habitats of threatened and at risk species. The policy statement also includes the concept of 'no net loss' to biodiversity, where adverse effects cannot be avoided, remedied or mitigated. This aims to allow a more sustainable management approach in protecting biodiversity, by also providing for social and economic well-being. The policy statement also provides direction to involve tangata whenua as kaitiaki when developing and implementing regional policy statements, regional and district plans and identifying significant vegetation and habitats. The national policy statement will go some way to protecting biodiversity on private land when pressures including land use change and development are proposed.

7.1.2 Proposed National Policy Statement for Freshwater Management (2008).

The purpose of the proposed National Policy Statement for Freshwater Management is to guide decision-making on freshwater management under the Resource Management Act; it aims to improve the quality of freshwater in New Zealand. Fresh water resources contain important biodiversity, and are under severe threat from over-allocation, and contamination from discharges. The policy statement directs regional policy statements to identify outstanding and notable values of freshwater resources and provide for protection in regional plans, implement fresh water quality standards and environmental flows and levels, and guide regional and district plans to: restrict existing takes to preserve notable values, effectively manage land use development and contaminant discharge and

manage demands for freshwater. This response will be implemented at the regional and district level, and help to ensure freshwater is managed including for the purposes of biodiversity protection.

7.1.3 New Zealand Coastal Policy Statement (2010).

The 2010 New Zealand Coastal Policy Statement is the result of a review of the 1994 New Zealand Coastal Policy Statement. New provisions relating to biodiversity in the coastal environment include the identification of natural character areas, and natural features and landscapes (which include biodiversity elements) in the coastal environment, which includes coastal vegetation and the habitat of indigenous coastal species. Policy 11 provides the philosophy for protecting indigenous biological diversity (biodiversity) in the coastal environment. This includes avoiding *any* adverse effects on threatened indigenous taxa, threatened indigenous ecosystems, important habitats of indigenous species, nationally significant examples of indigenous community types, areas set aside for the protection of indigenous biological diversity, and avoiding *significant* adverse effects on other areas containing indigenous biodiversity. Policy 13 requires the mapping or otherwise identifying at least areas of high natural character, and ensuring that regional policy statements and plans identify areas where preserving natural character requires objectives, policies and rules and include these provisions. This is in order to avoid any adverse effects on areas of outstanding natural character in the coastal environment, avoid significant adverse effects, and avoid, remedy or mitigate any other adverse effects in all other areas of the coastal environment. These provisions are similar in Policy 15 for natural features and natural landscapes in the coastal environment. The coastal environment contains a high amount of biodiversity in general. Identifying high natural character areas, and natural landscapes and including statutory provisions for their protection in these areas is a response to the high pressure of development on the coast, and will go some way to ease this pressure on biodiversity.

7.1.4 Northland Regional Policy Statement/Regional Plans

Regional Policy Statement For Northland (1999) (currently under review).

The Regional Policy Statement for Northland is formulated under the RMA, and provides the overarching framework for resource management in the region. It provides an overview of the region's significant resource management issues, and how they will be managed. Regional and district plans must 'give effect' to the directions of the Regional Policy Statement, ensuring common objectives and policies for managing resources in Northland. The current policy statement contains objectives, policies and methods relating to ecosystems and biodiversity, as a response to pressures (issues). These are:

1. Maintenance of the biodiversity of the Northland Region.
2. Protection of the life supporting capacity of ecosystems through avoiding, remedying or mitigating (in that order of priority) the adverse effects of activities, substances and introduced species on the functioning of natural ecosystems.
3. Protection of areas of significant indigenous vegetation and the significant habitats of indigenous fauna.

Policies and methods to achieve these objectives are then outlined, such as including methods to protect biodiversity in regional and district plans, promotion of voluntary initiatives and identifying relative values of areas containing indigenous vegetation, and the habitats of indigenous fauna. The regional policy statement is currently undergoing its statutory review, with a view to updating the statement in line with developments in legislation, public perception, and increased knowledge from the last version. Possible updates relating to biodiversity include: identifying significant natural areas and including policies and methods relating to the protection and management of these for the purpose of protecting biodiversity, recognising the economic benefits of protecting biodiversity, focusing on methods to protect biodiversity on private land, and incorporating the 2005 RMA amendment for *"...the establishment, implementation and review of objectives, policies and methods for maintaining indigenous biological diversity"* by regional councils, implying that regional councils now have a function to control activities specifically for the purposes of biodiversity protection through regional plans.

Regional Water and Soil Plan (2004).

This plan has not historically included rules controlling land use specifically for the maintenance of terrestrial biodiversity, as prior to the 2005 Resource Management Act amendments this was not a primary role for regional councils. However, biodiversity will benefit indirectly from measures in the plan such as restricting drainage and other disturbance activities in indigenous wetlands, controlling water takes from rivers, managing earthworks to limit sedimentation, standards for the discharge of contaminants to water and controlling earthworks and vegetation removal in Riparian Management Zones. The Plan also identifies outstanding lakes and rivers, which are subject to more restrictions on activities in these areas as a result of the outstanding values. The plan is due for its full review in 2014, and will have to incorporate any changes that are made to the Regional Policy Statement as outlined above, in particular this plan is likely to include controlling activities for the purposes of biodiversity maintenance if this method is employed. The Regional Water and Soil Plan will also have to include the new provisions of the New Zealand Coastal Policy Statement of mapping or otherwise identifying areas in the coastal environment up to the coastal marine area where preserving natural character and natural features and landscapes require objectives, policies and rules, and include those provisions.

Regional Coastal Plan (2003).

The Regional Coastal Plan for Northland covers resource management issues in the coastal marine area, and includes measures as a response to pressures on biodiversity in the coastal marine area. It includes objectives and policy on the preservation of the natural character of the coast, outstanding natural features and landscapes, and protection of significant indigenous vegetation and the habitats of indigenous fauna, which all directly or indirectly include indigenous biodiversity elements. There are no specific rules relating to the protection of biodiversity, although the introduction of exotic species into the coastal marine area is specifically prohibited. In the context of the coastal marine area, no activity is allowed unless permitted by a rule in a coastal plan. Consequently, more focus is placed on

assessing the potential effects on biodiversity of coastal permit applications. With the recent changes to the New Zealand Coastal Policy Statement, the Regional Coastal Plan will have to map or otherwise identify - for the coastal marine area – areas where preserving natural character and natural features and landscapes requires objectives, policies and rules, and include those provisions.

Regional Air Quality Plan (2003).

This plan also contains no provisions to specifically control activities for the purpose of protecting and maintaining biodiversity. However in general, biodiversity will benefit from good air quality, and it would be affected adversely if pollution to air was not controlled and regulated. Also, provisions regarding spray drift will benefit areas of indigenous vegetation in and bordering horticultural areas.

Regional Pest Management Strategies 2010-2015.

These are prepared under the Biosecurity Act (1993), and their purpose is to "provide a strategic and statutory framework for the efficient and effective management of pests in Northland." The effects of introduced pests are one of the main pressures affecting indigenous biodiversity in New Zealand, and pest management strategies are an important response to these. The strategies include an action plan for each pest, with objectives, management methods, and rules regarding management. Pests are grouped into plant, animal or marine pests and each identified pest is grouped according to a management class: exclusion, eradication, containment, suppression and risk assessment. Exclusion pests are not known to occur in Northland, and the aim is to prevent them from entering and establishing, e.g. Asian clam, crazy ant and cape tulip. Eradication pests are present in low numbers, have the potential to cause serious negative impacts and the intention is to remove them from the region, e.g. Mexican feather grass and feral deer. Containment pests are those which are established, but not widespread, and are able to be limited to a 'contained' area, e.g. koi carp and lantana. Suppression pests are widespread throughout the district, and the aim is to reduce densities so that impacts on the community and the environment are decreased, e.g. stylea sea squirt, gorse and argentine ant. Risk Assessment pests are of potential concern to the region, but little is known about them and understanding of the pest and its distribution needs to be increased, e.g. snake-neck turtle, shingle-back lizard and rainbow skink. Having strategies for the active management of these pests reduces the risk and adverse effects of alien species invasion on indigenous species, such as habitat competition and predation.

Northland Community Plan 2009-2019.

The Community Plan is prepared under the Local Government Act (2002), and sets out the direction for the Northland Regional Council for the next decade. It includes eight community outcomes including that: "Northland's natural environment is sustainably managed." Outcome indicators relating to biodiversity include: river water quality, environmental incidents, air quality, natural areas of ecological significance, and perceptions of managing the natural environment. Specific levels of service are set to measure the performance of these indicators, providing actions and information in response to pressures on biodiversity.

7.1.5 Whangarei District Council

Whangarei District Plan (2007).

Regional plans should provide the focus for biodiversity objectives and policies. However, these should also be formed within district plans, providing more local detail as necessary. The Whangarei District Plan includes policies and objectives for indigenous vegetation and habitat, water bodies, riparian and coastal margins, heritage trees, the coast, open space and landscape, which all directly or indirectly contribute to biodiversity in the district. Relevant policies include:

To recognise as significant, and provide protection for, indigenous vegetation and habitats of indigenous fauna, including indigenous wetlands, which are of moderate, moderate-high, high and outstanding value...

To maintain the ecological values of significant indigenous vegetation and the significant habitats of indigenous fauna in the Living 3, Countryside, Coastal Countryside, and Open Space Environments.

To promote the enhancement of areas of significant indigenous vegetation and significant habitats of indigenous fauna that have been, or may be degraded by inappropriate subdivision, use and development.

To avoid, remedy or mitigate the adverse effects of land use activities on areas of indigenous vegetation and significant habitats of indigenous fauna, including areas of value to tangata whenua... so as to maintain its ecological values.

To avoid, remedy or mitigate the adverse effects of goats in areas of indigenous vegetation and habitats of indigenous fauna, particularly in areas where they have been eradicated at Mt Manaia and Bream Head.

To avoid the introduction of plant and animal pests where practicable.

To encourage programmes for plant and animal pest control in areas of ecological value.

To recognise that dogs, cats and mustelids are a significant threat to kiwi.

To establish open space linkages between significant ecological sites and between public recreation areas in order to enhance biodiversity, physical ecosystem connections and recreational opportunities.

To protect indigenous vegetation, which contributes to the character and visual quality of landscapes from inappropriate subdivision, use and development.

To ensure that subdivision, use and development is managed in a manner that seeks to preserve, enhance and restore (where appropriate) the natural character of the coastal environment. Particular consideration should be given to: ...significant indigenous vegetation and significant habitats of indigenous fauna...

To set aside esplanade reserves or strips on the subdivision of allotments of less than four hectares where the land involved will serve one or more of the purposes of esplanade reserves or strips...

To maintain and, where appropriate, enhance riparian vegetation.

To ensure that the adverse effect of subdivision, use and development adjoining water bodies or the coastal marine area, or activities on the surface of water bodies or the coastal marine area, on water quality and quantity (including ground water), natural character, and cultural and ecological values of water bodies and the coastal marine area, are avoided, remedied or mitigated.

Regulatory methods employed in the District Plan, to achieve these policies and associated objectives include:

- Rules regulating the clearance of indigenous vegetation, vegetation planting, and indigenous wetland destruction.
- Subdivision and resource area rules relating to the taking of esplanade reserves on land adjacent to rivers and indigenous wetlands.
- Resource consents conditions protecting significant indigenous vegetation and the significant habitats of indigenous fauna, including conditions requiring bush covenants and, where appropriate, fencing.
- Identification of goat control areas on planning maps, and the provision of goat control rules relating to these areas.
- Identification of esplanade priority areas on planning maps, and a list of esplanade priority areas.
- Identification of outstanding landscape areas, and outstanding natural features, and notable landscapes areas on planning maps.
- Environmental benefit provision, whereby one extra allotment is allowed in exchange for the permanent protection of a significant natural feature.

Long Term Council Community Plan 2009-2019.

The Long Term Council Community Plan sets out a plan for decision-making and co-ordination of council resources, and provides a long-term focus for the decisions and activities of council, taking into account the aspirations of the community. A number of community outcomes are identified, including that Whangarei District is: “A sustainable, environmentally responsible district which values its natural uniqueness.” Indicators of progress on this outcome include: Consumer waste diversion choices, area under active management for kiwi recovery, weed management in DoC reserves, number and area of conservation covenants, compliance with land use consent conditions, annual kiwi call count in Whangarei District and number of public health warnings issued (recreational and shellfish gathering) for the upper harbour. Levels of service, i.e. actions to achieve this outcome in the 2009-2019 plan include: monitoring and reporting on the environment, planning initiatives to protect the environment, monitoring land use consents, processing land use consents and managing at least 145ha of natural areas as weed free.

7.1.6 Resource Consents

Resource consents allow an activity otherwise prevented by a rule in a regional or district plan. Without rules in plans and the provision for resource consents, development activity would be able to take place freely and biodiversity would be without protection from its effects. Many subdivision and land use activities have the potential to impact on biodiversity, and by controlling these activities (i.e. requiring consent) that directly impact on biodiversity, e.g. indigenous vegetation removal, placing conditions on consent, and taking biodiversity into account when considering consents, these are able to be mitigated. Some methods of using consents as a regulatory response to pressures on biodiversity include:

- Imposing mitigation measures (conditions on consent) to minimise any impact on the environment associated with resource consent applications i.e. management plans specifying fencing, exclusion of stock, animal and plant pest control, restrictions on pest animals and plants able to be kept, re-vegetation, payment of a bond to ensure measures are carried out, and monitoring of consent conditions for up to five years.
- Ensure conditions on consents are adequate to protect indigenous biodiversity, particularly on consents close to significant natural areas.

Table 22: Conditions Imposed On Conservation Covenants As A Component Of Resource Consents in 2006/07.

Perimeter fencing		75%
Management plan		86%
Exclusion of	Cats	29%
	Mustelids	25%
	Stock	50%
	Pigs and goats	4%
	Dogs	11%
	Pest plants	4%

- Give weight to subdivisions created using the management plan technique, and with designs which keep ecosystems intact preventing fragmentation, while locating residential lots in the most appropriate place i.e. avoiding headlands, prominent ridgelines, and back from the coastal edge.
- Ensure all development affecting the environment is adequately analysed for impacts over the long term. Ecological assessments should be completed for those resource consent applications with the potential to have a negative impact on the environment. These should be undertaken by a qualified experienced ecologist, and subject to peer review.

7.2 Other Plans And Strategies

Strategic documents are produced by all the organisations involved in environmental management. They are valuable tools which can be utilised to safeguard biodiversity values. Relevant documents responding to the pressures on biodiversity in the Whangarei District are outlined in this section.

7.2.1 Whangarei District Council

Whangarei District Growth Strategy, Sustainable Futures 30/50

Development and population growth have placed pressure on and threaten biodiversity in the Whangarei District, and these pressures will only continue to intensify in the future. The Whangarei District Growth Strategy has identified biodiversity as a significant issue that future growth will have to take account of, and that will need to be managed over the next 30/50 years. Biodiversity and associated values need to be taken into account when planning for future population growth/development and in allocating land in areas where growth is projected to occur. By implementing the long term settlement pattern outlined in the Growth Strategy, including consolidating growth and intensifying development in already compromised areas, the effects on biodiversity can be reduced.

The Open Spaces Strategy – Open Spaces Special Places (2001).

The beauty of the natural environment in the Whangarei District is in part due to large areas of open space with a high degree of naturalness. These areas generally also contain and provide habitat for important biodiversity. Cumulative effects of development pressure can contribute to the transition of a predominantly natural environment into one that is dominated by people. Even if vegetation clearance is minimal, the introduction of possible plant pests in gardens and pets threatens surrounding indigenous biodiversity. The open spaces strategy provides a direction for the acquisition and management of council reserves for the purposes of conservation, landscape, recreation and cultural values. The objective relating to biodiversity is to: “protect and enhance the areas of significant native vegetation and wildlife habitats”.

The Whangarei Coastal Management Strategy (2002) (Structure Plans adopted in 2009).

The coastal environment is characterised by a high degree of naturalness which contains many indigenous species of flora and fauna. Whangarei District in particular has a long coastline which attracts many visitors and is a defining aspect of the district. The popularity of the coast has placed a high pressure of development on biodiversity in this environment, and the coastal management strategy provides a local framework and principles for how this pressure is to be managed. The strategy contains nine specific study areas, with structure plans developed for each area.

7.2.2 Department of Conservation

Northland Conservation Management Strategy (1999-2009).

Conservation management strategies are 10-year regional strategies that provide an overview of conservation issues and give direction and set priorities for the management of public conservation land and waters, and species for which the department has responsibility. They provide for activities

such as protecting forests and wetland from pests, helping threatened species, restoring historic and cultural sites, providing visitor facilities, enabling appropriate commercial activities, assisting communities with their conservation projects, and creating marine protected areas. Conservation management strategies are a direct response to the pressures on biodiversity, as they implement biodiversity-focused legislation such as the Conservation Act, Reserves Act, and Wildlife Act. Specifically, the purpose of a conservation management strategy is:

> "to implement general policies and establish objectives for the integrated management of natural and historic resources, including any species managed by the Department under the Wildlife Act (1953), the Marine Reserves Act (1971), the Reserves Act (1977), the Wild Animal Control Act (1977), the Marine Mammals Protection Act (1978), the National Parks Act (1980), the New Zealand Walkways Act (1990) or this Act (the Conservation Act 1987), or any of them, and for recreation, tourism and other conservation purposes." (s.17D Conservation ACT 1987)

The Northland Conservation Management Strategy covers the Department of Conservation's Northland Conservancy and is currently under review.

Species Recovery Plans.

