14 INTEGRATED & CO-OPERATIVE MANAGEMENT OF KAIPARA ECOSYSTEMS, CATCHMENT AND HARBOUR

14.1 TABLE OF CONTENTS

14.2 LIST OF FIGURES

14.3 LIST OF TABLES

14.4 INTRODUCTION

The Kaipara harbour and catchment has a complex environmental management structure. Governance and management by multiple territorial and iwi/hapū authorities has resulted in a plethora of western legislation, policies and planning instruments. This has created conflicting management philosophies, conflicting management scales and a highly fragmented legislative framework.

The main regulatory agencies are: Auckland Regional Council, Northland Regional Council, Kaipara District Council, Whangarei District Council, Rodney District Council; Northland Conservancy, Department of Conservation, Auckland Conservancy Department of Conservation; and the Ministry of Fisheries (MFish). Te Iwi o Ngāti Whatua hapū hold mana whenua and mana moana status over the Kaipara harbour and catchment, and Te Roroa, Te Parawhau, Ngāpuhi and Ngāti Hine hold mana whenua in the northern parts of the catchment. Te Kawerau a Maki hold mana whenua status over part of the south-western catchment that encompasses the foothills of the Waitakere Ranges to Taupaki.

In 2007, a detailed study into the coastal management of the Kaipara Harbour was carried out that included an international literature review and in-depth interviews with 60 people involved in coastal management (Peart 2007). The review focused on understanding how managers and stakeholders see environmental issues; how managers approach their tasks and how they see future challenges within the context of the Kaipara Harbour. Peart (2007) also describes how these issues, particularly commercial fishing, sedimentation and aquaculture, are managed and explores the extent to which management is integrated. Peart (2007) provides recommendations and opportunities to move towards integrated management in the Kaipara Harbour to address these three environmental issues. This chapter will reflect and include some of the findings and recommendations.

This chapter describes the current environmental management legislation, policy and planning framework that occur in the Kaipara Harbour, catchment/whenua and its ecosystems. This chapter will seek to understand how co-management and integrated management principles fit within this legislation, policy, strategic directions and 'intent'. This chapter reviews management objectives that address biodiversity, fisheries, climate change, kaitiakitanga, resource use and development, which is summarised under:

- Current statutory framework
- Traditional management
- Planning
- Monitoring

14.4.1 ISSUES

Key issues relating to the current management of the Kaipara harbour, catchment and ecosystems are encapsulated in two broad areas:

- Number of regulatory agencies – issues particularly around conflicting management frameworks and management focus; authority and regulation over coastal marine area – the land-sea interface.
- Existing environmental issues, namely, declining fish stocks, environmental effects of fishing, increasing, land-based derived sedimentation and declining water quality; increasing resource use and development; unhealthy mauri; loss of biodiversity.

14.5 CURRENT STATUTORY FRAMEWORK

14.5.1 THE RULES: COAST AND LAND

This section briefly describes the main environmental and resource management statutory and non-statutory instruments influencing protection of ecosystems, ecological sustainable development and resource use in the Kaipara estuarine and terrestrial ecosystems. This section will ask the question of how the current statutory framework enables integrated management of Kaipara ecosystems.

Over the past two and a half decades, New Zealand has moved from a single issue focus to integrative management. The 1990s introduced 'second generation' environmental law reforms where, within one statute, laws relating to the use of land, air and water, were amalgamated into the Resource Management Act 1991 (RMA). The RMA embraced integrated management with a focus on ecosystems. The RMA came into force in 1991 and replaced four significant pieces of legislation affecting the Kaipara: the *Town and Country Planning Act 1977* (TCPA), *Water and Soil Conservation Act*, *Soil Conservation and Rivers Control Act* and the *Harbours Act*. The RMA emphasises integration across media and agencies, while sustainably managing natural and physical resources (Williams 1997); guides regulation of land and water use, pollution control, and coastal marine activities. The RMA also addresses environmental 'externalities' or adverse effects of activities on ecosystems, by controlling the impacts rather than activities (Williams 1997).

The RMA also gave regional councils planning and regulatory powers from water catchments out to 12 nautical miles of the territorial sea. The regional councils' focus was to achieve *section 30 (1) (a)* '*integrated management of the natural and physical resources of the region*'. The Regional Councils that manage the Kaipara Harbour and its catchment include: Auckland Regional Council, Northland Regional Council, Kaipara District Council, Whangarei District Council and Rodney District Council (Figure 4). A small proportion of the Kaipara catchment also lies in the jurisdiction of the Far North District Council.

The RMA includes of 'matters of national importance', environmental priorities and guidance; enables the assessment of environmental effects; is founded on participation and consultation in the regard to policy development, coastal plans, regional and district plans, sustainable development projects and resource consents. The RMA also enables the use of the 'precautionary principle' when assessing approvals of uncertain development and use. The Principles and Purpose of the Act (s.5) are:

> '*….to promote the sustainable management of natural and physical resources….[by] managing use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while:*
>
> *(a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
>
> *(b) safeguarding the life-supporting capacity of air, water, soil and ecosystems; and*
>
> *(c) avoiding, remedying, or mitigating any adverse effects of activities on the environment."*

The RMA dominates environmental management but appears to have minimal effect on the protection of Kaipara ecosystems. Other legislation is in force but manages at different scales, and/or governs issues for allocation of resources, such as fisheries legislation; administration, or policy development and the management of public lands for conservation purposes.

The Ministry of Fisheries has jurisdiction over the coastal management of fish and shellfish stocks in the Kaipara Harbour and this is detailed in Chapter 10 ('Restoring Sustainable Use of Fish & Invertebrate Stocks). Fisheries are managed under the Quota Management System (QMS). However, Regional Councils and the Minister of Conservation control aquaculture under the *Resource Management (Aquaculture Moratorium) Act 2002*, the *Resource Management Amendment Act (no4) 2004* and the new Part 7A and Part 6; and *Aquaculture Reform (Repeals and Transitional Provisions) Act 2004*; and the Department of Conservation and the Northland Fish and Game Council manage freshwater fisheries and sport fishing within the lakes and rivers of the Kaipara catchment; while the Ministry of Transport and Regional Council harbourmasters manage navigation and safety. Since 2004, Regional Councils manage biosecurity under the *Biosecurity Act 1993* and through Regional Pest Management Strategies to minimise or prevent threats of invasive pests to biodiversity, primary production, water quality, human health and Māori values.

The Department of Conservation Northland Conservancy manages the northern Kaipara and Auckland Conservancy manages the southern Kaipara, with both conservancies having similar boundaries to the Regional Councils (Figure 4).

There is a plethora of statutory and non-statutory documents (Table 1) that manage Kaipara ecosystems, whenua and moana, particularly in relation to elements such as biodiversity, fisheries, water quality, sedimentation, climate change, resource use and development. This produces a challenging management, planning and monitoring situation, and most agencies are charged with the same responsibilities under the RMA, *Local Government Act (2002)* and *Biosecurity Act (1993)*. Table 2 describes the presence of these elements relevant to the Integrated Kaipara Harbour Management Project, within the statutory and non-statutory documents[1] that manage Kaipara ecosystems.

[1] When these instruments were reviewed for the 'elements' identified in Table 3 [i.e. IKHMG longterm objectives]. The green squares, signals the presence of the 'element' within the instrument.

Table 2 also summarises strategies and policy that influence environmental management and resource use of Kaipara harbour and catchment ecosystems.

What's Missing

There are other non-mandatory but statutory documents that do not play a role in the Kaipara. They are:

1. **Iwi Planning Documents** – usually covering the resource management issues within the iwi rohe.
2. **Coastal Compartment Plans** – small areas of coastal edge (*Resource Management Act 1991*)
3. **Regional Coastal Environment Plans** – coastal environment but only policies for land areas (*Resource Management Act 1991*)

Iwi management plans of any iwi authority must be recognised by Regional Council and District Councils plans.

Treaty of Waitangi

The founding document of New Zealand, particularly the principles (*Kawanatanga, Tino Rangatiratanga, Full Exclusive and Undisturbed Possession; Oritetanga, Kaitiakitanga, Whakawhanaungatanga, Tautiaki Ngangahau, He here kia mohio, Whakatika i te mea he*)[2] of the Treaty, has influenced many pieces of legislation since 1840. The obligation to take account of the Treaty of Waitangi is mentioned specifically in several pieces of legislation, such as the RMA (s8); the Conservation Act 1987 (s4 and Acts outlined in First Schedule of the Act); the Fisheries Act 1996 (s5 and s174).

The Treaty has a constitutional significance that underlies the foundation of New Zealand and influences all environmental protection and natural resource management (Williams 1997).

Article II of the Treaty of Waitangi states:

> [English] "..*the Queen of England confirms and guarantees to the Chiefs and Tribes of New Zealand… the full exclusive and undisturbed possession of their lands, estates, forests and fisheries.. [for] so long as it is their wish and desire*..."
>
> [Māori] "..*the Queen of England agrees to protect the Chiefs, the subtribes..in the unqualified exercise of their chieftainship over their lands, villages and… taonga*"

The English version stresses rights of property and ownership, while the Māori translation emphasises status and authority. The use of rangatiratanga should be interpreted as the

[2] Source for principles: Article I, II, III of Treaty of Waitangi particularly Kawanatanga, Tino Rangatiratanga, Principle of Full, Exclusive and Undisturbed Possession. The Remaining principles sourced from statutory provisions, relevant case law, or findings and reports of the Waitangi Tribunal, notably, Manukau, Muriwhenua reports.

right of tribal self-management rather than national sovereignty. In 1840, Māori had no idea of national sovereignty (Wright 1996).

Article II guarantees recognition of Māori rights. This is protection of their possession of fishing grounds, in the mana to control them, own customs and preferences (Waitangi Tribunal 1988). Environmental legislation today contains specific provisions for compliance with the Treaty of Waitangi (Resource Management Act 1991, Environment Act 1986, Conservation Act 1987).

Table 1. Environmental management agencies, legislation, focus and spatial scale of management influencing management in the Kaipara Harbour and catchment and its ecosystems.

Management Agency	Key Legislation	Spatial Scale	Management Focus
Ministry of Fisheries Minister of Fisheries	**Fisheries Act 1996** **Māori Fisheries Act 2004**	Freshwater (eels) and Territorial sea (12nm), EEZ	Fisheries management & fishing activities
Te Oku Kaimoana – Takutai Trust	**Treaty of Waitangi (Fisheries Claims) Settlement Act 1992** **Māori Commercial Aquaculture Claims Settlement Act 2004**	Territorial sea (12nm) EEZ	Fisheries Aquaculture
Department of Conservation Minister of Conservation	**Conservation Act 1987**	Land, Foreshore/Low water	Biodiversity Conservation Access to, or occupation of, seabed
	Marine Reserves Act 1971	Territorial sea (12nm)	Protection of marine areas.
	Marine Mammals Protection Act 1978	Territorial sea (12nm) EEZ	Protection of marine mammals
	Wildlife Act 1952	Land, Territorial sea (12nm), and EEZ	Protect & control native animals (birds, lizards, turtles, frogs, some insects, corals, great white sharks, Giant Grouper). Since 1996 has included marine species
Department of Conservation Minister of Conservation	**Resource Management Act 1991 (1996)**	Land, freshwater Territorial sea	Minimise effects of activities; Aquaculture

Management Agency	Key Legislation	Spatial Scale	Management Focus
Kaipara District Council Rodney District Council Northland Regional Council Auckland Regional Council		(12nm)	
	Reserves Act 1977	Land & foreshore	Protect & manage public & private owned land for recreational, wildlife, indigenous flora & fauna, landscape, & amenity
Kaipara District Council Rodney District Council Northland Regional Council Auckland Regional Council	**Local Government Act 2002**	Land, Territorial sea (12nm)	Promote sustainable development. Annual plans
Tangata Whenua – Te Uri o Hau	**Te Uri o Hau Claims Settlement Act 2002**	Te Uri o Hau rohe Kaipara Harbour & its tributaries Cultural Redress Properties	Kaitiakitanga of all natural resources
Tangata Whenua – Te Roroa	**Te Roroa Claims Settlement Act 2008**	Te Roroa rohe Cultural Redress Properties	Kaitiakitanga of all natural resources
Minister of Conservation Biosecurity New Zealand Northland Regional Council	**Biosecurity Act 1993**	Land, Territorial sea (12nm)	Control & detect invasive non-indigenous species

Management Agency	Key Legislation	Spatial Scale	Management Focus
Auckland Regional Council			
Minister of Conservation Kaipara District Council Rodney District Council Northland Regional Council Auckland Regional Council	**Foreshore and Seabed Act 2004**	Territorial sea (12nm)	Public access
NZ Historic Places Trust	**Historic Places Act 1993**	Land	Register & protect archaeological sites, built & structures.
Energy Efficiency & Conservation Authority	**Energy Efficiency and Conservation Act 2000**		Promotes energy efficiency standards. Encourages uptake of renewable energy.

Table 2. Legislation, policy and non-statutory instruments used to manage the long-term objectives and issues being addressed by the Integrated Kaipara Harbour Management Project.

	Biodiversity	***Fisheries***	***Water quality & sedimentation***	***Kaitiakitanga***	***Resource use & development***	***Climate change***	***Socio-economic***	***Integrated management***
Fisheries Act 1996								
Draft West Coast North Island Fisheries Plan								
Fisheries 2030 Strategy								
Marine Reserves Act 1971								
Marine Protected Areas Policy Statement & Implementation Plan (DoC & Mfish 2005) – non-statutory)								
Marine Mammal Protection Act 1978								
Biosecurity Act 1993								
NRC Regional Pest Management Strategy 2003 – Pest Animals & Plants								
ARC Regional Pest Management Strategy 2008 – Pest Animals & Plants								
Historic Places Act 1993								
Local Government Act (2002)								
RDC Long-term Council Community Plan 2006-2016								
KDC Long-term Council Community Plan 2009-2019								
WDC Long-term Council Community Plan 2009-2019								
ARC Long-term Council Community Plan 2009-2019								

	Biodiversity	***Fisheries***	***Water quality & sedimentation***	***Kaitiakitanga***	***Resource use & development***	***Climate change***	***Socio-economic***	***Integrated management***
NRC Long-term Council Community Plan 2009-2019								
Annual Plans (Local Government Act 2002 & RMA 1991)								
New Zealand Biodiversity Strategy 2000								
Oceans Policy Initiative 2000								
Conservation Act 1987								
Conservation Management Strategy Auckland 1995-2005								
Conservation Management Strategy Northland 1999-2009								
Reserves Act 1977								
Queens Elizabeth II National Trust Act 1977								
Resource Management Act 1991								
NZ Coastal Policy Statement 1994 (NZCPS)								
Review of NZ CPS 2006								
ARC Land, Water & Air Plan (2005)								
ARC: Sediment Control 2001								
NRC Regional Water & Soil Plan 2004								
ARC Regional Policy Statement 1999								
NRC Regional Policy Statement								
NRC Regional Coastal Plan 2004								

	Biodiversity	***Fisheries***	***Water quality & sedimentation***	***Kaitiakitanga***	***Resource use & development***	***Climate change***	***Socio-economic***	***Integrated management***
ARC Regional Policy Statement Coastal 2007								
ARC Regional Plan: Farm Dairy Discharges 1999								
Rodney District Plan Proposed 2000								
Kaipara District Plan Operative 1997								
Whangarei District Plan Operative 2007								
Foreshore & Seabed Act 2004								
Energy Efficiency and Conservation Act 2000								

Table 3. Key national environmental strategies influencing environmental management and resource use of Kaipara harbour and catchment ecosystems.