There are 10 species recovery plans for threatened species resident within the Whangarei District.

1. Kiwi Recovery Plan 2008-2018. The long-term goal is: "To restore and, wherever possible, enhance the abundance, distribution and genetic diversity of all kiwi taxa". A draft Taxon Plan for Northland brown kiwi which provides guidance to regional operations sits under this.
2. Pateke Recovery Plan 2005-2010. The long term goal is: "To recover Pateke populations so they are no longer threatened and are a national icon of wetland and forest ecosystem health and sustainable farming practices".
3. New Zealand Fairy Tern Recovery Plan 2005-2015. The long term goal is: to "Increase the number of New Zealand fairy terns to 100 by 2021. Then to increase the numbers of NZ fairy terns to at least 250 birds and the population to one capable of long-term survival, with minimal levels of protection maintaining the populations at key coastal sites".
4. New Zealand Dotterel Recovery Plan 2004-2014. The long term goal is: "Threats to northern New Zealand dotterels to be managed and habitat protected so that the present distribution is secured, the breeding range has expanded and the population has increased to at least 2200 birds by 2030".
5. Weka Recovery Plan 1999-2009. The long term goal is: "To restore all weka taxa to their traditional range as a significant component of mainland and island ecosystems ensuring that all taxa have the conservation status equivalent to Category "C" of Molloy and Davis, 1994, or lower".
6. Tuatara Recovery Plan 2001-2011. The long term goal is: "The genetic diversity of tuatara will be maintained by returning all existing populations to their natural levels and establishing new wild populations of tuatara throughout their pre-human range as components of healthy ecosystems".

7. New Zealand Large Galaxiid Recovery Plan 2003-2013. The long term goal is: "The current geographic range, habitat and genetic diversity of large galaxiid species are maintained and improved within New Zealand".
8. Kowhai Ngutukaka Recovery Plan. The management goal is: "To ensure the perpetuation of kowhai ngutukaka in the wild and the maintenance of its genetic diversity". Kakabeak was recorded in the 1800s from Maungatapere.
9. Coastal Cresses (Nau) Recovery Plan. The management goal is: "To ensure that viable populations of all extant coastal cress species are restored and self-sustaining in the wild throughout the natural range of these species". *Lepidium oleraceum* has been recorded from Bream Bay Islands.
10. *Dactylanthus taylorii* Recovery Plan 2004-2014. The vision is "*Dactylanthus* is secure throughout its natural range. *Dactylanthus* is locally abundant in self-sustaining populations. Key ecosystem interactions such as those with pollinators, dispersers, consumers and hosts are restored". *Dactylanthus taylorii* (wood rose) was recorded from Mt Aubrey in 1985.

Bream Bay Strategic Plan (2006).

In addition the Department of Conservation has produced the Bream Bay Strategic Plan (2006) in response to pressure on land resources in the area, primarily from industry and residential subdivision. The strategy describes the use and management of land under administration by the Department of Conservation, and includes; protection of sand dunes and estuaries, species protection, fire management, plant and animal pest control, public access, historic and archaeological protection, recreational activities, development, and conservation with the community.

7.2.3 Ministry for the Environment (MfE)

New Zealand Biodiversity Strategy (2000).

The New Zealand Biodiversity Strategy reflects New Zealand's commitment to ratifying the Convention on Biological Diversity, which we became a signatory of at the Rio Earth Summit in 1992. The convention is a response to biodiversity decline on a global scale. The New Zealand Biodiversity Strategy includes the measurable goal of halting the decline of biodiversity, but also increasing community understanding and involvement, actively protecting iwi and hapu interests in indigenous biodiversity, and maintaining the genetic resources of introduced species. The strategy establishes a framework for action to conserve and sustainably use and manage New Zealand's biodiversity, including outlining roles and responsibilities.

Statement of National Priorities For Protecting Rare And Threatened Native Biodiversity On Private Land (2007).

This document was a response by Government to the findings of the New Zealand Biodiversity Strategy review (Green and Clarkson, 2005) which identified:

- Ongoing loss of rare and threatened biodiversity from private lands.
- Dominance of economic drivers that favour the degradation of ecosystems (such as wetlands), rather than their active maintenance.

- Adverse impacts of animal pests on threatened species and forest ecosystems.
- Serious declines in the status of many acutely or chronically threatened species.

The priorities are intended to strengthen New Zealand's commitment to halting the decline of indigenous biodiversity by guiding resource management decisions on private land, and providing a baseline for protection when considering the effects of development.

The four national priorities are:

1. To protect indigenous vegetation associated with land environments that have 20% or less remaining in indigenous cover.
2. To protect indigenous vegetation associated with sand dunes and wetlands; ecosystem types that have become uncommon due to human activity.
3. To protect indigenous vegetation associated with 'originally rare' terrestrial ecosystem types not already covered by priorities 1 and 2.
4. To protect habitats of acutely and chronically threatened indigenous species.

These priorities have subsequently been included in the proposed National Policy Statement on Indigenous Biodiversity, and will be incorporated into statutory Resource Management Act policies and plans when finalised.

7.2.4 General Comments

In general, strategic documents should be consulted with the community, communicated once complete, and reviewed and updated regularly. Sound scientific monitoring can be used to establish the effectiveness of the contents of such documents, e.g. incentives, rules and actions. A specific biodiversity strategy for the Whangarei District is needed to direct and prioritise management activities and day-to-day decisions affecting biodiversity in the district. This may include strategic plans for priority species translocations as a response to pressures which can be implemented when needed, and contingency plans to minimise the impact of stochastic (random) catastrophic disturbances. Another necessary response to a decline in indigenous biodiversity in the district is establishing a policy and/or strategy for taking esplanade reserves. The provision to acquire an esplanade reserve is signalled when development occurs, and is a once-off opportunity and underutilised at present. Neglecting to procure important riparian margins now, may influence the ability to improve water quality and biodiversity in the future. Riparian margins play an important role in providing habitat for indigenous biodiversity, and vegetation along riparian margins are often important linkages between habitats. Corridors linking habitats can play an important role by increasing their function, as species can move between areas, and are more able to find the range of habitats necessary for their survival. Corridors also become important to link areas that may become refugia for species in times of climatic change, or other push factors. A district-wide, strategic approach is needed to address the procurement, maintenance and enhancement of these areas.

7.3 Protection, Restoration And Enhancement

Non-statutory and voluntary efforts are an invaluable response to the decline of biodiversity nationally, and in the Whangarei District. These include restoration and enhancement initiatives by community groups, landcare/coastcare groups, and other conservation organisations. Methods to protect and enhance biodiversity in the Whangarei District include:

- Managing council-owned land to protect biodiversity values i.e. invasive species control. Allocate funding to support this.
- Allocating funding for community and landowner-based biodiversity programmes i.e. Environmental Enhancement Fund.
- Establishing large-scale restoration projects in threatened ecosystems with local communities which incorporate connectivity e.g. Ngahere o Pukenui Management Plan.
- Encouraging the creation and management of conservation covenants, and esplanade reserves to protect waterways.
- Community initiatives such as The New Zealand Refining Company project "Pohutukawa Coast - Colour the District Crimson". This initiative resulted in the planting of 36,500 trees on private and public land of community benefit between 1989 and 2008.
- Creation of Community Pest Control Areas (CPCAs).
- Implementing control of invasive species and assessing the effectiveness of control.
- Eradicating invasive species from islands with concentrated populations of endemic or threatened species i.e. Matakohe Limestone Island.
- Managing dogs and stock to minimize the threat to native species.
- Implementing management of threatened species to maximize breeding success i.e. predator control, competitor control.
- Introducing (translocating) new individuals to boost the population.
- Landcare, coastcare groups carrying out pest and weed control, and enhancement initiatives.

7.4 Information, Monitoring And Research

Collecting information, monitoring and research, is the important feedback loop to informing how well policies and methods to protect biodiversity are working. This can be used to gain understanding on areas of progress, areas where no progress is being made, in setting priorities and resource decision making. An important part of this function in regional and local government is state of the environment monitoring. State of the environment monitoring helps with policy development and informs decision-makers of the consequences of actions and changes in the environment. It involves setting targets, monitoring, analysing and interpreting data, then reporting findings, and continuing this process over time (http://www.qp.org.nz/monitoring/state-env-monitor.php). Other important sources of information are consent monitoring, complaints monitoring and specific research.

Biodiversity Northland (see 7.5.3 for more information on Biodiversity Northland) has received funding for a project to provide web-based access to data on biodiversity, and natural areas of ecological significance. A data commons is envisaged. Data would be uploaded and maintained by parent

agencies but accessible to land management agencies and the public, who would also be able to manipulate data. It is important that information providers (e.g. local government, Department of Conservation) provide data for the Biodiversity Northland project, and enter into a data sharing and data management agreement.

Other important information, monitoring and research responses could include:

- Managing GIS spatial data effectively with regular input, a consistent compatible format, and quality control to minimise error.
- Managing biodiversity databases effectively i.e. conservation covenants, esplanade reserves/strips, environmental enhancement fund projects, biodiversity protection operations on Council land.
- Utilising consistent methodology during data collection.
- Making publications such as Protected Natural Area reports and State of the Environment reports readily available i.e. electronic, hard copy.
- Promoting the existence and availability of biodiversity data to the community.
- Monitoring biodiversity indicators at intervals and report on findings.
- Consider further monitoring/research of biodiversity in the district to improve understanding and make more robust decisions regarding land use and resource management. More quality data and information to assess the state of some biodiversity is required.

7.5 Education, Advocacy And Collaboration

7.5.1 Non-government Organisations

A number of national non-government organisations have branches within Whangarei District, whose staff and members are actively involved in biodiversity protection. These include Queen Elizabeth II National Trust, New Zealand Landcare Trust, Fish and Game New Zealand, Bank of New Zealand Save the Kiwi Trust, New Zealand Kiwi Foundation, Royal Forest and Bird Protection Society of New Zealand, the Ornithological Society of New Zealand Inc., New Zealand Herpetological Society Inc., and the Dune Restoration Trust of New Zealand. In addition a number of local community groups are making significant environmental gains; Friends of Matakohe/Limestone Island Society Inc., Pukenui/Western Hills Forest Charitable Trust, Bream Head Conservation Trust, Mountains to Sea Conservation Trust Nga maunga ki te moana, and Ngunguru Sandspit Protection Society Inc. Refer to Appendix I for a brief description of relevant organisations. Important responses from local government to these organisations include supporting and valuing the work they do through methods such as funding, publicity and other resources, communicating and consulting with environmental organisations in resource management decision-making, and utilising the expertise available within environmental organisations.

7.5.2 Tangata Whenua

Maori have a holistic view of the environment and biodiversity which derives from a belief system which links people and all living and non-living things. Maori believe all components of an ecosystem,

both living and non-living, possess the spiritual qualities of tapu, mauri, mana and wairua. Maori, as tangata whenua, are the kaitiaki (guardians) of these ecosystems and have a responsibility to protect and enhance them. This responsibility of people to other living things is expressed in the concept of kaitiakitanga – or guardianship. As their people are intrinsically linked with the natural world, the mana of the iwi, hapu or whanau is directly related to the well-being of the natural resources within their rohe.

The Resource Management Act 1991 requires Councils to take into account the principles of the Treaty of Waitangi in managing natural and physical resources, and in relation to iwi management plans Councils are required to "take into account any relevant planning document recognised by an iwi authority". Methods for incorporating Maori values in natural resource management could include:

- Understanding and valuing the Maori world-view is an essential step towards a bicultural approach to biodiversity management.
- Communicating and consulting with iwi and hapu over environmental issues. Ensure they are an active participant in resource management processes.
- Supporting and valuing the work iwi and hapu do i.e. resources, publicity.
- Establishing and supporting networks i.e. Iwi Technicians Forum, Te Karearea The Maori Liaison Committee for Whangarei District Council.
- Building capacity for involvement in biodiversity protection.
- Taking into account Iwi management plans. Three have currently been lodged with Whangarei District Council from Ngati Wai, Ngati Hine, and Patuharakeke
- Utilising the expertise available, e.g. matauranga maori.

7.5.3 Biodiversity Northland

Biodiversity Northland, formerly Northland Biodiversity Enhancement Group (NBEG), was established in 2000 as a forum to advocate for the protection of Northland's biodiversity. It was recognised, in an environment of limited resources, agencies and groups could not operate effectively in isolation and that partnership was the key to maximise outcomes for biodiversity. Working together also ensured a consistent approach, and the sharing of information and skills. Members of Biodiversity Northland include Northland Regional Council, Whangarei District Council, Kaipara District Council, Far North District Council, QEII Trust, NZ Landcare Trust, Fish and Game, Farm Forestry, Department of Conservation, Bank of New Zealand Save the Kiwi Trust, and the New Zealand Kiwi Foundation.

The achievements of Biodiversity Northland over the last ten years include organising regular forums, maintenance of a display at the annual Dargaville Field Days, publishing a self help guide for landowners 'Restoring the Balance', completing an investigation "Towards a Strategic Direction for Biodiversity Enhancement – the Whole of Northland Project", providing numerous workshops and training sessions for members of the public undertaking biodiversity protection, facilitating the flow of biodiversity information, and providing guidance to landowners and community groups on where to source funding.

It is an important response to maintain active membership in, and support initiatives proposed by Biodiversity Northland.

7.5.4 Education, Advocacy And Collaboration Methods from the District Plan

- Liaison with government and community groups.
- Liaison with iwi/hapu in regard to Iwi/Hapu Environmental Management Plans and ecological issues of concern to tangata whenua.
- Educate and inform resource users of the need for local sourcing of plant material.
- Investigate with landowners and other interested parties, the recording of other areas of significant indigenous vegetation and habitats of indigenous fauna, using the criteria within schedule 17A.
- Promote voluntary protection of significant indigenous vegetation or the significant habitats of indigenous fauna, through the use of protective covenants and other mechanisms, including fencing and rates relief schemes.
- Promote and support appropriate voluntary, self-regulating industry-based codes of practice and guidelines.
- Promote community awareness of the role of ecosystems and the importance of the protection of indigenous biodiversity, through plant and animal pest control programmes and other measures.
- Hold, and make available databases recording ecological information and maps detailing ecological areas within the district.
- Promote and support programmes to exclude dogs, cats and mustelids from known high-density kiwi habitat.

7.5.5 General Education, Advocacy And Collaboration Response To Pressures On Biodiversity

- Make available electronic databases and reports on biodiversity values i.e. Protected Natural Area Programme Reports, Threatened Environments, landscapes, Land Cover Database 2, conservation covenants to everyone involved in the resource consent process i.e. Council staff, iwi, consultants, applicants, community groups.
- Carry out education in the community on the existence of biodiversity information, and how it can be accessed and utilised.
- Inform and educate the community about the value of biodiversity protection on private land.
- Promote and conduct interagency communication and collaboration i.e. Biodiversity Northland, and inter-departmental communication and collaboration i.e. Resource Consents, Parks, Policy and Monitoring, with regard to resource consents. This is particularly important for the creation of protected areas i.e. esplanade strips and reserves, conservation covenants, and as a feedback mechanism for rules in policy documents.
- Maintain awareness of legislation, standard operating procedures for obtaining legitimate approval for harvesting, and local issues, through interagency communication.

- Advocate for responsible harvesting actions in the community.
- Decrease pollution through supporting Northland Regional Council incentives and education i.e. Dairying and Clean Streams Accord 2003, Drains to Harbour Storm Water Awareness Programme.
- Organise and support community clean-ups i.e. beaches, waterways.
- Place emphasis on co-operation and communication. Make local contacts and regional coalitions. Network and share with other groups i.e. locally, regionally, nationally.
- Engage the community. Communities and landowners must feel ownership of the project. Develop shared values and vision. Project leaders must provide motivation.
- Encourage media coverage to increase biodiversity awareness. Hold public celebrations and events.
- Develop positive relationships with landowners that engender mutual trust and information sharing, as much remaining biodiversity in the district is located on private land.
- Support the development of regional and district-wide umbrella groups. These would allow smaller groups to focus on project work without duplication of reporting, administration, compliance costs and responsibilities.

7.6 Economic Instruments

- FundView (www.fis.org.nz) is New Zealand's primary source of information about funding for voluntary organisations and contains over 600 different funding schemes. It includes funding from the government, local authorities, statutory and philanthropic trusts, gaming trusts and some service organisations. See Appendix H for funds available to community groups undertaking biodiversity protection. Access to the searchable database is limited to subscribers, but it can be viewed at Whangarei Public Library. In addition individuals and community groups can apply to generic funds i.e. Perry Foundation, Lottery Significant Projects Fund. In Whangarei District in 2009/10 the Community Conservation Fund supported; re-vegetation at Bream Head Scenic Reserve by the Bream Head Conservation Trust, Paradise Shore Duneland Restoration by the Bream Bay Coastal Care Group, Island re-afforestation by the Friends of Matakohe Limestone Island.

- Provision of rates relief as an incentive and method of compensation for those landowners who voluntarily covenant land, for the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna (District Plan method 17.5.4).

- Environmental benefit lot provision - Rule 73.3.2 in the Whangarei District Plan provides for the creation of an extra lot during proposed subdivision, in exchange for the permanent protection of a significant natural feature, such as stands of indigenous vegetation or indigenous fauna habitat.