Strategy/Policy	Description & Management Focus
Oceans Policy Initiative 2000	Defined as '*the development of a common purpose for the management of oceans within a country's jurisdiction and the establishment of a governance system to deliver the purpose'* (Peart 2005). Initiated in 2000, problems and solutions scoped. Halted in 2003 while ownership of the foreshore & seabed was addressed. Government chose to continue Oceans Policy development with the drafting in 2008 of Exclusive Economic Zone Environmental Effects Bill. This is the area from 12 to 200 nautical miles. Principle responsibility of Ministry for Environment.
New Zealand Biodiversity Strategy 2000	Developed in response to increasing evidence of the significant decline in indigenous biodiversity (Department of Conservation 2000). The strategy provides objectives across ten themes related to biodiversity: biodiversity on land; in freshwater; issues concerning coastal and marine ecosystems; use of genetic resources; governance; Māori and biodiversity; community participation; information; knowledge and capacity; and New Zealand's international responsibilities. Principle responsibility of Department of Conservation.
New Zealand Coastal Policy Statement 1994	Framework to promote sustainable management of the natural and physical resources of the coastal environment (s5 and s6 of the RMA). Identifies what matters regional councils must include in regional coastal plans, which are mandatory. Regional coastal plans cover the Coastal Marine Area (CMA). Section 64(2) of the RMA allows the incorporation of a regional coastal plan within a more extensive regional plan to promote integrated management of the CMA. Such plans can span across the land and sea/CMA. These integrated plans are typically referred to as Regional Coastal Environment Plans, such as, the Auckland Regional Plan: Coastal. NZCPS 1994 is currently being reviewed (Department of Conservation 2008) and may provide an opportunity to further strengthen an integrated approach to coastal management.

Strategy/Policy	Description & Management Focus
Marine Protected Areas Policy & Implementation Plan 2005	An objective under the NZ Biodiversity Strategy 2000, policy sets a framework to establish a representative and comprehensive network of marine protected areas within the Territorial sea and EEZ (Department of Conservation & Ministry of Fisheries 2006). The management focus is on all marine activities. Attempts to systematically approach spatial marine protection.
Fisheries 2030 Strategy	Adopted by Ministry of Fisheries and the Minister of Fisheries in September 2009 focus' on increasing the contribution of the fisheries sector to the New Zealand economy (Ministry of Fisheries 2009). The Strategy outlines a 5-year Action Plan to specifically deliver on the goal of New Zealanders maximizing benefits from the use of fisheries resources within environmental limits. There are three core outcomes: (1) use, (2) environment and (3) governance. The Strategy is founded on values of tikanga, kaitiakitanga, integrity, respect, manaakitanga and principles of ecosystem-based management, conservation of biodiversity, precautionary approach, environmental bottomlines, meet settlement obligations, best available information, inter-generational equity, respect rights and interests, recover management costs.
Proposed National Policy Statement for Freshwater	The purpose of the National Policy Statement is to state inter-related and integrated objectives and policies for management of Freshwater resources and provide guidance to local government which is responsible for freshwater management. The NPS was developed to address issues such as: increasing pressures on quantity and quality of freshwater resources, decline in water quality, lack of protection of freshwater ecosystem, lack of efficiencies in use of water, impact of land-use particularly urban development and intensive farming practices; climate change, limited tangata whenua involvement in decision-making. The NPS is currently with an independent Board of Inquiry for consideration. It will be a key tool for achieving better and robust freshwater management. The NPS is now part of the New Zealand Governments 'New Start for Freshwater' strategy. Three processes have been outlined: (1) stakeholder-led collaborative Land and Water Forum to develop shared outcomes, goals and long-term strategies for freshwater; (2) engagement between Ministers and Iwi Leaders Group regarding management and allocation initiatives; (3) scoping of policy options on matters including allocation, quality and infrastructure. http://www.mfe.govt.nz/cabinet-papers/implementing-new-start-for-fresh-water.html

14.5.2 RELATIONSHIP BETWEEN CURRENT STATUTORY FRAMEWORK AND INTEGRATED, CO-MANAGEMENT

The integration between these statutory instruments only occurs to a limited extent between the *Resource Management Act 1991* and the *Local Government Act 2002*. The integration of these two instruments with other management mechanisms operating within the Kaipara Harbour and catchment currently does not occur. The linkage between the Resource Management Act (RMA) and plans prepared under the Local Government Act, and other legislation comes from the general provision in the RMA requiring councils to have "regard to" management plans and strategies prepared under other Acts (section 74(2)(b)(i)). Councils do tend to ignore other plans or strategies except some of those prepared by themselves under the LGA or under the Biosecurity Act. For example, current RMA plans and policies do not provide any provisions in the Conservation Management Strategies that could strengthen the biodiversity conservation matters that Councils are required to address under the RMA. Under the 2005 amendments to the RMA 1991, district and regional plans must now give effect to Regional Policy Statements.

The RMA recognises the need for holistic management by recognising the integration of plans of different councils, for example, particularly those across Mean High-Water mark. With regards to the Kaipara Harbour and catchment, the land and sea in the North are managed under separate rules to the land and sea in the Auckland region of the Kaipara. However, planning conflicts arise when the purposes and principles of other mechanisms are overlaid with the RMA, such as the Fisheries Act, Conservation Act and the Reserves Act. RMA policies and plans very rarely provide provisions to recognise Conservation Management Strategies prepared by the Department of Conservation to strengthen biodiversity conservation which is required by Councils to address under the RMA.

The prospect of integration between Kaipara and Rodney District planning for coastal development looks bleak as they both take different approaches (Peart 2007, Kirchberg 2007). Both District Plans are at different stages of development, with the Kaipara District recently notifying their Proposed Kaipara District Plan 2009. The Rodney District Plan is operative, apart from the 'Proposed West Coast Rural Policy Area' zone, which adds extra coastal landscape controls on buildings and on the modification of native vegetation, earthworks and modification of wetlands around the Kaipara Harbour and West Coast. These are not emulated to the same extent in the Proposed Kaipara District Plan.

Other challenges to integrated, co-management of Kaipara Harbour and catchment ecosystems include:

- Tangata Whenua are wishing to integrate, rather than co-opt, Mātauranga Māori based environmental management of the Kaipara Harbour; which encapsulates an approach similar to the western approach of sustainable resource management. This poses challenges for planning authorities who either are unwilling or lack the necessary skills to be able to recognise these views within current planning frameworks (Jefferies *et al.* 2002; Blackhurst *et al.* 2003).

- Spatial scale of mangement differs between regulatory authorities, tangata whenua and community (Peart 2007, Kirschberg 2007).

- No integration between fisheries planning, marine protection planning and regional coastal and district land planning. Currently no effective mechanism that allows for local management in inshore fisheries areas; and lack of integrated landuse (catchment management) and coastal planning under the RMA (Peart 2007, Kirschberg 2007).

- Adhoc allocation of resources under the RMA to specific uses. The default position of the RMA has been on a first in first served basis rather than a proactive approach. A move towards proactive allocation was the aquaculture reform and the need to establish aquaculture management areas for aquaculture to occur. However, the approach taken, that of assuming aquaculture in the Kaipara would be provided for, was challenged (Peart 2007, Kirschberg 2007).

- One consistent policy direction for areas of special value within the Kaipara Harbour coastal environment is required (Peart 2007, Kirschberg 2007).

- Lack of integrated management within the 'coastal environment' in the Northland Regional Coastal Plan, as seen in the ARPC, when assessing applications for coastal permits. Combining Auckland and Northland RPC coastal plans for the marine area of the Kaipara Harbour could also address this complex and challenging planning issue across the land-sea interface.

- Lack of any statutory framework to ground the integrated initiatives of the Integrated Kaipara Harbour Management Group (IKHMG) (Peart 2007).

- Market-oriented management philosophy (Peart 2007).

- Conflict between exclusive and non-exclusive rights between users of the kaipara harbour. For example, aquaculture practices have exclusive right to a marine area to occupy and use the Kaipara harbour ecosystem; compared to those whose rights are non-exclusive but are restrained by exclusive rights. This situation is leading to conflict, particularly in commercial fisheries. Peart (2007) believes that integration is unlikely to occur for Kaipara Harbour commercial fishing until an effective mechanism is created for local management.

- The integration of RMA and fisheries within a Mātauranga Māori framework could be progressed with more certainty when Te Uri o Hau and Ngā Rima o Kaipara complete Iwi Management Plans.

- A variety of environmental knowledge gaps that act as barriers to integrated management due to the presence of numerous regulatory bodies and to a lesser extent the size of the Kaipara (Haggitt *et al*. 2008).

The Advantages

Some advantages do exist that could provide a move towards a successful, integrated, ecosystem-based and co-management approach for the Kaipara harbour and catchment ecosystems. They include:

- Integrated Kaipara Harbour Management Project. With the participation of regional and district councils, moving towards integrated management has begun to enable holistic management of the single Kaipara ecosystem. Communication between agencies has improved through the establishment of the IKHMG particularly between regional councils and the Ministry of Fisheries.

- Good information base has been developed. The Kaipara Atlas, an integrated database, is an initiative of the IKHMG to better inform management decisions and identify important values, both tangible and intangible, across the harbour and catchment.

- Joint projects are underway between Auckland and Northland Regional Councils, particularly around monitoring within the harbour and understanding sedimentation rates and effects. This is being supported by new proposed research by NIWA, Landcare Research, AgResearch and Cawthron Institute.

- Specific policy and zoning for the coastal environment in Rodney District is being proposed. The West Coast Rural Policy Zone is proposed to address the need for added protection to the southern Kaipara coastal ecosystems, particularly for earthworks and vegetation clearance.

Current *Resource Management Act* (RMA) planning in the Kaipara is fragmented between land and sea planning (Figure 1). It is split between planning for regional (land) plans and planning for marine areas (through coastal plans), and if a catchment has two or more districts and regions there is also a split again with very little overlap. Figures 2 and 3 depict a possible pathway of RMA planning integration for the Kaipara where planning occurs from the land to the sea, similar to what is applied in the ARPC. Figure 3 goes further to integrate biodiversity conservation management founded on western scientific management principles and Mātauranga Māori.

Therefore, a management situation exists where there are different rules on the land versus the coast/marine environment and then again in the north versus the south. There is a lack of planning integration across Mean High Water Spring (MHWS), which is a widely recognised problem across the country (Peart 2005, 2007, Ministerial Review Panel 2009).

The catchment is governed and managed by other statutory documents, but mostly the RMA through the preparation of district plans focusing on landuse and regional plans focusing on broader catchment management issues such as sedimentation. There are many challenges for the governing bodies relating to the RMA itself including the lack of a strategic focus to planning under the Act. This is compounded by a problem with RMA planning common to most councils, that they fail to monitor whether the objectives and policies in their plans are being achieved (Bellingham 2009). If planning objectives are met it is unclear whether this has been deliberate or coincidental (M. Bellingham, pers. comm., Dec 2009).

Integrated initiatives, which are usually non-statutory and community-based, begin to implement necessary steps, multiple agencies and statutory processes/legislation are required. Unfortunately this provides no certainty that the actual outcome identified in the non-statutory planning documents will occur. This indicates a strong need for the

development of a statutory framework to support integrative initiatives and to provide outcomes with legal standing.