- Environment Fund – the Northland Regional Council provides funding for a variety of biodiversity protection and restoration activities to help enhance and protect Northland's

natural environment, including wetlands protection and enhancement, plant and animal pest control, revegetation with native plants, coastal dune enhancement and protection and stock exclusion from the coastal marine area. This approx. $500,000 contestable fund has been available since 1996 and contributes up to 50% of the total project cost. The fund is distributed in line with set priorities including soil conservation, biodiversity, coastal and water quality. In the 2009-10 year, 43 projects (34.7%) were funded in the Whagnarei District. Of the total projects funded, 22% were biosecurity focused, 8% involved replanting, 4% were located on coastal dunes, 18% involved work in wetlands, 19% were located in the coastal marine area, and 29% were general.

7.7 Review Of Response To Pressures

This section provides an assessment of the effectiveness of the measures in place to protect biodiversity in the district, as a response to pressures on biodiversity. The use of indicators such as indigenous vegetation and land cover, incidence of threatened and at risk species, and subdivision and development data can be used to evaluate how well objectives relating to biodiversity have been achieved. Objectives relating to biodiversity in the Whangarei District include:

National

New Zealand Biodiversity Strategy:

- Community and individual action, responsibility and benefits.
- Treaty of Waitangi.
- Halt the decline in New Zealand's Biodiversity.
- Genetic resources of introduced species.

New Zealand Coastal Policy Statement:

- To preserve the natural character of the coastal environment and protect natural features and landscape values through:
    - recognising the characteristics and qualities that contribute to natural character, natural features and landscape values and their location and distribution;
    - identifying those areas where various forms of subdivision, use, and development would be inappropriate and protecting them from such activities; and
    - encouraging restoration of the coastal environment.

Objectives from the proposed National Policy Statement on Indigenous Biodiversity have not been included, as it has not yet taken effect.

Regional

Regional Policy Statement for Northland:

- Maintenance of the biodiversity of the Northland Region.
- Protection of the life-supporting capacity of ecosystems through avoiding, remedying or mitigating (in that order of priority) the adverse effects of activities, substances and introduced species on the functioning of natural ecosystems.

- Protection of areas of significant indigenous vegetation and the significant habitats of indigenous fauna.

Northland Conservation Management Strategy:

- To survey and describe natural habitats and ecosystems within Northland to enable the identification of priority areas for protection.
- To achieve protection of the most threatened, rare and/or representative natural areas.
- To encourage landowners, the Northland Regional Council and local authorities to apply legal mechanisms to protect and restore remnant natural habitats.
- To endeavour to prevent the extinction of any indigenous species in the Conservancy and maintain the diversity, viability and health of populations and communities of indigenous plant and animal species.
- To maintain viable breeding populations of indigenous species in their appropriate habitat, and in particular improve the status of threatened species.
- To increase public awareness of threatened species, their conservation requirements and opportunities for community involvement in species management.

District

Whangarei District Plan:

- Maintenance and enhancement of the life-supporting capacity of ecosystems, and the biodiversity of the district.
- Protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna from inappropriate subdivision, use and development.

The following analysis aims to assess how well these objectives are being achieved in the Whangarei District within the current framework for biodiversity protection. Objectives are grouped into different themes and various indicators used to assess the achievement of these.

7.7.1 Maintenance Of Biodiversity

Halt the decline in New Zealand's biodiversity (New Zealand Biodiversity Strategy).

Maintenance of the biodiversity of the Northland Region (Regional Policy Statement for Northland).

To endeavour to prevent the extinction of any indigenous species in the Conservancy and maintain the diversity, viability and health of populations and communities of indigenous plant and animal species (Northland Conservation Management Strategy).

To maintain viable breeding populations of indigenous species in their appropriate habitat, and in particular improve the status of threatened species (Northland Conservation Management Strategy).

During 1996/97 – 2001/02, New Zealand as a whole lost around 16,000ha of native land cover (Ministry for the Environment, 2007). Approximately 2,200ha of this was lost in Northland, contributing to about 14% of this total. The Northland region disproportionately added to native land cover loss over this period, as it does not cover 14% of total land area (4.7%). During the same period 284ha of

indigenous land cover was lost from the Whangarei District, including fernland, grey scrub, indigenous broadleaved hardwoods, indigenous forest and manuka/kanuka.

In addition, there are 45 'Threatened' and 160 'At Risk' plant and animal species in the district. The presence of these species indicates a decline in biodiversity, as to be classified as threatened and at risk implies a decline in numbers. In the years from 2002 – 2005, nationally 40 species were considered to have genuinely worsened in threat status according to the New Zealand threat classification system. The Whangarei District contained three of these species - the grey duck (serious decline to nationally endangered), ornate skink (not threatened to gradual decline) and forest ringlet butterfly (gradual decline to serious decline). This implies losses of indigenous biodiversity, and indicates such biodiversity objectives as maintenance of biodiversity in the Northland Region, halting the decline of indigenous biodiversity, maintaining viable breeding populations of indigenous species in their appropriate habitat, and in particular improving the status of threatened species are not being met. There has been no update since 2005 to assess recent trends, but during 2002 – 2005, only five species were considered to have genuinely improved in threat status nationally. Unless there has been a significant change and strengthening of biodiversity management in the last five years, it can be expected that significantly less species are increasing in threat status than decreasing.

No extinctions have occurred in the Whangarei District. However, the above data shows that in general, biodiversity is declining, despite specific statutory goals that this should not happen. This indicates that the current provisions in place to maintain biodiversity, are not achieving statutory objectives. However, specific management of certain species has meant that in some areas biodiversity is improving. Average numbers of Pateke (brown teal) at Northland flock sites have increased from 2002 levels, North Island brown kiwi population is up 69% from 2001, and the number of breeding pairs of fairy terns has increased since 2004. In 2008/09, the Department of Conservation reported improved security for four acutely threatened species (New Zealand fairy tern, Pateke (brown teal), New Zealand dotterel, *Amborhytida tarangiensis*), two at risk species (Turbott's weevil, *Placostylus hongii*) and one chronically threatened species (North Island brown kiwi) within the Whangarei Area of the Northland Conservancy. Additionally, the number and area of formal conservation covenants are increasing each year as landowners choose or are required to protect areas of native habitat. These increases will help to protect biodiversity on private land, and in general by preserving the habitats of indigenous species.

7.7.2 Protecting/Maintaining The Life-supporting Capacity Of Ecosystems And Biodiversity

Protection of the life-supporting capacity of ecosystems through avoiding, remedying or mitigating (in that order of priority) the adverse effects of activities, substances and introduced species on the functioning of natural ecosystems (Northland Regional Policy Statement).

Maintenance and enhancement of the life-supporting capacity of ecosystems, and the biodiversity of the district. (Whangarei District Plan).

In terms of maintaining the life-supporting capacity of ecosystems, the decline in and fragmentation of indigenous vegetation directly threatens this objective. The loss of even a small amount of one native

habitat type, if it is rare anyway, will have significant effects on species relying on this ecosystem for survival. This may result in local extinctions. The loss for individual species and genetic diversity may be far greater than just a loss in habitat. Also, even small amounts of indigenous vegetation loss can have other effects beyond the direct removal of vegetation, such as increasing edge effects (i.e. pest invasion potential), and habitat fragmentation. Thus, the loss of functioning ecosystems may be far greater than direct loss of vegetation.

According to a study by Ewers et al. (2006), the majority of deforestation (please note that this study only analysed indigenous forest cover, rather than the broader 'native land cover') over the period 1996/97 – 2001/02 was in the North Island, and over half of that was from the Northland Region. 'Nearly 40% of forest loss that occurred in New Zealand from 1997 – 2002 occurred in Northland, which also contains some of the most fragmented forest in New Zealand.' Typically deforestation rates were small (3.3 – 6.5ha) but even small losses contribute to the cumulative effects of native vegetation loss, or a 'death by a thousand cuts'. The study also predicts that Northland has already passed a critical 'extinction threshold' of around 30% forest cover, where below this value 'there is often an abrupt increase in the gap structure of landscapes, a marked discontinuity in dispersal between sub-populations and a sharp decline in the probability of metapopulation persistence', i.e. extinctions are more likely to occur. To restore this threshold by 2050, it was estimated that 547ha of forest would need to be regenerated per year (assuming native scrub is considered to be forest). Without the assumption of native scrub being forest, the figure is 3,909ha per year).

A further issue facing indigenous biodiversity in Northland relates to the isolation and fragmentation of indigenous habitats. In the previously mentioned study by Ewers et al. (2006), Northland is identified as containing some of the most fragmented forest in New Zealand. This can contribute to the further loss of functioning ecosystems, even though vegetation may remain. The 'edge effects' on isolated patches of vegetation leave them open to invasion by plant and animal pests, and they may not be of a size where they can support healthy populations of indigenous species. Once habitats become smaller and more fragmented they may also be seen as less useful, and therefore be seen as having less justification for protection. Cleary, the life-supporting capacity of ecosystems is under threat in Northland and the Whangarei District, and even though good efforts may be being made at the individual project scale, the statutory methods to achieving this on a district-wide scale are still inadequate.

Corridors linking fragmented habitats can play an important role by increasing their function, as species can move between areas, and are more able to find the range of habitats necessary for their survival. Corridors also become important to link areas that may become refugia for species in times of climatic change, or other push factors. Often important linkages between habitats are along riparian margins. A region-wide, and district-wide strategic approach is needed to address the maintenance and enhancement of these areas.

7.7.3 Preservation Of Natural Character of the Coast

To preserve the natural character of the coastal environment and protect natural features and landscape values (New Zealand Coastal Policy Statement).

From 1996 – 2009, 6% of new lots created, and about 7% of land use consents granted were in the Coastal Countryside Environment. However, development is likely to be higher in the coastal environment, as the Coastal Countryside Environment in the District Plan does not cover the whole coast line of the district. The figures also do not include development in areas classed as Living Environments in coastal settlements.

The preservation of the natural character of the coastal environment and the protection of outstanding natural features and landscapes are matters of national importance under section 6 of the Resource Management Act. Inappropriate development along the coast directly threatens the objective of preserving natural character in the coastal environment, and impacts on indigenous biodiversity in these areas. An excerpt from the Whangarei District Landscape Assessment by LA4 landscape architects (LA4, 1995) states that "some of the more recent development, such as that found around Te Waite Bay (Tutukaka), extends out onto much more sensitive coastal headland ridgelines and exposed flanks. Such development is generating significant negative effects in some of the highest rating portions of the district's coastal landscape, despite its relatively low intensity."

This quote highlights the fact, that although the coastal environment may not be where the majority of development is occurring in the district, the sensitive and visible nature of the environment means that the impact on natural character is greater. This is particularly relevant in some, high profile areas such as Langs Beach and increasingly, Tutukaka. The fact that these areas have been able to be developed to such a high level indicates that current statutory methods for protecting natural character in the coastal environment may not be sufficient. The fact that other areas are not yet developed to such a high level may only be a matter of time and chance. An assessment needs to be made of areas where natural character in the coastal environment needs to be protected, and measures to enforce this included in regional and district plans.

7.7.4 Protection Of Significant Indigenous Vegetation and Significant Habitats

Protection of areas of significant indigenous vegetation and the significant habitats of indigenous fauna (Northland Regional Policy Statement).
To achieve protection of the most threatened, rare and/or representative natural areas (Northland Conservation Management Strategy).
Protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna from inappropriate subdivision, use and development (Whangarei District Plan).

In terms of increasing protection of significant areas of biodiversity, the number and area of formally protected conservation covenants (including QEII) is increasing all the time. These are voluntary mechanisms however, and not enough to maintain the balance between protection of biodiversity,

and biodiversity loss. Now that protected natural areas reports have been completed for most of the district, there is information on areas that are most in need of protection because of their biodiversity significance and lack of current protection. More formal protection and maintenance of areas will require significant monetary inputs, but may be an option in the longer term, as current statutory mechanisms targeting individual projects are not proving entirely effective.

The third objective relies on the interpretation of the word 'inappropriate'. We can conclude from subdivision and land use consent data (section 6), that there was development in significant areas of indigenous vegetation and significant habitats of indigenous fauna (kiwi habitat). Some judgement is needed as to whether this development was *inappropriate* or not. Approximately 16% of new lots and 12% of land use consents were granted in significant natural areas during 1996 – 2009. Also 26% of new lots and 25% of land use consents were granted in areas defined as kiwi habitat (1996 – 2009). This seems inappropriate, as the cumulative effects of development in significant natural areas, including areas of significant indigenous vegetation, and significant habitats of indigenous species contribute to the transition of a predominantly natural environment to one that is dominated by people. Even if vegetation clearance is minimal, the introduction of possible plant pests in gardens and pets threatens surrounding indigenous biodiversity and the above objectives. Thus the provisions of the District Plan do not appear to be achieving specified objectives with regards to indigenous biodiversity in the Whangarei District. Indicators of achievement would be minimal development in significant natural areas and kiwi habitat, and an increase or at least no decrease in the amount of indigenous vegetation in the district.

7.7.5 Indigenous Biodiversity Information

To survey and describe natural habitats and ecosystems within Northland to enable the identification of priority areas for protection (Northland Conservation Management Strategy).

This has been achieved through the completion of the Protected Natural Areas Programme reports. The reports for ecological districts that cover the Whangarei District have now all been finished except for the Tokatoka Ecological District. Reports for the Poor Knights and Taranga (Hen and Chicken Islands) ecological districts will not be published.

7.7.6 Education And Information On Biodiversity

Enhance community and individual understanding about biodiversity, and inform, motivate and support widespread and coordinated community action to conserve and sustainably use biodiversity (New Zealand Biodiversity Strategy).

Actively protect iwi and hapu interests in indigenous biodiversity, and build and strengthen partnerships between government agencies and iwi and hapu in conserving and sustainably using indigenous biodiversity (New Zealand Biodiversity Strategy).

Enable communities and individuals to equitably share responsibility for, and benefits from, conserving and sustainably using New Zealand's biodiversity, including the benefits from the use of indigenous genetic resources (New Zealand Biodiversity Strategy).

To encourage landowners, the Northland Regional Council and local authorities to apply legal mechanisms to protect and restore remnant natural habitats (Northland Conservation Management Strategy).
To increase public awareness of threatened species, their conservation requirements and opportunities for community involvement in species management (Northland Conservation Management Strategy).

In 2008/09, the Department of Conservation reported improved *understanding* for 10 threatened and at risk species in the Whangarei area of the Northland Conservancy. These included: New Zealand fairy tern, Pateke (brown teal), North Island brown kiwi, black mudfish, Hochstetter's frog, Turbott's weevil, skink: *Cyclodina mokohinau*, snail: *Placostylus hongii*, and plants: *Hebe bishopiana*, *Pittosporum obcordatum*.

In terms of encouraging landowners to apply legal mechanisms to protect and restore remnant natural habitats, progress has been made on this, identified by the increasing number and area of conservation covenants in the Whangarei District. In terms of other engagement and enabling objectives, these are hard to assess, given the lack of feedback from organisations. It may be worthwhile in future to undertake a survey of perceptions of the public, and conservation organisations over how involved in /aware they feel about biodiversity issues in the district in order to asses how these objectives are being achieved.

7.7.7 Future Responses To Pressures On Biodiversity In The Whangarei District

Although some good progress is being made, in general, biodiversity objectives are not wholly being achieved in the district, or there is a lack of information to correctly assess the situation. This implies that current responses relating to maintaining biodiversity or halting its decline are not working as they should.

Consolidation of development by increasing the proportion in specified living environments and identified growth areas as identified in the Whangarei District Growth Strategy will help to achieve biodiversity objectives in the future, as adverse effects will be contained. The requirement of the proposed National Policy Statement on Indigenous Biodiversity to map or otherwise identify areas of significant indigenous fauna, and to consider these areas when assessing any matter (i.e. resource consents, private plan changes) will also assist at the project level when making resource management decisions.

The following section outlines other possible solutions and options to strengthen responses to achieve biodiversity focused objectives in the future, and protect our indigenous biodiversity from the increasing pressures faced by it in the district.

8. Conclusions And Future Options

The natural environment of the Whangarei District contains many and varied landscapes, providing a diverse range of habitats and promoting a high level of biodiversity. The natural environment plays an important role in defining the character of the district. It has been shown that one of the main reasons people come to Northland is the quality of the environment, and the main reason for staying, is again the environment (Ministry for Culture and Heritage and Statistics New Zealand, 2003). Development such as tourism, agriculture, forestry, fishing, aquaculture, and mining are all dependent upon sustained and managed natural resources including biodiversity. Thus, a sustainable economy is also dependent upon a sustainable natural environment. However, the sustainability of our natural environment is under pressure from many threats to biodiversity, including habitat destruction, introduced pests, weeds and pollution.

In order to stop the decline of biodiversity in the district, and continue efforts to improve it, we need to manage and respond to the pressures causing this decline. A range of statutory and non statutory methods are currently in place, as outlined in Chapter 7, but are not proving effective in achieving statutory objectives regarding biodiversity. There are a number of options available to assist future efforts to stop the decline of biodiversity in the district, and achieve statutory objectives. These options are advanced for further consideration by Council. It is acknowledged that not all can be implemented over the short term, and they must be prioritised and incorporated into Council functions over time. It is intended to examine the options contained in this section, along with timelines for implementation, in the proposed WDC Biodiversity Strategy.

8.1 Regulatory Mechanisms

- Provide input to current and future national initiatives on indigenous biodiversity (e.g. National Policy Statements, national standards) to ensure they will be effective in the district.

- Provide input into regional planning documents (e.g. current Regional Policy Statement review) to ensure they will enhance indigenous biodiversity in the district.