Figure 1. Fragmentation of RMA planning system

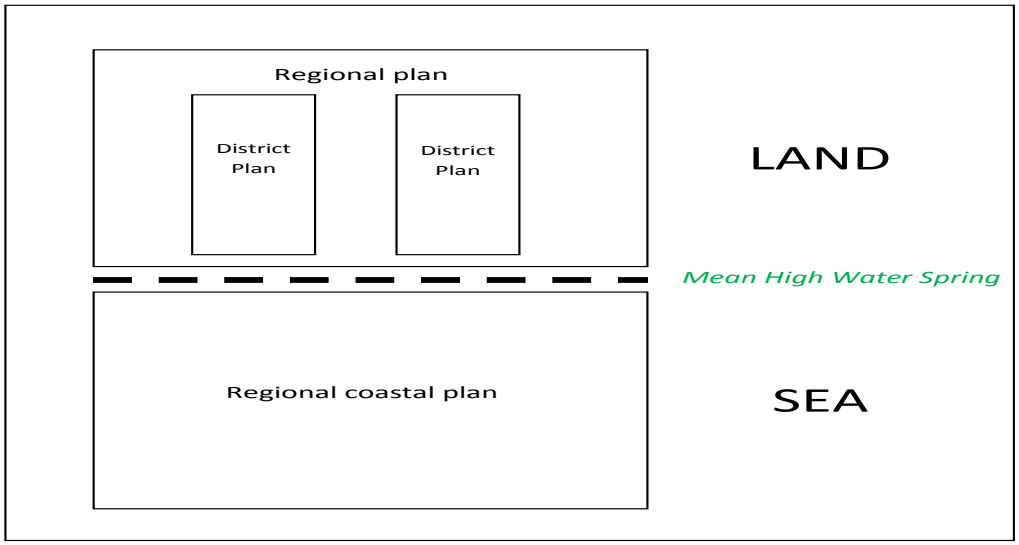


Figure 2. Integrating RMA planning

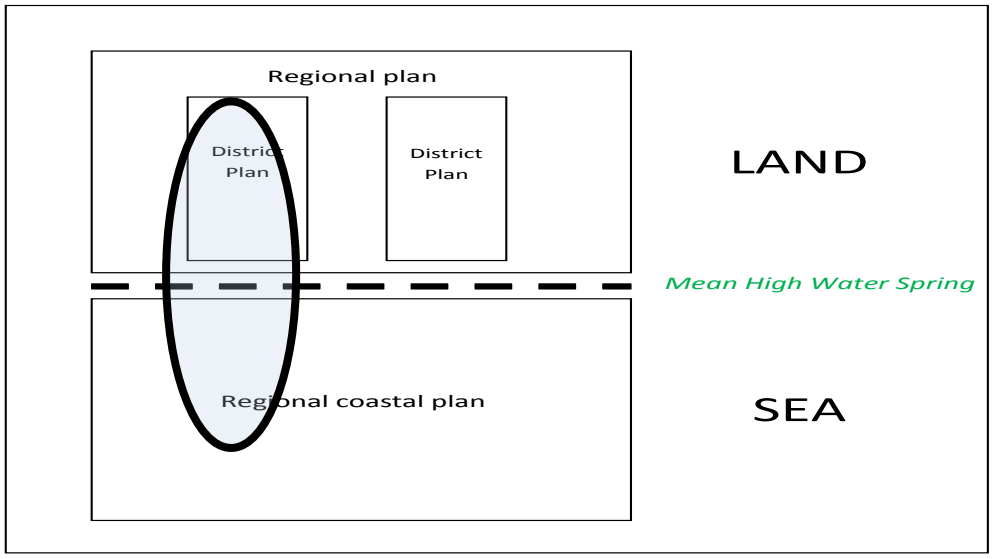


Figure 3. Integrating biodiversity protection, fisheries and resource use

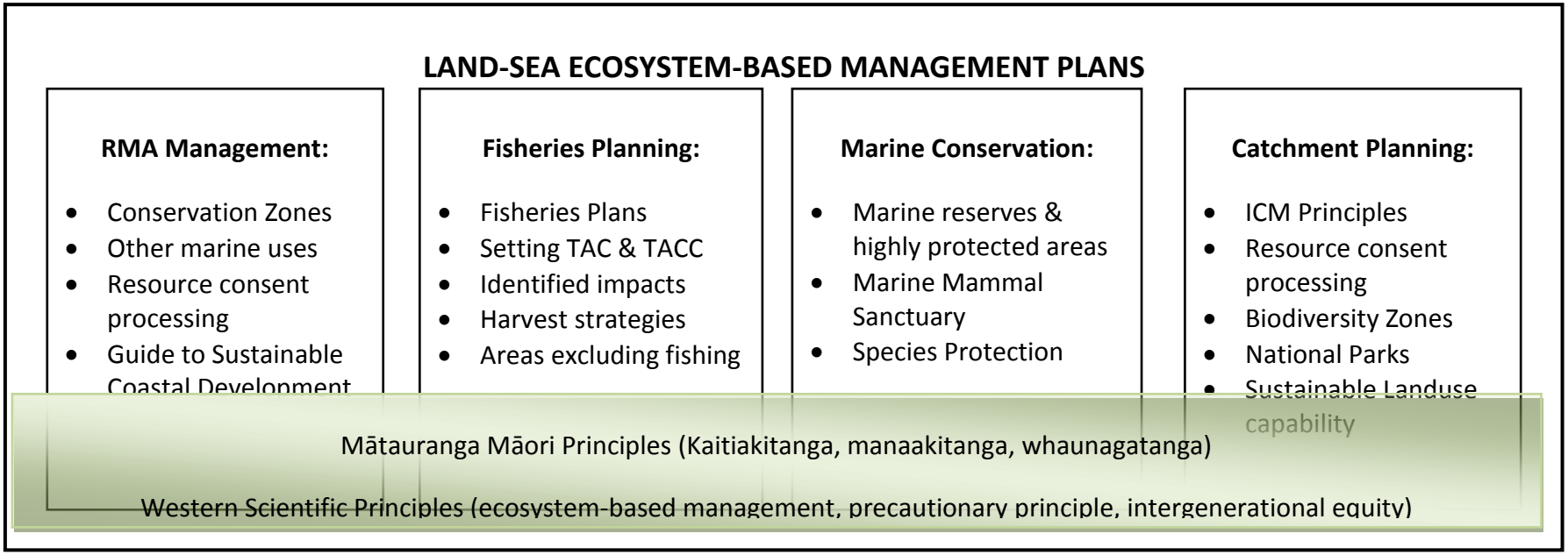
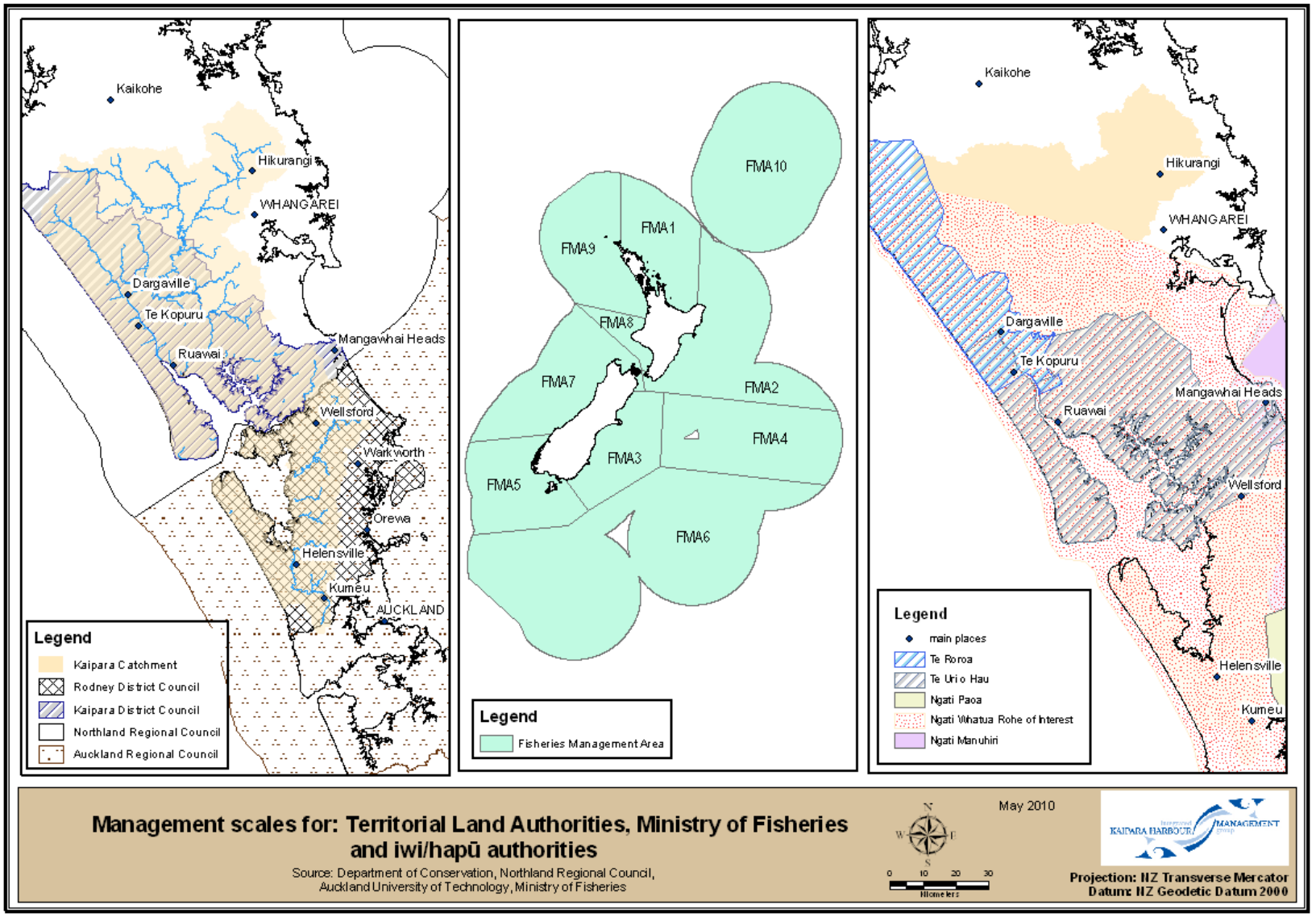


Figure 4. Spatial scales at which environmental and resource use management operates for the Kaipara ecosystems



14.6 THE ROLE OF MĀTAURANGA MĀORI AND CO-OPERATIVE MANAGEMENT

The role of Mātauranga Māori within a framework to manage the ecosystems of the Kaipara has yet to be fully explored within ecosystem-based management. However, there is evidence to suggest that kaitiakitanga is a valid resource management process that has been utilised by tangata whenua to protect and manage biodiversity, fisheries, mauri, and other natural ecosystems of the Kaipara for centuries (see Murton (unpublished)) illustrates this very clearly in his thorough assessment of what happened to Kaipara Māori and their access to and control of the harbour's resources.

Chapter 11 (Restoring Mauri of the Kaipara) provides a more detailed overview of how the Kaipara was sustainably managed through kaitiakitanga.

This chapter is more concerned with addressing the following questions with regard to co-operative management:

- How is a Māori worldview, incorporated/utilised in current environmental management of the Kaipara?
- What intergenerational obligations to tupuna are provided for?
- How do government agencies work with Kaipara Māori?
- What is the status of these relationships?

14.6.1 MĀORI WORLDVIEW IN ENVIRONMENTAL MANAGEMENT OF THE KAIPARA

The cultural, historical, traditional and spiritual beliefs of Kaipara Māori have been acknowledged in:

- Te Uri o Hau (Treaty of Waitangi) Settlement Act 2002
- Te Uri o Hau Deed of Settlement 2000
- Te Roroa (Treaty of Waitangi) Settlement Act 2008.
- Te Roroa Deed of Settlement 2008

For Te Uri o Hau, the Deed of Settlement acknowledged particular areas of cultural, historical, traditional and spiritual value. This included:

- *Kaipara Harbour Statutory Acknowledgement Area*
- *Ōruawharo River Stewardship and Deed of Recognition*
- *Ōtamatea River Stewardship and Deed of Recognition*
- *Wairoa River Stewardship and Deed of Recognition*

- *Arapaoa River Stewardship and Deed of Recognition*
- *Whakakei River Stewardship and Deed of Recognition*
- *Kirihipi overlay Pouto Stewardship and Deed of Recognition*

For Te Roroa, their Deed of Settlement also acknowledged particular areas of cultural, historical, traditional and spiritual value. This included:

- *Te Tahehu (Waipoua Forest) Statutory Acknowledgement Area and Statutory Management Regime (Protection Principles)*
- *Arai-te-Uru Recreation Reserve Statutory Acknowledgement Area and Deed of Recognition*
- *Tokatoka Scenic Reserve Statutory Acknowledgement Area and Deed of Recognition*

Te Uri o Hau Settlement Trust, through its mandated Kaitiaki Unit, Environs Holdings Ltd, engages through a set of Memorandum Of Understanding's (MOU) and Protocol Agreements with crown departments and Territorial Authorities to carry out the obligations set out in the treaty claim of 2002. Other MOUs and Protocol Agreements that play a role in the environmental management of the Kaipara harbour include:

- MOU between Te Uri o Hau Settlement Trust and Northland Regional Council 2002
- MOU between Ngāti Whatua Ngā Rima o Kaipara and Rodney District Council 2003 and 2007 (Relationship and positional statements)
- MOU between Te Uri o Hau Settlement Trust and Rodney District Council 2002
- MOU between Te Uri o Hau Settlement Trust and Auckland Regional Council 2002
- Protocol Agreement between Te Uri o Hau Settlement Trust and Department of Conservation 2002
- Protocol Agreement between Te Uri o Hau Settlement Trust and Ministry of Fisheries 2002
- MOU between Te Uri o Hau Settlement Trust and Kaipara District Council 2002
- MOU between Te Uri o Hau Settlement Trust and Fonterra (Maungaturoto Branch) 2006
- MOU between Ngāti Whatua Ngā Rima o Kaipara and Carter Holt Harvey (Riverhead Forest, Woodhill Forest)
- Te Roroa:
    - Minister of Fisheries & Ministry of Fisheries Protocol Agreement 2005
    - Minister of Conservation & Department of Conservation Protocol Agreement 2005

- Minister of Energy & Ministry of Economic Development Protocol Agreement 2005
- Minister for Arts, Culture and Heritage & Chief Executive of the Ministry of Culture and Heritage 2005

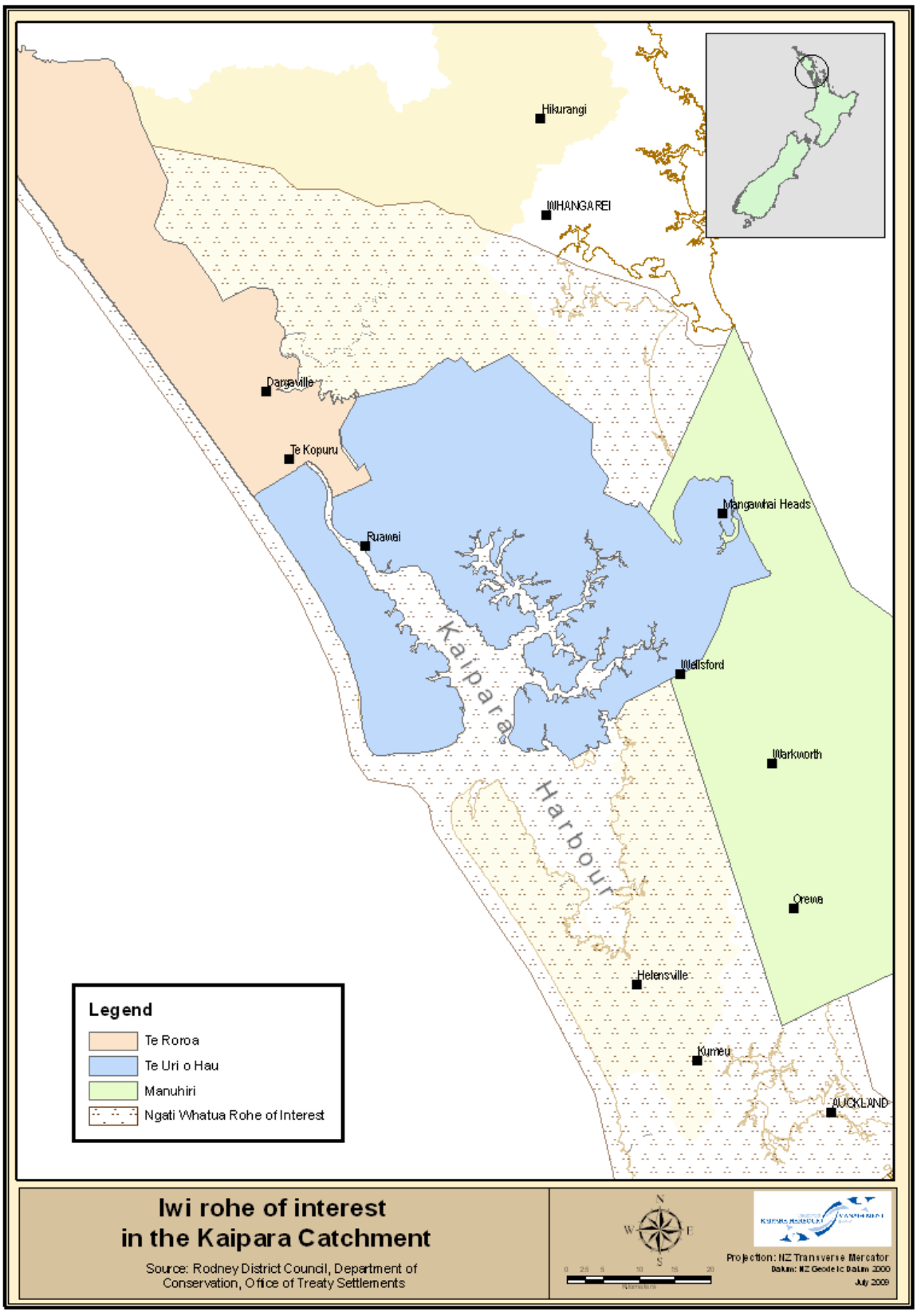
MOUs and Protocol Agreements with these organisations give practical effect to their role as Treaty partners in the future management of natural and physical resources within their rohe (Figure 5). An example of this is the recent exercise to undertake a Cultural Effects Assessment of Manchurian Wild Rice grass in the northern Kaipara, particularly along the Wairoa River (Environs Holdings Ltd 2009). Undertaking this assessment is a method in part of giving substance to TUOH and Te Roroa's Treaty Settlements. Other examples include:

- **Kaipara District Proposed Plan – Māori Purposes Chapter**
  The two major tangata whenua groups within the Kaipara District (Te Uri o Hau/Ngāti Whatua and Te Roroa) wrote the Māori Purposes Chapter for the 2009 Proposed Kaipara District Plan. This was an opportunity for Kaipara District Council to give effect to their MOU's with the tangata whenua, the Treaty of Waitangi and principles of the RMA.

- **Te Roroa Iwi Environmental Policy Document 2008/2009**
  The Te Roroa Whatu Ora Trust (TRWOT) developed a draft Iwi Environmental Policy in 2008 (Te Roroa Whatu Ora Trust 2008) to inform their future Iwi Environmental Management Plan. The draft document contains guidance on their policy and processes for kaitiakitanga, to their whanaunga to the north, west and south, to the wider community who resides in or values their rohe, and to current and future developers. Therefore, the policy is directed primarily at assisting the relationships between Te Roroa and all relevant government departments, agencies and councils involved in the management of natural, physical, cultural and heritage resources in their rohe.

For Te Uri o Hau and Te Roroa the exercise of rangatiratanga through the ability to manage and care for their lands and waters and their treasured ecosystems, waahi tapu and other taonga using their own practices and customs is paramount (Kaipara District Council 2009a). For Te Uri o Hau, whom has implemented their Deed of Settlement since 2003, they still feel the treaty settlement has not given them autonomy over their most sacred taonga and birthplace, the Kaipara Harbour, as they continue to utilise a large proportion of their treaty settlement resources into highly demanding and stressful resource consent processes. Such as the Crest Energy Ltd marine turbine proposal for the deployment of over 100 turbines in the entrance of the Kaipara Harbour (pers. comm., J. Chetham, past Manager, Environs Holdings Ltd, May 2009).

Figure 5. Hapū rohe of interest in the Kaipara catchment.



A review of policy statements, plan variations, strategic development reports and plans prepared under the RMA for both the Northland and Auckland region undertaken for this report, found that they do not adequately address the role of Mātauranga Māori in landuse, marine and resource management. The RMA allows for active participation by tangata whenua in environmental management, mainly via sections 6, 7 and 8, also sections 33, 34, 35, 93 and Clause 3 of the First Schedule (Appendix 7). These provisions strongly endorse Māori participation in the planning process and provide Māori interest's greater significance to those of other parties. This in effect acknowledges Māori as Treaty partners. However, Māori come to the table as participants and participate in an already established planning framework that is not necessarily founded on Mātauranga Māori principles (S. Awatere, Landcare Research, pers. comm., Nov. 2009).