- Review policies and methods relating to biodiversity in the District Plan, as intended as part of the rolling review, to ensure they will be effective in achieving biodiversity objectives. Have regard to the following:

  – Rationalise rules regarding indigenous vegetation clearance in outstanding and notable landscapes. Currently rules regarding indigenous vegetation clearance are more onerous in the Living 3, Countryside, Coastal Countryside and Open Space Environments than in outstanding and notable landscape resource areas, despite clear and strong statutory direction to protect the natural character of outstanding landscapes.

  – Consider including similar, less restrictive policies in identified buffer zones around significant natural areas as well.

- Consider including district wide objectives, policies and methods in the District Plan for protecting other indigenous biodiversity, not just that classed as 'significant', as all indigenous biodiversity contributes to the life-supporting capacity of ecosystems. These could include:
    - No extinction of indigenous species from the district.
    - No significant reduction in the natural range of indigenous species across the district.
    - No loss of indigenous ecosystem types.
- Include objectives, policies and methods (rules) in the District Plan to address the requirements of Policy 11 (Indigenous Biodiversity) of the New Zealand Coastal Policy Statement.
- Strengthen objectives, policies and methods targeted towards protecting riparian margins. Also include methods to achieve Policy 11.4.6 (*To maintain and, where appropriate enhance riparian vegetation*).
- Include effective methods (including rules) for achieving objectives and policies relating to indigenous biodiversity, e.g. 17.4.5C (*To recognise that dogs, cats and mustelids are a significant threat to kiwi).*

- Map or otherwise identify areas of significant indigenous vegetation and significant habitats of indigenous fauna in the district (as will likely be a requirement of the National Policy Statement on Indigenous Biodiversity) and include in the District Plan as a resource area. Include objectives policies and rules regarding the impacts of subdivision and land use on biodiversity in these areas e.g. no cat/dog covenants, restrictions on vegetation clearance, pest and weed control, etc.
- Include by mapping or otherwise identifying areas of high natural character, and natural features and landscapes in the coastal environment and include objectives, policies and rules required to preserve natural character and protect natural features and landscapes in the District Plan as required by the New Zealand Coastal Policy Statement (Policy 13).
- Identify areas where the natural character of the coast, and natural features and landscapes require protection. Include provisions in regional and district plans to protect these areas from inappropriate subdivision, use and development, as required by the New Zealand Coastal Policy Statement (Policy 15).
- Ensure that esplanade reserves and/or strips are taken whenever the opportunity arises, particularly in esplanade priority areas. Develop and extend ecological corridors and improve public access.
- Ensure conditions on consents are adequate to protect indigenous biodiversity, particularly on consents close to significant natural areas. Impose mitigation measures to minimise any impact to the environment associated with resource consent applications, e.g. management plans specifying fencing, exclusion of stock, animal and plant pest control, restrictions on pest

animals and plants able to be kept, re-vegetation, payment of a bond to ensure measures are carried out, and monitoring of consent conditions.

- Take District Plan objectives and policies into account when considering resource consent applications, not only rules, to ensure wider resource management issues are being addressed.
- Utilise non regulatory and other methods relating to achieving objectives for indigenous vegetation and habitat outlined in the District Plan (s17.5).

8.2 Other Plans And Strategies

- Implement the long term settlement pattern identified in the Whangarei District Growth Strategy to minimise development in areas in close proximity to significant natural areas and potential adverse effects on indigenous biodiversity.
- Develop a Biodiversity Strategy for the Whangarei District in order to identify and address the significant threats to biodiversity, prioritise areas where biodiversity is most threatened and identify actions and methods to help protect and restore these areas. Include the importance of retaining urban biodiversity, and urban blue/green corridors. This will complement existing Reserves Strategy, Growth Strategy, and future Rural Strategy.
- Identify remnant indigenous vegetation, serving as ecological linkages for a 'green and blue network' plan. This should include a strategy for obtaining esplanade reserves when the opportunity arises. This will be able to prioritise locations for obtaining esplanade reserves, e.g. on private land in significant natural areas, in an integral part of a catchment, or part of an ecological corridor.
- Take iwi and hapu environmental management plans into account when formulating resource policy/rules.

8.3 Protection, Restoration And Enhancement

- Develop pest management plans for priority council reserves.
- Lobby Northland Regional Council to create regional parks to increase protection of biodiversity. These could be targeted towards significant natural areas that are as yet unprotected, e.g. Brynderwyns and Ngunguru Sandspit.
- Identify and prioritise areas where existing human activity impacts on ecological/biodiversity health (e.g. waterways through the city centre). Target specific actions to minimise these impacts.
- In conjunction with other agencies, establish a network of connected protected areas to ensure habitat availability for indigenous biodiversity.
- Support the establishment of restoration projects in threatened ecosystems with local communities which incorporate connectivity, e.g. Ngahere o Pukenui Management Plan.

- Support community initiatives such as the New Zealand Refining Company project "Pohutukawa Coast – Colour the District Crimson". This initiative resulted in the planting of 36,500 trees on private and public land of community benefit between 1989 and 2008.
- Support community organisations involved in conservation and biodiversity enhancement, such as landcare groups, coastcare groups, Whangarei Heads Landcare Forum, New Zealand Kiwi Foundation, Friends of Matakohe/Limestone Island, Ngunguru Sandspit Protection Society, Bream Bay Action Group and others.

8.4 Information, Monitoring And Research

- Continue conservation covenant monitoring to gain information on the state of biodiversity on private land.
- Consider further monitoring/research of biodiversity in the district to improve understanding and make more robust decisions regarding land use and resource management. There needs to be more quality data and information to assess the state of some biodiversity and potential impacts of development.
- Undertake a survey of public and interest group perceptions of how well they feel these objectives are being achieved and how involved in /aware they feel about biodiversity issues in the district in order to assess progress on biodiversity education and engagement objectives.
- There is a need for more information on biodiversity in the district. Often determining the trends in species numbers and distribution is hampered by a lack of data. By measuring indicators at regular intervals, we will be able to make decisions over whether the methods and provisions in the district plan are adequate for protecting biodiversity.
- Regularly report on the state of biodiversity within the district to measure progress and effectiveness of responses to biodiversity, using the following indicators:

Biodiversity:

- Threatened and at risk species present within the district
    i. Total number of threatened and at risk species present within the district (currently 205).
    ii. Number of specific threatened and at risk species that are subject to management programmes and have data, e.g. Pateke (brown teal) and New Zealand fairy tern.
    iii. Distribution area of North Island brown kiwi.
    iv. Number of threatened species in the district that have become more threatened according to the New Zealand threat classification system.
- Total number and area (ha) of formally protected area in the district
    i. Total number and area (ha) of conservation covenants within the district.
    ii. Total number and area (ha) of QEII covenants within the district.

- Distance of riparian margins protected by some mechanism, e.g. covenant, esplanade reserve, within conservation/reserve land.
- Total area (ha) of indigenous land cover loss.
- Macroinvertebrate Community Index – indicator of stream health.
- Stream habitat assessments.

Threats:

- Percentage of lots created/land use consents granted in kiwi habitat.
- Percentage of lots created/land use consents granted in areas identified by Protected Natural Areas Programme.
- Percentage of lots created/land use consents granted in acutely and chronically threatened environments.
- Distribution/abundance of pest species, e.g. goats, pigs, deer.

8.5 Education, Advocacy And Collaboration

- Consider joint management strategies where significant ecological areas cross boundaries, e.g. Brynderwyns.
- Fund implementation of environmental education strategy and/or carry out education in the community on the existence of biodiversity information, and how it can be accessed and utilised.
- Decrease pollution through supporting incentives and education by Northland Regional Council e.g. Dairying and Clean Streams Accord 2003, Drains to Harbour Stormwater Awareness Programme.
- Collaborate with other agencies in formulating the Whangarei Harbour Integrated Management Strategy (WHIMS).
- Make available electronic databases and reports on biodiversity values, i.e. Protected Natural Area reports, Threatened Environment database, outstanding landscapes, Landcover Database 2, conservation covenants, to everyone involved in the resource consent process, i.e. council staff, iwi, consultants, applicants, community groups.
- Promote and conduct interagency communication and collaboration, e.g. Biodiversity Northland, and inter-departmental communication and collaboration, e.g. resource consents, parks, policy and monitoring, with regard to resource consents. This is particularly important for facilitating the creation of protected areas, i.e. esplanade reserves and strips, conservation covenants, and as a feedback mechanism for rules in policy documents.

- Support the development of regional or district-wide umbrella groups. These would allow smaller groups to focus on project work without duplication of reporting, administration, compliance costs and responsibilities.
- Consider appointment of community biodiversity co-ordinator to:
    - Facilitate establishment of community groups.
    - Facilitate and encourage linkages between groups and communities.
    - Explore and develop strategic links between schools, migrant and disability communities and community environmental groups.
    - Co-ordinate/implement and biodiversity initiatives in the community.

8.6 Economic Instruments

- Apply for funding (such as the biodiversity advice and condition funds) to assist and advise landowners in protecting biodiversity on private land.
- Consider setting up an environmental enhancement fund, as has been done in the past to assist landowners to improve biodiversity on private land.
- Provide assistance to community groups and landowners involved in conservation and biodiversity enhancement. This may be in the form of advice, staff time etc.
- Recognise and include the benefits of biodiversity and ecosystem services in economic development strategies, tourism strategies, and marketing initiatives etc.
- Consider the use of development contributions for strategic purchase of open space and reserves, to protect and maximise benefits to biodiversity (e.g. biodiversity corridors).
- Implement the economic instruments/methods relating to indigenous vegetation and habitat outlined in the District Plan, such as:
    - financial contributions relating to subdivision development,
    - annual plan allocation for assisting other protection agencies,
    - provision of rates relief as an incentive and method of compensation for those landowners who voluntarily covenant land for the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna,
    - Consideration of a waiver or reduction of subdivision consent application fees where the sole or principal purpose of the subdivision is protection of indigenous vegetation or significant habitats of indigenous fauna.

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- www.mfe.govt.nz Ministry for the Environment
- www.nrc.govt.nz Northland Regional Council
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Appendices

Appendix A – Pest Animal And Plant Species Listed In The Northland Regional Pest Management Strategy (2007).

Section 3.2 Pest Animal Designations

Pest Animal	Service Delivery	Cost Recovery	Surveillance	Community Control
Feral cat		X		X
Weasel		X		X
Stoat		X		X
Ferret		X		X
Rat (Norway, Ship)		X		X
Feral deer	X	X		
Goat	X	X		X
Rabbit	X	X		X
Hare		X		X
Wallaby	X		X	
Possum	X	X		X
Rook	X		X	
Myna		X		
Magpie		X		

Aquatic Pests (adopted 2006)

Koi carp

Rudd

Tench

Perch

Orfe

Catfish

Aquatic Weeds (adopted 2006)

Lagarosiphon major

Egeria densa

Parrots feather

Hornwort

Alligator weed

Pest Ants (adopted 2006)

Argentine ant

Darwin's ant

Surveillance ants: big headed ant, tropical fire ant, crazy ant, ghost ant

3.3 Pest Plant Designations

Pest plant	Service Delivery	Total Control	Boundary Control	Quarry	Community Control	Roadside	Surveillance	Advice Only
African feathergrass	X							
Alligator weed								X
Bathurst bur		X						
Broom			X	X		X		
Californian thistle		X						
Eel grass	X						X	
Entire marshwort	X						X	
Fringed water lily	X						X	
Gorse			X	X		X		
Houttuynia	X						X	
Hydrilla	X						X	
Lantana	X							
Manchurian ricegrass	X							
Mothplant					X	X		
Nardoo	X						X	
Nassella tussock	X							
Needlegrass	X						X	
Nodding thistle		X						
Old man's beard	X						X	
Oxygen weed								X
Pampas			X	X		X		
Parrots feather								X
Privet			X		X	X		
Ragwort			X					
Rhamnus	X						X	
Senegal tea	X						X	
Skeleton weed	X						X	
Spartina	X	X						
Water poppy	X						X	
Wild ginger			X	X	X	X		

Appendix B - National Pest Plant Accord (2008) First Schedule

Common Name/s Scientific Name

African feather grass *Pennisetum macrourum*

African fountain grass *Pennisetum setaceum*

African love grass *Eragrostis curvula*

Alligator weed *Alternanthera philoxeroides*

Arrowhead *Sagittaria montevidensis*

Arrowhead; Hawaii Arrowhead *Sagittaria sagittifolia*

Balloon vine *Cardiospermum grandiflorum*

Banana passionfruit *Passiflora mollissima*

Bartlettina *Bartlettina sordida*

Bladderwort *Utricularia gibba*

Blue morning glory *Ipomoea indica*

Bog bean *Menyanthes trifoliata*

Bone seed *Chrysanthemoides monilifera spp. monilifera*

Bur reed *Sparganium erectum*

Cape tulip *Homeria collina*

Cathedral bells *Cobaea scandens*

Caulerpa taxifolia *Caulerpa taxifolia*

Chameleon plant *Houttuynia cordata*

Chilean flame creeper *Tropaeolum speciosum*

Chilean rhubarb *Gunnera tinctoria*

Chinese pennisetum *Pennisetum alopecuroides*

Christmas berry *Schinus terebinthifolius*

Clasped pondweed *Potamogeton perfoliatus*

Climbing asparagus; ferny asparagus *Asparagus scandens*

Climbing spindleberry; oriental bittersweet *Celastrus orbiculatus Thunb.*

Coltsfoot *Tussilago farfara*

Darwin's barberry *Berberis darwinii*

Devil's tail tearthumb *Persicaria perfoliatum*

Eelgrass *Vallisneria gigantea*

Egeria; oxygen weed *Egeria densa*

Elephant grass; Napier grass *Pennisetum purpureum*

Entire marshwort *Nymphoides geminata*

Eurasian watermilfoil *Myriophyllum spicatum*

Evergreen buckthorn *Rhamnus alaternus*

Fire tree, Candle-berry myrtle *Myrica faya*

Fringed waterlily *Nymphoides peltata*

Great reedmace *Typha latifolia*

Green cestrum *Cestrum parqui*

Grey willow *Salix cinerea*
Heather *Calluna vulgaris*
Hornwort *Ceratophyllum demersum*
Horse nettle *Solanum carolinense*
Horsetail *Equisetum arvense*
Hydrilla *Hydrillla verticillata*
Japanese honeysuckle *Lonicera japonica*
Johnson grass *Sorghum halepense*
Kahili ginger *Hedychium gardnerianum*
Lantana *Lantana camara var. aculeata*
Lodgepole pine *Pinus contorta*
Madeira vine; Mignonette vine *Anredera cordifolia*
Manchurian wild rice *Zizania latifolia*
Mexican daisy *Erigeron karvinskianus*
Mexican feather grass *Nassella tenuissima*
(Fine-stemmed needle grass)
Mile-a-minute *Dipogon lignosus*
Monkey apple *Acmena smithii*
Moth plant *Araujia sericifera*
Mysore thorn *Caesalpinia decapetala*
Northern banana passionfruit; *Passiflora mixta*
(Banana passionfruit)
Old man's beard *Clematis vitalba*
Oxygen weed *Lagarosiphon major*
Pampas *Cortaderia selloana*
Parrot’s feather *Myriophyllum aquaticum*
Phragmites *Phragmites australis*
Plectranthus *Plectranthus ciliatus*
Primrose willow *Ludwigia peploides*
Purple loosestrife *Lythrum salicaria*
Purple pampas *Cortaderia jubata*
Pyp grass *Ehrharta villosa*
Rough horsetail *Equisetum hyemale*
Royal fern *Osmunda regalis*
Sagittaria; Delta Arrowhead *Sagittaria platyphylla*
Salvinia, kariba weed *Salvinia molesta*
Sawtooth *Najas marina*
Selaginella *Selaginella kraussiana*
Senegal tea *Gymnocoronis spilanthoides*
Small balloon vine *Cardiospermum halicacabum*

Smilax; Bridal veil creeper *Asparagus asparagoides*

Southern cattail *Typha domingensis*

Southern naiad *Najas guadalupensis*

Tree privet *Ligustrum lucidum*

Wandering Jew; *Tradescantia Tradescantia fluminensis*

Water chestnut *Trapa natans*

Water hyacinth *Eichhornia crassipes*

Water lettuce *Pistia stratiotes*

Water poppy *Hydrocleys nymphoides*

Water primrose *Ludwigia peruviana*

Water soldier *Stratiotes aloides*

White bryony *Bryonia dioica*

White-edged nightshade *Solanum marginatum*

Yellow flag iris *Iris pseudacorus*

Yellow ginger *Hedychium flavescens*

Yellow waterlily *Nuphar lutea*

Appendix C – Animal Pests Within Whangarei District.

Name	Diet	Impact
Possum *Trichosurus vulpecula*	Leaves, buds, flowers, fruit. Bark. Fungi. Invertebrates. Native birds and their eggs, Land snails. Scavenge carcasses i.e. pigs, deer.	Selective browsing of preferred plant species. Gradual change in forest composition. Canopy defoliation and mortality. Competition with native birds for seasonal resources e.g. fruit, and nest sites (hole nesting birds). Density 10-12/ha in podocarp-broadleaf forest
Deer Red, Wapiti (and hybrids) *Cervus elaphus* Sika *Cervus nippon* Fallow *Dama dama*	Foliage of sub-canopy trees, shrubs, woody plants, ferns, grasses and herbs. Bark, seedlings and saplings. Manuka/kanuka shrubland. Litter fall. Fungi. Lichen.	Can cause major modification to the composition of indigenous vegetation. Selective removal of preferred plant species, preventing their regeneration. Reduction in the density and diversity of the understory (replacement with less palatable species). Increased erosion of water catchments, threatening downstream values. No feral populations in the district. Continuous response to deer which have escaped from farms by Northland Deer Eradication Team.
Goat *Capra hircus*	Wide range of plants i.e. broad leaf, woody, ferns, grass, scrub and forest. Leaves, seedlings, saplings	Changes the composition and biomass of native vegetation in the under storey tiers of forest habitats. Inhibit regeneration on steep naturally eroding slopes. Can exploit places deer cannot reach
Pig Sus scrofa	Supplejack, bracken, grasses. Fruit, roots. Fungi. Amphipods, centipedes, beetles, earthworms, native land snails, frogs, lizards, freshwater eel, ground nesting birds and their eggs.	Damage soil and leaf litter habitat by rooting. Remove litter invertebrates. Could affect long-term ecosystem processes i.e. nutrient cycling, and plant species composition or distribution/abundance. Decline in the numbers of native land snails. Damage kiwi feeding areas.
Mustelids **Stoat** *Mustela erminea*	Birds (eggs, chicks, adults), insects (weta), lizards, fish, crayfish.	Predator Main predator of juvenile kiwi. Shorebirds, and burrowing seabirds and those which nest in holes are most vulnerable. A change in abundance of their normal prey (rats) can be expected to cause a rapid shift to alternative resources.
Ferret *Mustela furo*	Birds (eggs, chicks, adults), lizards, crustaceans, frogs, eels, invertebrates (weta, beetles, spiders),	Predator. Kill adult kiwi. Vulnerable bird species are those which nest on the ground and in burrows i.e. seabirds, shorebirds. Kauri snail at risk. Habitat includes swamps, river valleys, and margins

		of waterways.
Weasel *Mustela nivalis vulgaris*	Small prey. Birds (eggs and chicks), lizards, insects (weta, beetles)	Predator Similar impact to stoats
Dog *Canis familiaris*	Birds i.e. kiwi, penguin, waterfowl, seabirds. Lizards, frogs, insects.	Predator Main predator of adult kiwi Uncontrolled pets, working dogs, or hunting dogs.
Cat *Felis catus*	Bats, birds, lizards, frogs, fish, crustaceans, invertebrates (weta, cicada, spiders)	Predator Feral cats, uncontrolled pets.
Rats Ship *Rattus rattus* Norway *Rattus norvegicus* Kiore *Rattus exulans*	Insects i.e. moths, butterflies, weta, beetles, stick insects, centipedes, spiders, earthworms, ants, beetles, weevils, cicadas, land snails. Crustaceans, molluscs. Lizards, birds (eggs, and chicks). Fruit, flowers, leaves, seeds, seedlings,	Predator; cause local extinctions, and the permanent reduction of native species Competition for food i.e. with lizards. Reduced recruitment of plant species which affects forest composition. Species which live, roost or nest on the ground are especially vulnerable. Ship rats are "probably the most widespread and pervasive mammal predators in non-beech forest on the NZ mainland". Kiore found only on offshore islands.
Mice *Mus musculus domesticus*	Small prey. Birds (eggs, chicks), lizards. Small invertebrates (caterpillars, spiders, weta, worms, centipedes, amphipods). Plant material (leaves, seeds), fungal spores.	Predator Reach higher populations in areas with dense ground cover. Population eruptions after heavy seed falls. Support predator populations.
Hedgehog *Erinaceus europaeus occidentalis*	Invertebrates i.e. beetles, slugs, snails, weta, grasshoppers, worms, earwigs. Mice, lizards, frogs, eggs and chicks of ground nesting birds. Scavenge carion. Plant material (minor).	Predator of indigenous species. Compete with native species which feed on invertebrates i.e. kiwi. Compete with native species for nest sites. Abundant through lowland districts, especially near the coast.
European rabbit *Oryctolagus cuniculus cuniculus* **Brown hare** *Lepus europaeus occidentalis*	Browsers of grasslands Grasses, shrubs, tussock in coastal dunes, clearings in scrub/forest, marshes.	Reduce plant growth and inhibit regeneration. Effects inter-linked with other herbivores and burning. Sustain populations of predators i.e. feral cats, ferrets. Are at low to medium density in Northland
Insects		

Argentine ants *Linepithema humile* Other exotic ant species , Snails, Slugs, Beetles, Mites, Aphids	Sweet items. Protein (meat, eggs, fish). Dead insects. Small animals.	Invasive aggressive species. Can form super colonies of immense size. Threaten native birds, lizards and insects by either attacking them or by competing for food. Browse plants
Domestic stock *i.e. sheep, cows, goats*		Browse and trample native species. Spread weeds. Disturb ground.
Pest fish i.e. Catfish, Gambusia, Koi carp, Rudd	Native plants. Insects. Fish eggs. Attack and kill Koura, and small native fish,	Competition for food and habitat, stir up sediment, habitat disturbance and loss.

Appendix D – Threatened Animal Species In Whangarei District.

Birds

Category	Species	Status	Location
Nationally Critical	NZ fairy tern Tara iti	Resident	Waipu, Ruakaka, Whangarei harbour shellbanks
	White heron Kotuku	Visitor	Waipu River, Ruakaka River. Harbours, estuaries, wetlands, wet pasture
	NZ shore plover	Vagrant	2 records at Waipu
	Grey duck Parera	Resident	Wetlands, lakes, rivers
Nationally Endangered	Australasian bittern Matuku	Resident	Waipu, Ruakaka, Whangarei harbour, Freshwater and estuarine wetlands
	Red-tailed tropic bird Amokura	Vagrant	2 records at Bream Bay. Habitat is tropical seas. Rare vagrant to northern NZ mainland.
Nationally Vulnerable	Wrybill Ngutuparore	Visitor	Ngunguru Sandspit, Whangarei harbour. Beaches, mudflats, estuaries
	Northern NZ dotterel Tuturiwhatu pukenui	Resident	Ruakaka, Waipu, Whangarei harbour, Ngunguru Sandspit, Mimiwhangata, Whangamumu. Beaches, estuaries, rivermouths
	Reef heron Matuku moana	Resident	Whangarei harbour, Taiharuru estuary, Ruakaka, Waipu, Hen and Chickens Islands, islands off Whananaki-Mimiwhangata. Intertidal mudflats, mangrove inlets, rocky shores, wave platforms.
	Caspian tern Tara nui	Resident	Ruakaka, Waipu, Whangarei harbour.
	NI Kaka	Islands	Hen and Chickens Islands, Poor Knights Islands, appearing on mainland i.e. Brynderwyn Hills, Bream Tail
	NI weka	Unknown	Historical records from Brynderwyn Hills and Uretiti
	NI brown kiwi	Resident	Bream Head, Matakohe-Limestone Island, scrub, forest, rough farmland
	Banded dotterel Pohowera	Visitor	Whangarei harbour, Ruakaka, Bream Bay, Waipu, Whananaki, Ngunguru. Sandy beaches, shell banks, estuaries.
	Red billed gull Tarapunga	Resident	Ruakaka, Waipu, Whangarei harbour. Throughout the district. Beaches, estuaries.
	NZ dabchick Weweia	Resident	Lakes, ponds
	Pied shag Karuhiruhi	Resident	Coastal, lagoons, lakes, estuary.
Declining	NZ pipit Pihoihoi	Resident	Open country. Rough grassland, sand dunes, rocky terrain.
	NZ pied oystercatcher Torea	Visitor	Ruakaka, Waipu, Whangarei harbour, Ngunguru Sandspit, Mimiwhangata, Whangamumu. Beaches, estuaries, rivermouths
	NI fernbird Matata	Resident	Matakohe-Limestone Island. Takahiwai-Mangapai, Maungatapere. Wetlands, saltmarsh.
	Northern blue penguin Korora	Resident	Poor Knights and Hen and Chickens Islands, Bream Islands, Whangarei harbour, Whangaruru, Mimiwhangata, Ngunguru. East coast and islets. Rocky coasts, islands.
	Pied stilt Poaka	Resident	River bed, estuary, lake, swamp.
	White-fronted tern Tara	Resident	Ruakaka, Waipu. Throughout the district. Beaches, estuaries, sandspits.
	Flesh-footed shearwater	Islands	Hen and Chickens Islands
Recovering	Brown teal Pateke	Resident	Mimiwhangata, Whananaki, Russell peninsula to Pataua estuary.
	Little spotted kiwi	Islands	Hen Island
	Variable oystercatcher	Resident	Ruakaka, Waipu, Whangarei harbour, Ngunguru Sandspit, Mimiwhangata, Whangamumu. Beaches, estuaries, rivermouths
	NI saddleback Tieke	Islands	Forest and scrub on Hen and Chickens Islands

	Pycrofts petrel	Islands	Hen and Chickens Islands, Poor Knights Islands
Relict	Red-crowned parakeet Kakariki	Islands	Hen and Chickens Islands, Poor Knights Islands
	Spotless crake Puweto	Resident	Ruakaka, Waipu, Freshwater wetlands.
	Marsh crake Koitareke	Visitor	Whangarei harbour. Wetlands – freshwater, estuarine.
Naturally Uncommon	Poor Knights bellbird Korimako	Islands	Poor Knights Islands. Appearing on mainland in Bream Head area.
	Brown skua Hakoakoa	Visitor	Whangarei Harbour. Often seen on NZ mainland in winter.
	Long-tailed cuckoo Koekoea	Visitor	Brynderwyn Hills, Forests.
	Banded rail Moho-pereru	Resident	Mimiwhangata, Whangarei harbour, Takahiwai, Ruakaka, Waipu. Saltmarsh, mangroves, wetlands.
	Royal spoonbill Kotuku-ngutupapa	Visitor	Estuary, mudflats, lakes
	Black shag Kawau	Resident	Ruakaka, Waipu. Throughout the district. Rivers, streams, lakes, estuaries, harbours.
	Little black shag	Visitor	Waipu, Whangarei Harbour. Lakes, estuaries, harbours.
	Little shag Kawaupaka	Resident	Lakes, rivers, streams, estuaries, harbours
	Buller's shearwater	Islands	Poor Knights Islands

In addition a number of migrant wading birds visit harbours, sandspits, river estuaries within Whangarei District each year. These include: turnstone, knot, sharp-tailed sandpiper, curlew sandpiper, red-necked stint, white-winged black tern, Eastern bar-tailed godwit, Far eastern curlew, Asiatric whimbrel, Pacific golden plover, little tern, cattle egret.

Mammals

Category	Species	Status	Location
Nationally Vulnerable	Long-tailed bats Pekapeka	Resident	Three Mile Bush Rd, Pukenui, Rehuotane, Kiripaka-Glenbervie, Hurupaki Cone, Maunu,

Reptiles and Amphibians

Category	Species	Status	Location
Declining	Pacific gecko	Islands Resident	Hen and Chickens Islands, Bream Island, Russell forest, sparse on mainland
	Poor Knights gecko *Hoplodactylus* 'Poor Knights'	Islands	Poor Knights Islands
	Auckland green gecko	Resident	Whangarei Falls/Whareora, Hurupaki Cone, Parahaki, Whangaruru North Head, Whananaki. Bush, scrub (manuka/kanuka),
	Ornate skink *Cyclodina ornata*	Islands Resident	Hen and Chickens Islands, Poor Knights Islands, sparse on mainland
Naturally Uncommon	Hochstetter's frog	Resident	Brynderwyn Hills, Mareretu Forest, Waipu gorge and Waipu caves areas.
	Duvaucell's gecko	Islands	Hen and Chickens Islands, Poor Knights Islands, Bream Islands
	Moko skink	Islands	Hen and Chickens Islands, Poor Knights Islands, Bream Islands
	Northern tuatara	Islands	Hen and Chickens & Poor Knights Islands

	Poor Knights marbelled skink *Cyclodina oliveri* 'Poor Knights'	Islands	Poor Knights Islands
	Poor Knights skink *Cyclodina* 'Poor Knights'	Islands	Poor Knights Islands
	McGregor's skink *Cyclodina macgregori*	Islands	Poor Knights Islands, Hen and Chickens Islands, Sail Rock, Bream Island
	Mokohinau skink Cyclodina 'Mokohinau Island'	Islands	Translocated to Hen and Chickens Islands

Freshwater Fish

Category	Species	Status	Location
Declining	Long finned eel	Resident	Rivers, streams, lakes
	Black mudfish	Resident	Hikurangi swamp area, Otakairangi Swamp, Horahora/Ngunguru estuaries
	Koura	Resident	Rivers, streams, lakes
	Freshwater mussel	Resident	Rivers, streams, lakes
Naturally Uncommon	Short-jaw kokopu	Resident	Tangihua Range rivers
	Freshwater crab *Amarinus lacustris*	Resident	Mangere Stream, Wairua River
	Lamprey	Possible	One record Russell Forest

Invertebrates

Category	Species	Status	Location
Nationally Critical	Snail *Phrixgnathus transitans*	Resident	Known from 2 specimens at Parua Bay in the late 19th Century.
	Snail Punctidae sp. 6	Resident	Whangarei Heads, Whananaki, Matapouri. Coastal dunefields.
Nationally Endangered	Flax snail Pupuharakeke *Placostylus* (Maoristylus) *hongii*	Resident	Whangarei Heads. Whangaruru/North Head. Hen and Chickens Islands. Poor Knights Islands. Coastal shrubland and broadleaved forest.
	Snail Punctidae sp. 12	Resident	Waro Limestone Scenic Reserve
	Snail Punctidae sp. 20	Resident	Waro Limestone Reserve, Kamo Limestone, Abbey Cavesm Coronation Reserve
	Snail Punctidae sp. 64	Resident	Waro Limestone Reserve, Abbey Caves, Waipu Caves. Native forest on limestone karst.
Nationally Vulnerable	Snail *Amborhytida tarangensis*	Islands	Hen and Chickens Islands.
Declining	Snail *Amborhytida dunniae*	Resident	Ngunguru. Horahora bush, Glenbervie forest, Abbey Caves, Waikaraka stream, Whanui bush. Brynderwns. Sporadic distribution. Native forest and shrubland.
	Kauri snail Pupurangi *Paryphanta busbyi*	Resident Islands	South to Brynderwyns. Hen and Chickens Islands. Pukenui. Kaiikanui forest. Native shrubland and forest. Pine plantations. Neighbouring rank exotic grassland.
	Black katipo *spider Latrodectus atritus*	Resident	Mimiwhangata, Ngunguru sandspit. Pingao/spinifex dunelands. Absent from modifiied areas.
	Snail *Succinea archeyi*	Resident	Mimiwhangata, Ngunguru Sandspit, Whananaki Sandspit, Horahora dunes. Sand fields, dune fields.
	Forest ringlet butterfly *Dodonidia helmsii*	Resident	Parahaki. Russell Forest
Naturally Uncommon	Northland tusked weta	Resident	Whananaki

	Darkling beetle *Mimopeus opaculus*	Islands	Hen and Chickens Islands, Poor Knights Islands
	Turbott's weevil *Anagotus turbotti*	Islands	Hen and Chickens Islands, Poor Knights Islands
	Long-horn beetle *Nesoptychias simpliceps*	Resident	Whangarei to East Cape
	Long-horn beetle *Gastrosaurus* 'Poor Knights'	Islands	Poor Knights Islands
	Long-horn beetle *Navomorpha neglecta*	Islands	Poor Knights Islands
	Beetle *Tangarona pensus*	Resident	Whangarei Harbour area
	Stag beetle *Paralissotes mangonuiensis*	Resident	Russell Forest
	Robber fly *Neoitamus 'tawahi'*	Islands	Poor Knights Islands
	Assassin bug *Empicoris seorsus*	Islands	Poor Knights Islands
	Poor Knights giant weta *Deinacrida fallai*	Islands	Poor Knights Islands
	Poor Knights cave weta *Gymnoplectron giganteum*	Islands	Poor Knights Islands
	Tuatara tick *Aponomma sphenodonti*	Islands	Hen and Chickens Islands. Poor Knights Islands
	Peripatus Ngaokeoke *Ooperipatellus nanus*	Resident	Hen and Chickens Islands. Vinegar Hill bush
	Karo weevil *Hadramphus pittospori*	Islands	Poor Knights Islands
	Paua slug *Schizoglossa wothyae*	Resident	Bream Head, Glenbervie forest, Helena Bay.
	Ground beetle *Mecodema* 'Poor Knights'	Islands	Poor Knights Islands
	Weevil *Allanalcis* 'Poor Knights'	Islands	Poor Knights Islands
	Weevil *Anagotus* 'Poor Knights'	Islands	Poor Knights Islands
	Weevil *Crisius* 'Poor Knights'	Islands	Poor Knights Islands
	Weevil *Ectopis* 'Poor Knights'	Islands	Poor Knights Islands
	Weevil *Exomesites* 'Poor Knights'	Islands	Poor Knights Islands
	Weevil *Hadracalles fuliginosus*	Islands	Poor Knights Islands
	Weevil *Phrynixus* 'Poor Knights'	Islands	Poor Knights Islands
	Weevil *Praolepra* 'Poor Knights'	Islands	Poor Knights Islands
	Weevil *Scelodolichus* 'Poor Knights'	Islands	Poor Knights Islands
	Weevil *Tychanopais* 'Poor Knights'	Islands	Poor Knights Islands
	Stag beetle	Islands	Poor Knights Islands. Russell Forest.