A review of the Kaipara District Plan 1997 was undertaken by Jefferies *et al*. (2002) on plan quality by moving beyond the descriptive assessment to undertaking systematic evaluation of plans and planning processes. With regards to Māori participation in second generation RMA plans, such as the Kaipara District Plan, this is high, with both Te Roroa and Te Uri o Hau contributing to the plan. Strong relationships exist between Kaipara District Council and these hapū which have been strengthened through Memorandum of Understanding and Protocol Agreements under Settlement legislation. A strong relationship and participation in RMA issues and planning also exists between Ngāti Whatua Ngā Rima o Kaipara Trust and Rodney District Council.

There is a need to identify issues and concerns for iwi and hapū that lie within jurisdictions of district and regional councils and have appropriate objectives, policies and methods, including monitoring, within the district plan for dealing with them. Areas of improvement include:

- Clarity of 'cultural effects' definition in RMA planning, second generation regional and district plans. This should have reference to effects of an activity on iwi/hapū values, culture and taonga. Provisions under Part II of the RMA requires recognition and/or provide for iwi/hapū and their taonga and values, however clarity is required to better inform resource consent applications and process, decision rules in planning and policy documents. Cultural effects be specific to relevant iwi/hapū where activity occurs. They are only ones to identify those effects thus, need mechanisms in place to achieve this through hui, Wānanga and spatial mapping.
- Identifying and mapping important cultural landscapes & seascapes
- Clarity around monitoring and Māori role and participation in undertaking monitoring of plans.
- Investigation into why s33 (powers) and s34 (functions) have yet to be explored by NRC and ARC for iwi/hapū authorities of the Kaipara.

14.6.2 THE EROSION OF PROPERTY RIGHTS

Access to and the management of scarce resources is a phenomenon faced by humanity today and throughout our collective history. Early Māori were no different. According to

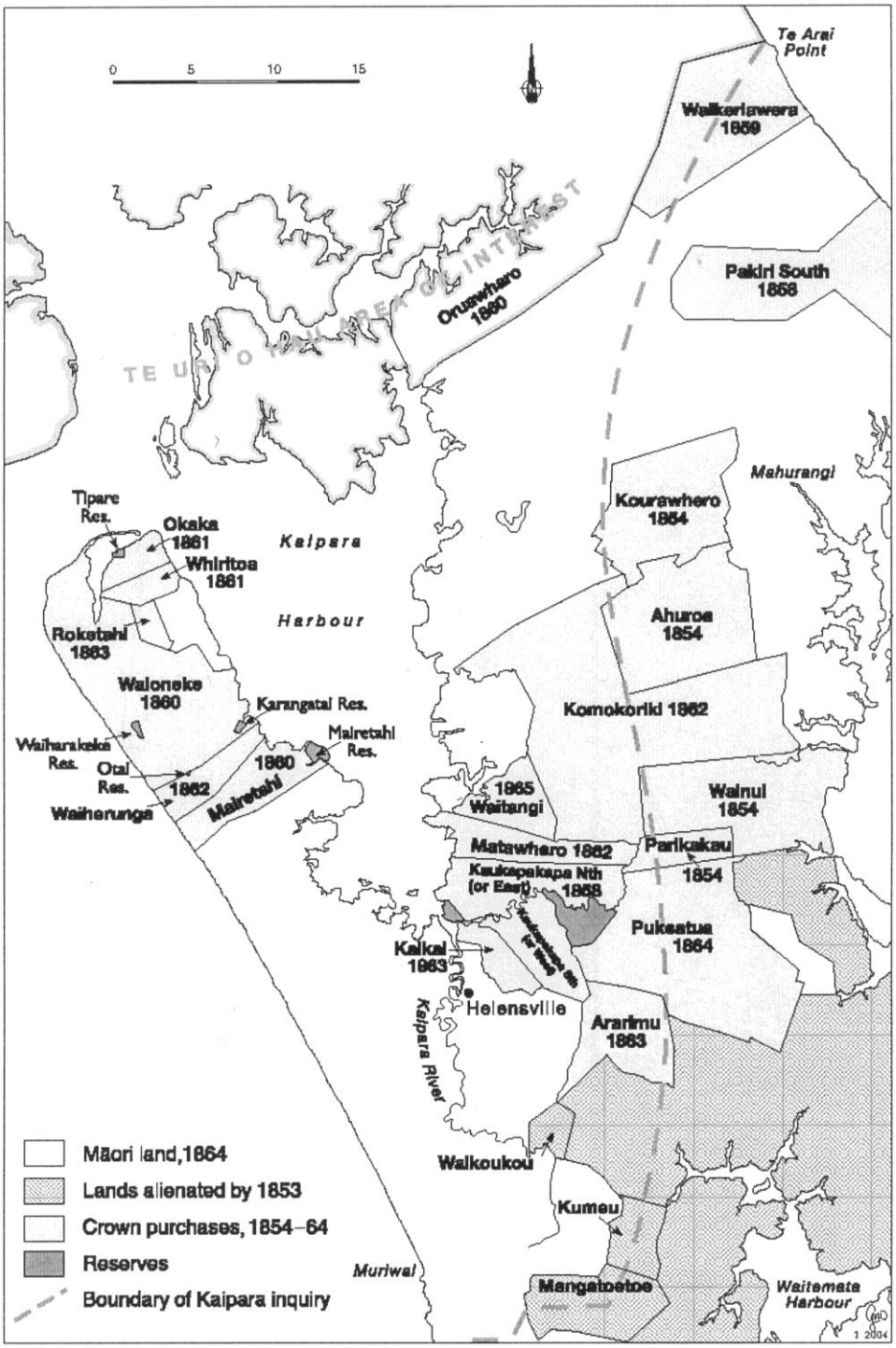
Wright (1996), the mana associated with controlling the use and access to resources was a pivotal force. It could, and it did, create many wars and many lives could be lost. It could cause mass migrations of tribes, as it did when Ngāti Awa migrated from the Victoria Valley in the north (Kaitaia area) because of social pressures that arose from an increasing population. Ngāti Whatua left the 'conquered land' between Maunganui Bluff and Hokianga because they thought the soil was of poor quality, obviously believing that the land could not sustain their people (Wright 1996).

Tribes sought the best for their whanau's welfare, wellbeing and resources. The resources of the Wairoa regions have always been valued by the Te Uri O Hau and their ancestors, not in a sense of money value but from the perspective of 'richness, wholesome, plenty and beneficial' value (Wright 1996). The sustenance and nourishment of a resource, such as the land or air for birds, is described as an 'umbilical cord' to Te Uri O Hau. The source of the resource is connected to the iwi and hapū maintained that reciprocity by nurturing it as if it was within them. If the bond or link between the iwi and the resource was ever severed, both would suffer.

It is hard to visualise what the Kaipara Harbour and its foreshore looked like in 1840. The early Pāhekā accounts help us little, and let us understand how important water transportation had been for Māori, and how important it was becoming for Pāhekā as they entered this new land. For Māori, and then Pāhekā, having access to the shore was crucial. In 1840 none of the foreshore of the Kaipara had been lost from Māori control, although Pāhekā were residing at Mangawhare and Hoanga, in the northern Wairoa, where later they would receive title to the land along the foreshore. In some places along the Kaipara foreshore, Pāhekā did not reside so Māori had no barriers to full use of the shore (Waitangi Tribunal 2006, Murton unpublished).

By 1865, after the award of several Old Land Claims, and ten years of active purchasing by the Crown, Māori ownership of foreshore and shoreline had begun to be eroded (Murton unpublished, vol 3) (Figure 6) . This was especially the case along the Wairoa River where the shores of Hoanga, Mangawhare, Te Kopuru, Tatarariki, Oruapo, Arapohue, Whakahara, Tokatoka, Matakohe and Te Kuri blocks had been lost. In the upper reaches of the Arapaoa (Matakohe and Paparoa), on the eastern side of the confluence of the Arapaoa and Otamatea, the eastern side of the upper Otamatea (Wairau, Pukekararo, Te Ika A Ranganui, Maungaturoto) part of the southern bank of the Oruawharo and a small area on the Tauhoa. The process of losing the shoreline was well under way. Most of the eastern side of the southern Kaipara remained in Māori hands, apart from Matawhero, Kaukapapkapa and Waitai, but on the south Kaipara peninsula more than a third of the shoreline had been sold (Waitangi Tribunal 2006, Murton unpublished).