	Paralissotes mangonuiensis	Resident	
	Chafer beetle *Odontria* 'Poor Knights'	Islands	Poor Knights Islands
	Darkling beetle *Mimopeus* 'Poor Knights'	Islands	Poor Knights Islands
	Snail *Climocella* 'Poor Knights'	Islands	Poor Knights Islands
	Snail Charopidae sp. 24	Islands	Poor Knights Islands
	Snail *Amborhytida pycrofti*	Islands	Poor Knights Islands
	Snail *Amborhytida* 'Motukokako'	Islands	Cape Brett and Motukokao (Piercy) Island
	Snail *Liarea bicarinata*	Resident	Sporadic distribution between Motatau and Whangarei. Native broadleaved and conifer-broadleaved forest.
	Snail *Liarea egea* "Poor Knights"	Islands	Poor Knights Islands
	Snail Punctidae sp. 3	Islands	Poor Knights Islands
	Snail Punctidae sp. 15	Resident	Whangamumu harbour. Coastal broadleaved forest and shrubland.
	Snail Punctidae sp. 25	Islands	Poor Knights Islands
	Snail Punctidae sp. 28	Resident	Whangamumu to Glenbervie
	Snail Punctidae sp. 42	Resident	Pakotai Scenic Reserve. Conifer broadleaved forest.
	Snail Punctidae sp. 38	Resident	Pakotai Scenic Reserve. Mangakahia. Conifer broad-leaved forest. Conifer broad-leaved forest.
	Snail Punctidae sp. 39	Resident	Tangihua. Waipu Gorge. Conifer broad-leaved forest.
	Snail Punctidae sp. 40	Resident	Tangihua Range. Conifer broadleaved forest.
	Snail Charopidae sp. 167	Islands	Poor Knights Islands
	Snail *Allodiscus cooperi*	Islands	Poor Knights Islands
	Snail *Aureopunctum turbotti*	Islands	Poor Knights Islands
	Snail *Hyalolaoma elevata*	Resident	Brynderwyn
	Snail *Kokikora mimiwhangata*	Resident	Coastal sites between Bay of Islands and Whananaki. Coastal and conifer-broadleaved forest.
	Snail *Laoma minuta* "Poor Knights"	Islands	Poor Knights Islands
	Snail *Phrixgnathus paralaomiformis*	Islands	Poor Knights Islands, islets off Mimiwhangata
	Schizoglossa worthyae	Resident	Whangarei Heads. Glenbervie Forest, Mareretu forest, Waipu gorge.

Appendix E – Threatened Plant Species In Whangarei District.

Category	Species	Location
Nationally Critical	Kakabeak *Clianthus puniceus*	Historical record Maungatapere
	Swamp koromiko *Hebe aff. bishopiana*	Hikurangi swamp
	Dwarf greenhood *Linguella puberula*	Historical record Maungatapere Coastal-lowland. Clay banks beneath light scrub, gumland.
	Northland horopito *Pseudowintera insperata*	Bream Head, Mt Manaia Coastal-lowland. Alluvial forest, exposed ridge tops.
	Moss *Scorpiurium cucullatum*	
	Mawhai *Sicyos australis*	Hen and Chickens Islands, Poor Knights Islands
	Isoetes aff. kirkii	Wairua Falls
	Native hibiscus / Puarangi *Hibiscus richardsonii*	Kamo, Tikipunga. Coastal. Disturbed habitat. Scrub and forest.
Nationally Endangered	Poor Knights spleenwort *Asplenium pauperequitum*	Poor Knights Islands. Rock outcrops
	Giant flowered broom *Carmichaelia williamsii*	Poor Knights Islands. Coastal. Open forest, scrub, cliff faces, talus slopes.
	Juncus holoschoenus var. holoschoenus	Hikurangi flood plain. Coastal, lowland –subalpine. Wetlands
	Cooks scurvy grass *Lepidium oleraceum*	Coastal. Associated with seabird sites. Rock stacks, islets, headlands.
	Stalked adder's tongue fern *Ophioglossum petiolatum*	Historical record. Coastal-lowland. Wetlands, streams, herbfields damp hollows in podocarp forest, lagoons.
	Phylloglossum drummondii	Historical record. Coastal-lowland. Recently burned ground. Gumland scrub.
	Heart leaved kohuhu *Pittosporum obcordatum*	Hikurangi swamp. Lowland alluvial forest.
	Tauhinu *Pomaderris phylicifolia*	Coastal. Nutrient poor, open sites.
	NZ watercress / Matangaoa *Rorippa divaricata*	Hikurangi Swamp, Poor Knights Islands, Hen and Chickens Islands. Historical record Wairua Falls. Recently disturbed ground i.e. slips, clearings, tracks,

		waterway margins
	Fireweed *Senecio scaberulus*	Tutukaka-Whananaki, Wairua Falls. Coastal scrub, forest margins and clearings. Shaded sites
	Royal fern *Todea barbara*	Poor Knights Islands. Coastal-lowland. Gumland scrub, coastal shrublands, stream side margins.
Nationally Vulnerable	Swamp leek orchid *Prasophyllum hectori*	Historic record. Coastal-subalpine. Wetlands, slow flowing streams.
Declining	Kirk's daisy / Kohurangi *Brachyglottis kirkii var. kirkii*	Matapouri. Epiphyte. Lowland-lower montane forest.
	NZ carrot *Daucus glochidiatus*	Coastal, lowland-montane. Open forest. Cliff faces, rock outcrops, grassland.
	Swamp blueberry *Dianella haematica*	Coastal-lowland. Wetlands.
	Doodia squarrosa	Waipu Caves. Coastal and lowland. Alluvial forest, river banks.
	Shore spurge *Euphorbia glauca*	Coastal cliffs, banks, talus slopes, sand dunes, rocky lake shore scarps
	Manuka-Rauriki *Kunzea ericoides var. linearis*	Bream Bay. Coastal shrublands, cliff faces, sand, sand podzols, sandy peats.
	King fern *Marattia salicina*	Pukenui, Matapouri , Mimiwhangata, Whananaki, Helena Bay, Russell Forest. Lowland. Karst habitats, dark stream sides.
	Pimelea tomentosa	Historical record Mangere Falls. Coastal cliffs, shrubland
	Kirk's kohuhu *Pittosporum kirkii*	Epiphyte. Coastal-montane forest.
	Jersey fern *Anogramma leptophylla*	Clay banks, rock faces, alluvial banks
	Sand tussock *Austrofestuca littoralis*	Mimiwhangata, Matapouri. Coastal dunes, sandy and rocky places near the shore.
	Koru *Colensoa physaloides*	Poor Knights Islands, Hen and Chickens Islands, mainland. Coastal and lowland forest, stream sides, damp sites.
	Pingao *Desmoschoenus spiralis*	Whananaki, Pataua, Bream

		Bay. Coastal sand dune systems
	Gratiola concinna	Muddy hollows in forest clearings, margins streams, lakes, rivers, ponds.
	Willow-leaved maire *Mida salicifolia*	Bream Head, Brynderwyn hills, Mt Tiger. Coastal-lowland forest.
	Stout water milfoil *Myriophyllum robustum*	Historical record. Shallow peaty lakes, slow flowing streams, dune ponds, flooded ground in forest.
	Native paspalum *Paspalum orbiculare*	Coastal-lowland. Seasonal wetlands, lake margins, gumland scrub.
	Sand daphne *Pimelea arenaria*	Pataua, Ruakaka. Landward side of fore dunes
	Raukaua *Raukaua edgerleyi*	Russell forest. Lowland-upper montane cloud forest.
	Schoenus carsei	Maungatapere (historical). Coastal, lowland-montane, wetlands.
	Kowhai *Sophora fulvida*	Bream Head, Mt Manaia. Open or disturbed sites. On rock, amongt mixed podocarp-hardwood forest.
	Marsh fern *Thelypteris confluens*	Russell forest. Coastal-lowland. Wetlands.
	White mistletoe *Tupeia antarctica*	Poor Knights Islands. Parasitic. Forest or scrub.
Naturally Uncommon	*Adelopetalum tuberculatum*	Epiphyte. Lowland. Coastal.
	Helmet orchid *Anzybas rotundifolius*	Marunui. Open shaded sites over seasonally water logged soils. Under kanuka and regenerating kauri.
	Baumea complanata	Historical record Maungatapere and Wairua River. Coastal-lowland. Open habitats, estuaries, wetlands, gumland scrub, lake and river margins.
	Blechnum norfolkianum	Poor Knights Islands. Coastal. Associated with seabird sites. Shaded sites.
	Brachyglottis myrianthos	Kaiikanui, Whananaki, Brynderwyns
	Small-flowered white bindweed *Calystegia marginata*	Russell forest, Waikare Inlet, Hukerenui, Mimiwhangata. Historical record

		Maungatapere. Coastal-lowland. Open shrubland, rough pasture, coastal headlands, road sides, railway embankments.
	Celmisia adamsii var. ruglosula	Whangarei harbour, Pataua,
	Coastal tussock *Chionochloa bromoides*	Tutukaka coast, Parua Bay, Bream Tail. Coastal. Cliff faces, rock stacks, petrel scrub.
	Coprosma neglecta	Bream Head, Mt Manaia
	Three Kings cabbage tree *Cordyline obtecta*	Poor Knights Islands
	Crassula ruamahanga	Whatatiri. Sea level to lowland. Damp open habitat.
	Mokimoki *Doodia mollis*	Waipu Gorge, Waipu Caves, Bream Tail. Coastal-lowland forest, river margins, damp sites, deep fertile soil.
	Creeping fuchsia *Fuchsia procumbens*	Bream Head, Matapouri. Coastal. Beaches, cliff faces, scrub, grassland, saltmarsh
	Monoao *Halocarpus kirkii*	Russell forest, Matapouri, Waipu Gorge. Associated with kauri forest.
	Northland River koromiko *Hebe acutiflora*	Wairua riverbank
	Poor Knights houhere *Hoheria equitum*	Poor Knights Islands, Coastal forest, offshore islands.
	Giant hypolepis *Hypolepis dicksonioides*	Poor Knights Islands. Coastal-lowland. Geothermal habitat.
	Dwarf mistletoe *Korthalsella salicornioides*	Manganui catchment. Parasitic. Coastal-upper montane. Forest and scrublands.
	Kawaka *Libocedrus plumosa*	Mareretu forest, Waipu gorge, Brynderwyn hills. Coastal-lowland mixed broadleaf/hardwood forest. Often associated with kauri.
	Puka *Meryta sinclairii*	Hen and Chickens Islands. Coastal forest, grassland, scrub.
	Microlaena carsei	Ngunguru, Papakauri Reserve, Pipiwai. Kauri dominated forest. Damp shaded hollows, river margins.

	Matthew's forget-me-not *Myosotis matthewsii*	Mt Manaia. Coastal-lowland. Damp ground
	Coastal matipo *Myrsine aquilonia*	Poor Knights Islands, Whananaki, Tutukaka.
	Orchid *Petalochilus alatus*	Coastal-lowland. Gulamd scrub, clay pans rocky ridges, margins peat bogs
	Pimelea (b) (AK 165780; Mt Manaia)	Bream Head
	Parapara *Pisonia brunoniana*	Bream Tail, Hen and Chickens Islands. Coastal forest.
	Pittosporum pimeleoides subsp.pimeleoides	Russell forest. Associated with kauri forest. Shrublands, gumland scrub
	Pittosporum virgatum	Associated with kauri forest.
	Pomaderris paniculosa subsp. novae-zelandiae	Mt Manaia, Bream Head, Whangarei Harbour. Open, rocky ground, cliff faces, rock pillars.
	Koheriki *Scandia rosifolia*	Bream Head. Coastal-subalpine. Cliff faces, clay banks, amongst boulders.
	Fan fern *Schizaea dichotoma*	Kaiikanui forest. Coastal areas, offshore islands. Often associated with lowland kauri forest.
	Senecio marotiri	Hen and Chickens Islands. Coastal
	NZ chickweed *Stellaria aff. parviflora*	Poor Knights Islands
	Large-leaved milk tree / Turepo *Streblus banksii*	Bream Head, Hen and Chickens Islands. Coastal and lowland forests, deep fertile soils.
	NZ spinach *Tetragonia tetragonioides*	Bream Tail. Coastal strand zone. Beaches, cliff faces, rock ledges.
	Poor Knights Lily *Xeronema callistemon f. bracteosa*	Poor Knights Islands. Rhyolite sea cliffs and rock outcrops.
	Poor Knights Lily *Xeronema callistemon f. callistemon*	Poor Knights Islands. Hen and Chickens Islands. Rhyolite sea cliffs and rock outcrops.

Appendix F – Regionally Significant Plant And Animal Species In Whangarei District.

Regionally Significant Animal Species

- Birds: Kukupa, pied tomtit, bellbird, yellow crowned parakeet (Kakariki), New Zealand shoveler, New Zealand scaup, Australasian little grebe, grey-faced petrel, shining cuckoo, Australasian gannet.
- Reptiles and amphibians: forest gecko
- Freshwater fish: giant bully, banded kokopu, Koaro, blue gill bully.
- Invertebrates: data unavailable.

Regionally Significant Plant Species

Species name	**Notes**
Adiantum aethiopicum	Occasional distribution
Alseuosmia banksii var. linariifolia	Almost endemic to Northland
Alternanthera denticulata	Hikurangi Swamp
Anaphalioides trinervis (incl. A. keriense)	Range restricted - to river margins. Manganui River
Anzybas rotundifolius (=Corybas)	Restricted to gumlands and shrublands
Apium "white denticles"	Possibly more common
Apium prostratum var. filiforme	Coastal. Poor Knights Islands
Arthropodium bifurcatum	Northland endemic - Poor Knights Islands, Hen and Chickens Islands, Matapouri, Tutukaka coast
Ascarina lucida var. lucida	Rare. Higher altitudes. Hairlike stipules distinguish it from pukatea
Asplenium flabellifolium	Waro. Over collected
Asplenium gracillimum	
Asplenium hookerianum	Mt Manaia
Asplenium obtusatum subsp. northlandicum	Islands. Over collected
Astelia fragrans	
Astelia nervosa	High altitudes. Bronze undersides to leaf
Australina pusilla subsp. pusilla	Bream Head
Beilschmiedia tawa (Bream Head form) Tawaroa	Coastal
Blechnum fluviatile	Mangakahia. Restricted to high altitudes
Blechnum norfolkianum	Poor Knights Islands
Blechnum procerum	Bream Head/Mt Manaia. Wet forests
Blechnum triangularifolium "Green bay"	
Blechnum vulcanicum	Very rare
Bolboschoenus medianus	Whangarei Harbour. Sand/mudflat margin
Botrychium biforme	Poor Knights Islands. Rarest of the two up here
Brachyglottis kirkii var. angustior	Found on ground, narrow-leaved, flowers in Autumn
Bromus arenarius	Flowers Aug-Sept
Callitriche petriei subsp. petriei	Rare and hardly recognised
Calystegia tuguriorum	Found in disturbed habitat
Carex "raotest"/raoulii	Sand dune carex
Carex forsteri	
Carex gaudichaudiana	
Carex maorica	Probably widespread but uncommon
Carex subdola	
Carex testacea ss	
Centipeda minima var. Minima	

Cheilanthes sieberi	
Cheilanthes distans	
Chenopodium ambiguum	Data deficient. Saltmarsh
Chionochloa conspicua subsp. cunninghamii	Large forests
Clematis foetida	
Collospermum microspermum	Mangakahia. Found in wet and high altitudes.
Coprosma acerosa	Bream Bay
Coprosma crassifolia	Pipiwai. Range restricted
Coprosma parviflora	Widespread more or less endemic to Northland. Branches lie on a flat plain
Coprosma propinqua var. propinqua	
Coprosma rigida	Habitat declining. Branches usually red-brown, glossy. Branches stiffly at right angles
Coprosma rotundifolia	Hikurangi Swamp. Round, softly hairy leaves
Coprosma tenuicaulis	
Cordyline fruticosa (an exotic)	Whangaruru. Ethnobotanical significance (bought by Maori to NZ)
Corokia cotoneaster	
Corunastylis pumila	
Crassula ruamahanga	
Cyathea cunninghamii	Data deficient - under recognised
Dichelachne inaequiglumis	Poor Knights Islands. Open sites, threatened by weeds
Dichelachne micrantha	
Dichondra brevifolia agg.	
Dicksonia lanata	Tangihua. Very local
Dracophyllum traversii	Higher altitudes. Very wide leaved, red-tinged. Open habitats peaks and bluffs.
Drosera binata	
Drosera spathulata	
Earina aestivalis	Collected a lot. Very similar to *E. autumnalis*
Einadia triandra	Coastal. Islands
Elaeocarpus hookerianus	
Elatine gratioloides	Water margins
Empodisma minus	
Epacris pauciflora var. pauciflora	Habitat under threat. Widespread but nowhere common
Epilobium alsinoides subsp. alsinoides	Data deficient
Epilobium billardiereanum subsp. billardiereanum	Dune slacks
Epilobium hirtigerum	
Epilobium insulare	
Epilobium nerteroides	
Epilobium nummulariifolium	
Epilobium pallidiflorum	Big swamp one, don't see that often
Epilobium pedunculare	
Epilobium pubens	
Euchiton involucratus	
Fuchsia excorticata	This plant is likely declining
Fuchsia perscandens	Pipiwai
Galium trilobum	
Geranium potentilloides	
Geranium retrorsum	
Geranium solanderi	Quite rare. Large petals
Glossostigma diandrum	
Glossostigma elatinoides	
Gonocarpus aggregatus	Gumland

Gonocarpus micranthus	Gumland
Grammitis billardierei	
Grammitis ciliata	Mt Manaia
Grammitis pseudociliata	
Gratiola concinna	Swampy habitats
Griselinia littoralis	Bream Head. High altitudes
Gunnera monoica	
Hebe bollonsi	Islands. Whananaki coast. Few mainland sites. Dark green shiny leaves, compact habit
Hebe diosmifolia	Scattered populations. Spring and Autumn flowering
Hebe ligustrifolia (incl. "Whangarei")	Dark stems, scruffy habit.
Hebe macrocarpa var. latisepala	Found on Bream Head only. Long leaves often red-blotched
Hebe macrocarpa var. macrocarpa	
Hebe parviflora	Found on Bream Head only
Hedycarya arborea "Islands"	Poor Knights Islands
Helichrysum lanceolatum	
Hierochloe redolens	Bream Head
Hoheria angustifolia	Mangonui River. Pipiwai. Riverine habitats
Hydrocotyle pterocarpa	Wetland habitat
Hymenophyllum armstrongii	Tangihua. Undercollected
Hymenophyllum atrovirens	Mature forest. Dark undisturbed streambeds
Hymenophyllum bivalve	
Hymenophyllum cupressiforme	Mature forest
Hymenophyllum lyallii	Mature forest. Small fan-shaped
Hypericum gramineum	
Hypolepis dicksonioides	
Hypolepis lactea	White hairs
Hypolepis rufobarbata	
Ileostylus micranthus	Piano Hill, Tikipunga
Isolepis distigmatosa	
Isopterygium limatum (Moss)	
Ixerba brexioides	Tangihua. Mt Manaia. High altitudes.
Juncus pauciflorus	
Lagenifera lanata	Quite common in places
Lagenifera stipitata	
Lepidosperma filiforme	Could be rare
Leptinella tenella	
Leptostigma setulosa	
Libertia grandiflora	Manaia
Libertia micrantha	Bream Head
Linum monogynum	Declining
Lophomyrtus obcordata	Sand dune forest
Loxsoma cunninghamii	Parahaki. Silver on back of frond. Sporangia hang down.
Luzula picta var. picta	
Lycopodium scariosum	Puhipuhi
Macherina sinclairii	Bream Head
Manoao colensoi	Te Paki
Melicytus novae-zelandiae	Bream Head. Coastal forest, uncommon on mainland, locally common on islands
Metrosideros carminea	Widespread but uncommon. Small leaf often ephiphytic. Sept/Oct flowering
Metrosideros excelsa x M. robusta	
Metrosideros fulgens (yellow flower)	
Metrosideros robusta	Declining

Microlaena polynoda	
Molloybas cryptanthus (=Corybas)	
Myoporum laetum	
Myosotis forsteri	last record 2002 - is it
Myriophyllum pedunculatum	
Myriophyllum triphyllum	
Myrsine salicina	Undercollected
Neomyrtus pedunculata	Hikurangi Swamp
Nertera scapanioides	Hairy wetland *Nertera*.
Nertera villosa	
Nestegis apetala	Bream Head, Bream Tail. Declining due to regeneration failure. Coastal darks leaves, opposite
Nestegis cunninghamii	Hikurangi Swamp
Nestegis montana	Mt Manaia. Range restricted
Nothofagus truncata	Range Restricted
Olearia albida	Grooved stems, wavy leaf margin.
Ophioglossum coriaceum	
Oxalis magellanica (incl. O. lactea)	
Paspalum orbiculare	Declining
Passiflora tetrandra	
Pelargonium inodorum	Gumlands. Declining
Pellaea calidirupium	Sporangia continuous around edge of pinule
Pennantia corymbosa	Mangonui River. Hikurangi Swamp. Locally common
Phormium cookianum	Mt Manaia
Phormium tenax ("gold stripe")	Poor Knights Islands
Phyllocladus toatoa	Puhipuhi, Russell Forest
Plagianthus regius	Hikurangi Swamp
Plantago raoulii	Hairy leaved plantain
Poa imbecilla	Fine poa
Potamogeton ochreatus	
Potamogeton suboblongus	
Pouteria costata	Beam Head. Coastal, dark gloosy leaves, large orange fruit
Prasophyllum colensoi	
Pratia angulata	Creeping herb, white flowers, red fruit
Pseudowintera axillaris	Bream Head. High altitudes
Pseudowintera colorata	High altitudes
Psilotum nudum	Small stalky fern ally. Open shrubland habitats
Pteris comans	
Pterostylis agathicola	
Ranunculus acaulis	
Ranunculus macropus	Hikurangi Swamp hybrid
Ranunculus urvilleanus	Not creeping. Hairy, tufted, robust plant.
Raukaua anomalus	
Rhytidosperma tenue	
Rubus squarrosus	Bream Head. Mostly leafless, prickly, yellow spined scrambler. Dark stems.
Rubus schmidelioides	Hikurangi
Schizaea bifida	Gumland habitats. Similar to *S. fistulosa* but stipe shorter and sometimes forked.
Scleranthus biflorus	
Senecio biserratus	
Senecio quadridentatus	
Sophora microphylla	Hikurangi Swamp
Sparganium subglobosum	Fertile wetland plant. Leafy rush with distinctive spherical

	spikes
Stellaria parviflora	
Suaeda novae-zelandiae	
Syzygium maire	
Tetraria capillaris	
Thelymitra aemula	
Thelymitra colensoi	
Thelymitra ixioides	
Thelymitra tholiformis	
Toronia toru	Mt Manaia, Bream Head.
Trichglochin striata	
Trisetum arduanum	Common on offshore islands
Uncinia aff. uncinata	
Uncinia cf. clavata	
Urtica ferox	Bream Head
Urtica incisa	
*Zoopis nitida (*Liverwort)	
Zostera capricorni	
Zostera muelleri	Declining
Records in red are not confirmed	

Appendix G – Assessment Sheet For Conservation Covenants.

WDC Covenant Assessment Sheet			
Date	**Time**	**Monitored by**	
Weather cond.			
Current landowners name, postal address & phone		**Covenant size** WDC records Actual (estimate)	
		Covenant type WDC QEII Other	**WDC covenant number**
Name of original owner/covenantor	**Physical location & Grid Ref**	**Legal description**	**Property id**
Date of registration	**Access details**		
Physical description of covenant			
Habitat type mature forest regenerating forest shrubland scrubland wetland grassland river/stream/lake riparian individual or small group of trees historical/cultural site Other:			
Habitat description (eg taraire – kohekohe dominated mature forest)			
Indigenous plant species of interest (eg any uncommon or endangered species)			
Pest plants			
Evidence of pest plant control			
Wildlife observations or information (eg known kiwi zone)			
Animal pest observations (eg possum scratching)			
Evidence of animal pest control			
Fencing completely fenced partially fenced not fenced (show fencing on diagram on attached form) Does fencing comply with covenant requirements (yes/no)			

Valuation criteria						
Criteria	**Value**					**Score**
Stock access	1 Full grazing	2 Sign <3mon	3 Sign 3-12mon	4 Sign > 1yo	5 No grazing	
Condition of fencing (if applicable)	1 Does not exclude stock		3 Adequate – in need of repair		5 Full – good condition	
Canopy condition	1 Canopy <50% dieback >50%	2 Open canopy dieback 20-50%	3 50%I – 50%E	4 Dense cover dieback 5-20%	5 Full cover dieback <5%	
Understorey/regeneration condition (plants > 0.5m – below canopy)	1 Bare (0-5%) no palatable spp.	2 Sparse (5-40%) mainly unpalat.	3 40-60% cover mainly unpalat.	4 Thick (60-90%) numerous palat.	5 Dense (>90%) lots palat spp.	
Ground cover condition (plants <0.5m)	1 Bare (0-5%) no palatable spp.	2 Sparse (5-40%) mainly unpalat.	3 40-60% cover mainly unpalat.	4 Thick (60-90%) numerous palat.	5 Dense (>90%) lots palat spp.	
Pest Plants – vine/climbers	1 Extreme >70% of canopy	2 Very common 50–70% canopy	3 Common 10-50% canopy	4 Occasional <10% of canopy	5 None present	
Pest plants – tree/shrub	1 Extreme >70% cover	2 Very common 50–70% cover	3 Common 10-50% cover	4 Occasional <10% cover	5 None present	
Pest plants – ground cover (plants <0.5m)	1 Extreme >70% cover	2 Very common 50–70% cover	3 Common 10-50% cover	4 Occasional <10% cover	5 None present	
Total vegetation Indigenous (I) vs. Exotic (E)	1 95-100% E	2 95%E–25% I	3 50%I – 50%E	4 25%E – 95%I	5 95 - 100% I	
Birds – relative abundance Record total obs. & no. of spp. (in and within 20m of site)	1 Very few 1 – 2 spp.	2 Occasional 3 – 5 spp.	3 Frequent 5 – 8 spp	4 Numerous 8 – 10 spp.	5 Abundant > 10 spp	
Awareness & compliance of landowner	1 Total disagreement		3 Indifferent		5 Totally supportive	
					Total Score	
					Mean score	

Actions Required:

Revised Assessment Sheet for Conservation Covenants

Deed ID		**DP**		**Date**		**Location**			
Origin of covenant *Circle one*		Resource consent		Voluntary		**Year created**			
Pest management plan *Circle one*		Yes		No					
Landowner resident *Circle one*		Yes		No					
Threatened environment		**Major**				**Minor**			
PNA site (if overlap)		**Name**				**Number**			
Habitat type		**Majority**				**Type**			
		Minority				**Type**			
Perimeter fencing *Circle one*		Not required - Stock exclusion clause			Completed		Partial		Absent
		Condition *Circle one*		Sound		In need of maintenance			
Stock excluded *Circle one*		Yes	No	**Type of sign seen** *(if any)* :					
Management									
Pest plants		**Management** *Circle one*		Known		Unknown			
		Within last 2 years *Circle one*		Yes		No			
		Control operation *Circle one*		Ad-hoc		Planned			
Unknown		**Species targeted**							
		Methodology							
		Monitoring result				None			
Animal pest		**Management** *Circle one*		Known		Unknown			
		Within last 2 years *Circle one*		Yes		No			
		Control operation *Circle one*		Ad-hoc		Planned			
Unknown		**Species targeted**	1.		2.		3.		
		Methodology	1.		2.		3.		
		Monitoring result *RTT, RTC, trap catch*					None		
Observations									
No. pest plant species seen			**Species:**						
Evidence of unevenly distributed animal pests (circle, describe)		Goats Sign		Deer Sign		Pigs Sign			
Threatened species observations		Plants							
		Animals							
Comments									
Recommendations	1.								
2.			3.						

Assessor: .....

Appendix H - Funds Available For Community Groups Undertaking Biodiversity Protection.

Organisation	Fund	$ Amount per annum	Time	Priorities
Ministry for the Environment	Sustainable Management Fund	10,000 – 200,000 Total 3.84m Fund 50-80%	Up to 3 years	* Encouraging sustainable households. * Sustainable land and water management. * Supporting sustainable business practices. * Meeting the challenges of climate change.
Department of Conservation	Biodiversity Advice Fund	Up to 60,000 Total 1.1m	Up to 3 years	* Provision of information and advice to land managers to assist with the management of indigenous biodiversity to improve its condition (outside of public conservation lands).
	Biodiversity Condition Fund	Up to 60,000 Total 2.2m	Up to 3 years	* Improve and maintain the condition of areas of indigenous vegetation, species and habitats (outside of public conservation land). * Broaden community effort in the management of indigenous biodiversity, and to complement contributions for its enhancement.
	Community Conservation Fund	5,000 – 40,000 Total 4m from 2008-2010	Up to 2 years	* Restoration on public land to improve and maintain the condition of rare and threatened native areas. * Emphasis on restoration planting, weed control, fencing, advice. * Established community groups working on public land.
	Nga Whenua Rahui	Total 2.1m		* To provide funding for the protection of indigenous ecosystems on Maori land. * Voluntary formal protection of Maori owned indigenous areas via kawenata.
	Matauranga Kura Taiao	Total 2.4m		* To support tangata whenua initiatives in the revival, use and retention of traditional Maori knowledge and practices in biodiversity management. * To promote biodiversity and ensure traditional knowledge and practices of Maori are respected and preserved in the management of our biodiversity and natural resources.
	Nature Heritage Fund	Unknown		* Protection of indigenous ecosystems that represent the full range of natural diversity originally present in the New Zealand landscape by providing incentives for

				voluntary conservation. * Focus on representativeness, sustainability, landscape integrity, amenity and utility. * Purchase of land, covenanting, fencing, management costs.
World Wide Fund for Nature	Habitat Protection Fund	2,000 – 20,000 Total unknown		* Encourage and promote the protection of areas of high conservation significance within the community by local habitat protection groups. * Restoration and conservation of critical habitats and ecosystems. * Re-planting and conservation of traditional indigenous species. * Environmental education and building capacity to enhance awareness and understanding. * The creation of opportunities for employment and community development.
	Environmental Action Fund	Total 50,000		* Schools and community groups to support children to actively learn and participate in environmental education and education for sustainability.
Project Crimson Trust		Unknown. Trees also provided		* Conservation, restoration and research projects involving pohutukawa or rata.
Forest and Bird	JS Watson Conservation Trust	4,000 Total 20,000		* The conservation of flora, fauna and natural features of New Zealand. * The advancement of knowledge by way of research, literary contribution, essays, articles or other efforts. * General education of the public to give them an understanding and love of the earth.
QEII		Total 1.5m		* The Trust's core activity is to secure long-term protection of natural and cultural features on private land, usually by the legal mechanism of an open space covenant. Assistance with fencing costs.
Ducks Unlimited – Waterfowl and Wetlands Trust	Wetland Care NZ	Unknown		* Restore and develop lost wetland areas within New Zealand. * Preservation and conservation of the flora and fauna of our most endangered ecosystem so that vibrant wetlands are our legacy to future generations.
Honda Tree	Honda Tree	Unknown		* Funds the planting of 10 native trees for

Trust	Fund			every new car sold, and individual Honda agents fund a further three trees. * The funded native trees are planted locally in the customers purchase region, in association with Regional Councils.
Fish and Game NZ	NZ Game Bird Habitat Trust	Total approx. 40,000	Annual	* Exists primarily to improve New Zealand game bird habitat, and secondarily to improve the habitat of other wildlife. * Development and enhancement of wetland habitat.
Department of Internal Affairs	Lottery Environment and Heritage Grant	Unknown		* Promotion, protection and conservation of New Zealand's natural, physical and cultural heritage, such as: • native regeneration projects/establishment of native plant nurseries . • captive breeding programmes including animal release to enhance indigenous fauna . • pest and predator eradication programmes .
	The Pacific Development and Conservation Trust	3000,000	1 year	• to encourage and promote the enhancement, protection and conservation of the natural environment of the South Pacific and its natural resources. • to promote the peaceful economic, physical and social development and self-sustainability of the South Pacific and its peoples, ensuring that the use of any natural or historic resource is consistent with its conservation. • to encourage and promote peaceful conservation and development of the cultural heritage of the peoples of the South Pacific. • to encourage and promote peace, understanding and goodwill between the peoples of the South Pacific. The Trust is committed to supporting sustainable development, where communities are engaged and working in partnership with iwi, hapū, local indigenous peoples and communities.

BOC	Where there's water community environmental grants	5,000 Total unknown	1 year	* To help the community understand, maintain, protect and improve their water environment i.e. improve education opportunities for children to learn about their water environment, improve community awareness of the condition and importance of the water environment, and assist schools and the community to participate in real action to maintain, protect and improve their water environment.
Robert C Bruce Trust		5,000 Total unknown	1 year	* Research directly related to forests or afforestation for the public good. * The purchase of plants and seedlings to be planted on public land. * Planting or replanting of forest or native bush on public land. * Equipping a University Department concerned with forestry. * The maintenance of State Forests, including forest fire fighting.
Ron Greenwood Environmental Trust		2,500 Total 300,000	1 year	* To assist with the preservation and protection of the natural environment in NZ. * For community groups.
NZ Ecological Restoration Network	Field Days Fund	Total 10,000	1 year	* Financial support to help members hold field day events which inform or encourage owners of private land to protect, maintain, and restore areas of native bush and improve stream health.
Transpower Community Care Fund	*Replaces Transpower Landcare Trust Grants Programme*	5,000 Total 100,000	1 year	* Enhancing sustainable land management or biodiversity on private rural land.
Northland Regional Council	Environment Fund	30,000 Total 500,000 Fund 50%	Up to 3 years	* Wetland protection and enhancement. * Pest animal and plant control. * Re-vegetation and enhancement with native plants. * Coastal dune enhancement and protection. * Stock exclusion from coastal marine (tidal) area. * Restoration and protection of native habitats
Ministry of Agriculture	Afforestation Grant Scheme	$3.5 million 2011/12	1 year	* To encourage greater levels of greenhouse gas absorption by increasing the area of

and Forestry (via NRC)		$3.5 million 2012/13 $2 million 2013/14		Kyoto-compliant forest. * Establish in areas to help reduce the likely impacts of climate change, reduce erosion, nutrient leaching, and flood peaks. * Government gets the carbon credits for the new forest for the first ten years. * Any tree species which grows higher than 5m. Minimum of a 5ha land area (including multiple areas of 1ha) at least 30m wide. Minimum rate of 500-750 stems per hectare.
Alter-Natives Wholesale Nursery	Native Plant Fund	7,500 native plants	1 year	* Schools in the Whangarei and Kaipara District. * Lots of 100 native plants.

Appendix I - Non-government National Organisations Involved In Biodiversity Protection in New Zealand.

Queen Elizabeth II National Trust ***www.openspace.org.nz***

The QEII National Trust was established in 1977 to help private landowners protect significant natural and cultural features on their land through open space covenants. Features protected include landscapes, forest remnants, wetlands, grasslands, threatened species habitats, and cultural and archaeological sites, many of which are not found on public conservation land, and exist only as fragments on private land. Seventy per cent of New Zealand land – about 19 million hectares – is privately owned, with just over 16 million hectares of farmland. QEII provides a mechanism to protect outstanding natural features on this land before they are lost forever.

A QEII open space covenant is a legally binding protection agreement, which is registered on the title of the land. It is voluntary but once in place binds the current and all subsequent landowners. Each covenant is unique. It can apply to the whole property or just part of the property. There can be different management areas within a covenant with varying conditions. Open space covenants are generally in perpetuity though there can be a case for a variable term covenant i.e**.** Kawenata on Maori land, Life of the Trees, or Landscape Protection Agreements. Private property rights are not jeopardised by a covenant - the landowner retains ownership and management of the land. Visitor access is available only with the landowner's prior permission.

QEII provides landowners with ongoing management advice and support. A management plan may be prepared with the landowner when a covenant is established, which sets out ongoing management objectives and provides guidance on such aspects as species management, pest control and restoration methods. A QEII regional representative visits each covenant regularly, usually every 2 years, to monitor its condition and trends, identify and address any threats, and advise the owner about how to meet the covenant objectives. Monitoring shows the majority of covenants meet not only the terms and conditions of their covenants but exceed them. Approximately 50% of open space covenants have changed hands at least once but adherence to covenant requirements is not affected by change of ownership. Regular monitoring shows that subsequent owners comply with the covenant terms and conditions as consistently as the original covenantors.

The Trust has a Regional Representative (Nan Pullman) based in Whangarei. She provides advice and support to QEII covenant holders within Whangarei District. This includes; managing the registration of covenants, establishment of perimeter fencing, providing support for funding applications, the preparation of management plans, and monitoring. Nan also contributes to the Northland Agricultural Field Days and the Biodiversity Northland Forum. The Whangarei District Council makes an annual financial contribution to assist with the establishment of Open Space covenants within the District.

NZ Landcare Trust ***www.landcare.org.nz***

NZ Landcare Trust encourages sustainable land management, empowering both landowners and community groups to make a positive change. They have a grass roots approach with an emphasis on 'action on the ground'. The Trust is involved with a range of field based projects from large 'catchment based' projects which deal with a range of complex issues to smaller landcare groups with a specific biodiversity focus. Advice is provided on landcare issues to farmers, landowners and a diverse range of community groups through site visits, meetings, workshops, field days and community based events. In 2007/08 NZ Landcare trust worked on 13 projects; including eight Sustainable Farming Fund projects, two Sustainable Management Fund projects, and three Department of Conservation Biodiversity Advice Fund projects. In addition the Trust supported 233 Landcare Groups across New Zealand to plant trees, protect waterways, control pests and foster native flora and fauna, in an attempt to maintain a productive, sustainable landscape.

The Trusts Regional Co-ordinator for the Upper North Island (Helen Moodie) is based in Whangarei. She provides advice and support to Landcare Groups within Whangarei District, a large contribution to the Northland Agricultural Field Days, Biodiversity Northland Forum, Totara and Clover Root Weevil Projects, as well as acting as a Rural Support Trust member (MAF).

Fish and Game New Zealand ***www.fishandgame.org.nz***

Fish and Game New Zealand is the collective name for the New Zealand Fish and Game Council and 12 regional Fish and Game Councils established in 1990 to represent the interests of anglers and hunters. It provides co-ordination of the management, enhancement, and maintenance of sports fish and game birds and their habitats by anglers and hunters under Section 26B of the Conservation Act 1987.

Sports fish were introduced to New Zealand by anglers, and are defined in the Freshwater Fishing Regulations 1983. They include; trout, salmon, tench, perch and rudd. Game birds include species native to New Zealand i.e. paradise shelduck, grey duck, and those brought to New Zealand for hunting i.e. geese, swans, pheasants, partridges and quail. The species available to game bird hunters are defined in the Wildlife Act 1953.

Fish and Game NZ is a user pays/user says system. Everyone wanting to go sport fishing or game bird hunting must buy a licence. Councils employ professional staff to carry out their work, and are assisted by volunteer rangers. The Northland region has a manager and a field officer based in Whangarei. They undertake a range of functions including; providing habitat assistance and advice to property owners, promoting the value of wetlands, research and monitoring, administering the Northland Sports Fish and Game Bird Management Plan (2003), managing licenses, liaison with other organisations, and ensuring all RMA processes are undertaken in a way that provides protection for sports fish and game bird habitat and angler and hunter access.

Specific site management within Whangarei District includes maintaining and enhancing the game bird habitat at the Jack Bisset and Hikurangi wetlands (as part of a long term lease obligation with

Whangarei District Council), and providing habitat for waterfowl and upland game in the Wairua and Manganui River Wildlife Management Reserves.

Royal Forest and Bird Protection Society of New Zealand ***www.forestandbird.org.nz***

Forest and Bird is New Zealand's largest, and longest-serving, conservation organisation. It was formed in 1923 in response to the widespread extinction of native species and destruction of native forests. Forest and Bird is a non-government organisation with more than 30,000 members. It works to preserve our natural heritage and native species supported by the subscriptions of members, donations and bequests.

Forest and Bird advocates for better legislation and policy which support environmental protection for threatened species and ecosystems, co-ordinates hands-on restoration projects, and educates people about environmental issues through a children's club (Kiwi Conservation Club), publications and public awareness campaigns. Forest and Bird also works with other environmental organisations, such as BirdLife International, on environmental issues in New Zealand's Exclusive Economic Zone, the wider Pacific and in Antarctica.

The Northern Branch of Forest and Bird is based in Whangarei, and the Secretary is Bev Woods. The activities of the Northern Branch include; making submissions on District Plan changes and resource consent applications, assisting with the maintenance of the Maly Reserve, restoration of Limestone Island, the activities of the Bream Bay Coastal Care Group, and organising field trips and meetings to facilitate information sharing.

The Ornithological Society of New Zealand Inc. ***www.osnz.org.nz***

The Ornithological Society was founded in 1939 and has about 1000 members world-wide ranging from professional ornithologists and government institutions to students and experienced amateur observers. The aims and objectives of the Society are to: encourage, organise and promote the study of birds and their habitat use particularly within the New Zealand region, foster and support the wider knowledge and enjoyment of birds, promote the recording and wide circulation of the results of bird studies and observations, produce a journal and any other publication containing matters of ornithological interest, effect co-operation and exchange of information with other organisations having similar aims and objects, assist the conservation and management of birds by providing information, from which sound management decisions can be derived, maintain a library of ornithological literature for the use of members and to promote a wider knowledge of birds, and promote the archiving of observations, studies and records of birds particularly in the New Zealand region.

The Northland Branch of the Ornithological Society is based in Whangarei, and the Regional Representative is Katrina Hansen. The activities of the Northland Branch include; wader counts, annual census of Whangarei and Kaipara harbours, beach patrol for wrecked seabirds on both the

east and west coasts, recording unusual bird sightings, and protection and monitoring of NZ fairy terns at Ruakaka, Waipu and Mangawhai.

NZ Herpetological Society Incorporated ***www.reptiles.org.nz***

The New Zealand Herpetological Society was formed in 1969. The objectives of the society are to; promote awareness and interest in amphibians and reptiles and their conservation, to encourage the study of New Zealand species, and to encourage the captive keeping and breeding of both New Zealand herpetofauna, and such exotic species of reptiles and amphibians as may be legally kept.
A high proportion of New Zealand's reptiles and amphibians are unique and endangered. The Society is dedicated to ensuring the continued survival of this important but little known group of animals, including providing the data required to compliment the activities of larger conservation organizations.

Dune Restoration Trust of New Zealand ***www.dunestrust.org.nz***

The Dune Restoration Trust was formed in 2007 to continue the work of the Coastal Dune Vegetation Network. The vision of the Trust is "To see the majority of New Zealand dunes restored and sustainably managed using indigenous species by 2050".

The Trust brings together organisations and individuals including regional and district councils, research agencies, forestry companies, tertiary education institutes, iwi, consultants, nurseries and community groups, such as Beach Care and Coast Care, to share information on sand dunes with an emphasis on the use of NZ native dune vegetation to restore the dunes' natural character, form and function.

The goals of the Trust are to; provide a network for information exchange on sustainable management on dune ecosystems, facilitate research on New Zealand dune ecosystems, and promote public awareness of proven methods for protection, restoration, conservation and sustainable management of dune ecosystems. The Trust held a workshop on Dune Restoration and Climate change was at Baylys Beach, Dargaville in October 2008.

World Wildlife Fund – New Zealand ***www.wwf.org.nz***

The World Wildlife Fund is one of the world's largest independent organisations dedicated to the conservation of nature. It was founded in 1961 and operates in around 100 countries. It is a science-based organisation which works together with many sectors i.e. government, business, science, environment, community to find solutions to environmental problems. Initially the work of WWF consisted mainly of the protection of animals and plants threatened with extinction, because they are part of a complex chain in which the disappearance of even a single species can have far reaching consequences. The scope of the work has since broadened to include; pollution, marine protection, climate change, environmental education, and sustainable ways of using the planets natural resources.

WWFs mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature. WWF works to achieve this by; conserving the world's biological diversity, ensuring the use of renewable natural resources is sustainable, and promoting the reduction of pollution and wasteful consumption.

WWF-New Zealand is part of the global network. It is committed to saving the indigenous species and ecosystems of New Zealand. Its community and education programmes support people to re-establish crucial areas of natural biodiversity. The climate change programme urges business and government to make the issue a priority through policy and action. WWF-NZ also works at an international level to aid sustainable development. It promotes positive action to reduce the impact of climate change, it campaigns to stop dolphins and seabirds being caught by fishers, educates the next generation about the importance of managing our environment more sustainably via an Environmental Education Action Fund, and resources communities in vital backyard conservation via a Habitat Protection Fund.

Environmental Defence Society

The Environmental Defence Society is an environmental non-government organisation comprised of resource management professionals who are committed to improving environmental outcomes within New Zealand. This primarily involves assisting individuals, community groups and businesses to more effectively participate in processes under the Resource Management Act 1991. The activities of the society also include; undertaking research and policy analysis on key environmental issues, publishing findings, and profiling contemporary environmental issues through seminars and conferences.

Friends of Matakohe/Limestone Island Society Inc www.limestoneisland.org.nz

Motu Matakohe, also known as Limestone Island, is a 37ha (100 acre) island in the upper reaches of Whangarei Harbour. Community input into management of the island was instigated in 1989 following the preparation of an Island Management plan by Whangarei District Council. A voluntary community group, Friends of Matakohe – Limestone Island Society (FOMLIS), was formally registered in 1993. Community input has steadily increased over the years and resulted in restoration of the island. An ecological restoration plan was prepared in 2000 - Matakohe-Limestone Island Scenic Reserve Restoration Plan.

Planting began in 1989, and over 115,000 plants have been planted. In the mid 1990s a cabin was moved onto the island, and a Ranger employed. The work of the rangers includes; predator and weed control, track maintenance, restoration planting, Argentine Ant survey, coordinating volunteers, managing the fire risk and illegal activity, maintenance of infrastructure, and liaison with other organisations.

Kiwi were introduced to the island in 2001 as part of the Department of Conservation – Operation Nest Egg Programme. From 2004-2007 47 kiwi chicks graduated from the island creche and were returned to the mainland, mostly at Bream Head kiwi sanctuary. One hundred and fifty one grey faced petrel chicks transferred from Taranga (Hen) Island to Matakohe Island successfully fledged between 2004-2008. Banded rail have self-colonised the island and are breeding, as are Caspian and white-fronted terns. In 2007, 29 shore skink were released, and in 2008 30 ornate skink were released as a part of this programme to re-introduce lizards to the island. Weta, stick insect, and flax snail have also been released.

Cats, possums and rabbits have been eradicated. Rodent eradication has been unsuccessful, so bait stations are utilised for control. Trapping is carried out on the island for mustelids, and in a buffer zone (Rat, Rabbit and Knight Islands, harbour shoreline). Tracking tunnels are utilised to monitor re-invasion. Chemical and mechanical control of a range of pest plant species occurs. These include, in order of priority; periwinkle, Mexican devil, moth plant, blackberry, pampas, tobacco weed, privet, cotoneaster, Mexican daisy, wattle, German ivy, Nasturtium, Taiwanese cherry, Kahilli ginger, and exotic palm-tree species

Major sponsorship for the activities of the Society was obtained from Golden Bay Cement from 1998-2008. The Whangarei District Council, the Department of Conservation, and the Bank of New Zealand Save the Kiwi Trust provide support.

Pukenui / Western Hills Forest Charitable Trust ***www.pukenuiwesternhills.org.nz***

An integrated management regime for Pukenui / Western Hills Forest, and the associated natural watercourses and wetlands, was proposed in 2003 by Whangarei District Council (WDC) and the Department of Conservation (DOC). The area is located to the immediate west of Whangarei City, and encompasses Pukenui Forest, Whau Valley water supply catchment, Coronation Scenic Reserve, Whangarei Quarry Gardens, Barge Showgrounds and several adjacent small reserves.

In 2004 possum control was carried out over the 2200ha by the Department of Conservation and Whangarei District Council, who contracted the work to Northland Regional Council.

A Community Advisory Committee (AC) and Nga Ahi Kaa o Pukenui (NAKP), the latter representing the three hapu with interests in Ngahere o Pukenui, assisted with the preparation of the Draft Pukenui Forest Ngahere o Pukenui Management Plan which was published in 2006. The objective of the management plan is *"To restore to the forest (ngahere) a healthy diversity of indigenous plants and animals and of ecological processes within the forest."* Whangarei District Council staff are going through the process of obtaining Ministerial consent for the Plan.

In August 2008 The Pukenui / Western Hills Forest Charitable Trust was formalised. The purpose of the Trust is the "Establishment and maintenance of a restoration programme for protection of

indigenous flora and fauna, historical, cultural and archaeological features and to enhance its recreational and educational potential in ways which are compatible with the values of the Pukenui / Western Hills Reserves". The current chairperson is Alan Martin.

The Trust has drafted an Operational Plan and a Communications Plan, and are working closely with Whangarei District Council, Northland Regional Council, Department of Conservation, local iwi and NorthTec to progress restoration. Feral goat control commenced in 2009.

Bream Head Conservation Trust www.breamheadtrust.org.nz

Bream Head Scenic Reserve, situated at the entrance to Whangarei Harbour, is classified as an outstanding ecosystem supporting a diversity of species. The reserve contains unique archaeological, historical and landscape features and the largest remaining intact stand of coastal broadleaf and pohutukawa forest in Northland. Many people use the area for walking, tramping, beach picnics, fishing, and photography. The Bream Head Conservation Trust was established as a partnership between Iwi, the Community, the Whangarei District Council , and the Department of Conservation in 2002 to restore the ecology of the reserve, to preserve its historical and archaeological features, and to enhance its recreational and educational potential in ways which are compatible with conservation values.

An Operational Plan, detailing the conservation work to be carried out, was prepared by the Trust and the Department of Conservation. A Restoration Committee manages this work. Members of the public can become a 'Friend of Bream Head' or volunteer i.e. with the annual planting days have been conducted for the last five years.

In 2008 an Assessment of Environmental Effects was completed. This provided a description and assessment of the effects on the environment of a proposal to carry out an animal pest eradication programme, including the building of a pest-proof fence.

Mountains to Sea Conservation Trust Nga maunga ki te moana

http://www.marinenz.org.nz/index.php/about_us/mountains_to_sea_conservation_trust

The Mountains to Sea Conservation Trust - Nga Maunga ki te Moana was established in 2002 primarily to umbrella the Experiencing Marine Reserves and Whitebait Connection programmes. The Trust provides technical support for schools, community groups and government departments who are working on conservation initiatives. The vision of the Trust is for people to see our biodiversity - coastal areas, streams, lakes and wetlands - as respected taonga, and as part of the whole system. The Trust believes restoration of any part of the system supports the entire system, and views education as central to all environmental restoration.

The Whitebait Connection Programme aims to inspire and educate schools, community groups and tangata whenua, to restore and take care of the life sustaining force of their local streams and catchments. It is an action based environmental education programme helping people to understand and become involved in the future health of our local streams and rivers. At He Kakano Community Nursery in Whangarei children grow riparian seedlings from seed they collected. Community planting days are subsequently held at their respective streams i.e. Te Kura Kaupapa Maori O Rawhitiroa are restoring the life force (mauri) of Waitaua Stream which flows into Whangarei Falls.

The Drains to Harbour Programme is also delivered by the Trust and aims to raise community awareness about the connection between our drains and waterways, and what we can do to minimise storm water pollution. A coordinator delivers a classroom workshop on local storm water issues, and a field trip to a local stream to find out where storm water ends up, the health of the waterway what lives there. The 'Drains-to-Harbour - Rainwater Only' message is stencilled on storm water drains to spread the word. Plaques are to be placed on all major storm water drains throughout the Whangarei District. Whangarei District Council has been involved in the development of resources for the programme.

Ngunguru Sandspit Protection Society Incorporated

The mission of the Society is to support protection of the natural, cultural and historic values of Ngunguru Sandspit so it is enjoyed, valued and cherished now and by future generations.

Recently (6/2/2010) the results of an independent investigation into community views, ownership and future options “Ngunguru Sandspit: What’s at Stake?” was presented to the community. For many years there has been debate over the status and potential development of Ngunguru Sandspit, as well as ongoing efforts to preserve the spit’s natural character and cultural values through potential conversion to a reserve or park. Landco’s (now Todd Property Group) development proposal generated questions over access, use and management. This report focuses on five key issues concerning the Sandspit.