Figure 6. Crown purchases in southern Kaipara before 1865. (Source: Waitangi Tribunal 2006)



Over the next 20 years Crown ownership increased considerably, mostly through private sales, to the point where Pākehā had come to dominate in their control of the shoreline of the harbour. After this, remote and less desirable parcels of land abutting the harbour was lost, so by 1930 Kaipara Māori owned very little shoreline property and as a result access to and the management of mahinga kai was diminished. The Waitangi Tribunal (1992, 2006) report and claimant research reports (e.g. Murton unpublished, Stirling 1996; Stirling 1998) detail the implications of this loss of control and rangitiratanga, authority to manage. In summary, this included:

- Fragmentation of entitlements. Kaipara Māori found themselves more often than not, excluded from schemes, such as cash advances to settlers (Murton unpublished, vol. 3). Thus, the economic opportunities and benefits were not provided to Kaipara Māori (Waitangi Tribunal 2006, chapter 3).
- Crown not ensuring that existing reserves were protected and that Māori retained ownership of enough land for their current and future needs (Waitangi Tribunal 2006)
- The loss of control over land prejudiced Kaipara Māori and hindered the economic, social and cultural development for Te Uri o Hau and Te Roroa (Waitangi Tribunal 1992, 2006).
- Negative health and social statistics (D. Harding, Te Uri o Hau Settlement Trust, pers. comm., 2009)
- An increasingly polluted Kaipara Harbour and its tributaries
- More importantly, a diminished capacity to actively manage and access mahinga kai thus, exercising very little effective authority in relation to the welfare and protection of their people.

The individualisation of 'ownership' and 'rights' to whenua conflicted with traditional Māori land tenure (Murton unpublished, Pond 1997). The traditional Māori land tenure systems can be characterised as an ancestral trust estate held indefinitely by the hapū but with internal use rights distributed amongst such ancestral descendants who used them. The use rights being transferable within families, but not outside of the group, without a general group sanction. Under Māori customary law, the western "ownership" concept, which vests the several rights of use, benefit, control, transfer, reversion and identification in a single proprietor divorced from community relationships simply did not apply (Murton unpublished, Pond 1997). In contrast, traditional Māori institutions were communally based with protocols for intra- and intergroup co-operation. Use and obligations were conditional upon contribution to the common good. For example, some but not all whanau were tasked with growing crops, while others had access to and managed diverse mahinga kai. The institution of mana guided the way resources were shared. Mana in this case is not so much about individual authority but more about collective well-being. Thus, the provision of resources for the collective not only enhances one's own mana but also the mana or well-being of the entire iwi or hapū (Durie 2001).

Erosion of communal rights to manage natural resources has had significant negative results for succeeding generations. For Ngāti Whātua, this is an impertinent outcome given the ineffaceable link between the iwi and the Kaipara as demonstrated through timeless tauparapara and mōteatea (Murton unpublished).

14.6.3 CO-MANAGEMENT WITH IWI/HAPŪ

The warrant for establishing co-management with iwi/hapū is provided by Section 4 of the *Conservation Act 1987*, which requires the Department of Conservation to '*give effect to the*

principles of the Treaty of Waitangi'. There are no 'top-down' legislative obstacles for the development of effective and full-scale co-management with iwi.

Co-management is likely to entail the devolution of management responsibilities for government, so the level of sharing or relinquishing of decision-making power may be contentious (Moller *et al*. 2000). In any co-management arrangement, the balance of power that is negotiated must recognise mana of each iwi and give effect to their status as a Treaty partner. This process will recognise the Kaitiaki who are vested with the role of ensuring the mauri is maintained and enhanced (Roberts *et al*. 1995). It also needs however, to recognise the responsibilities of statutory agencies, which have specialised scientific and local knowledge, and expertise in ecology.

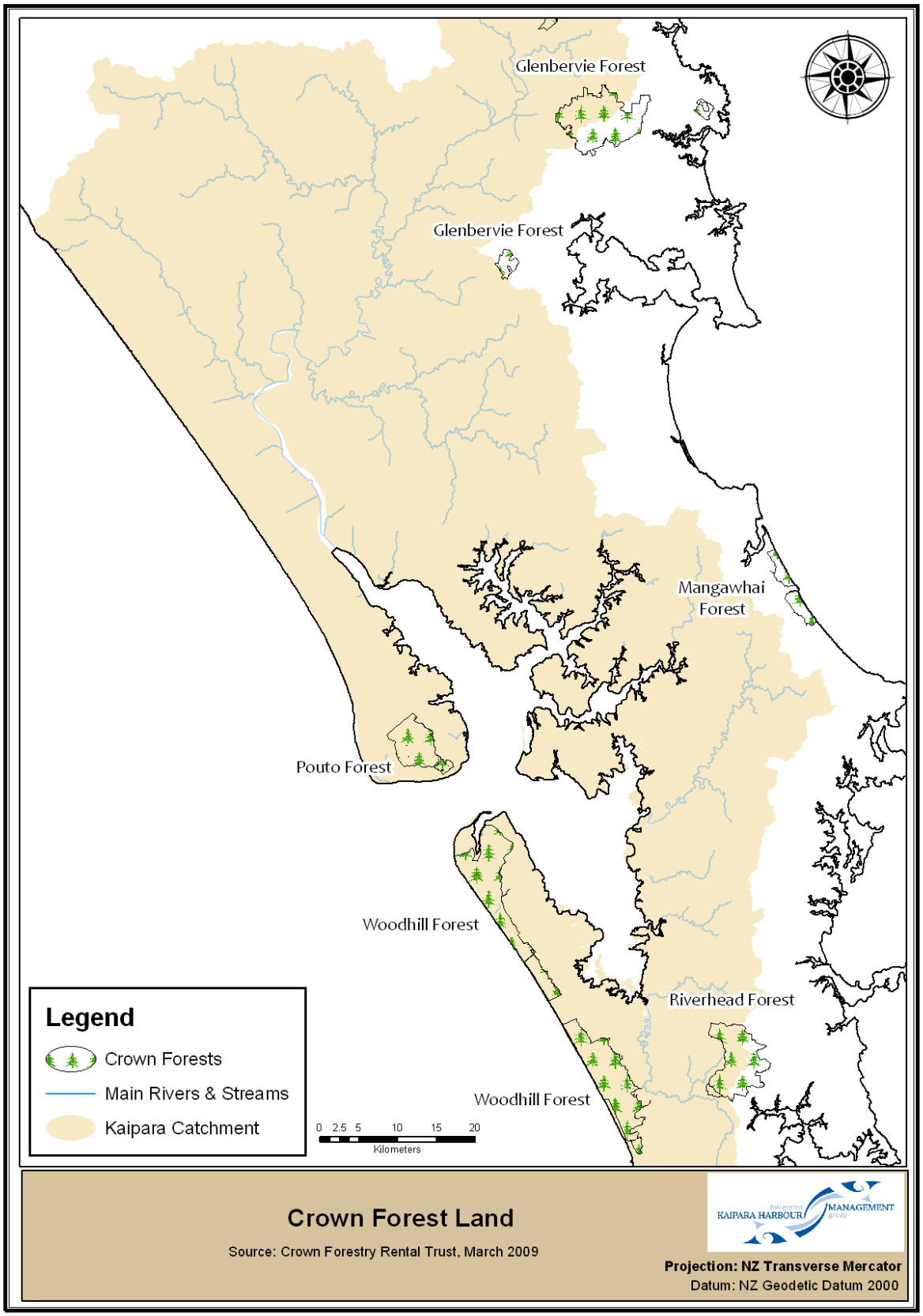
14.7 BIODIVERSITY MANAGEMENT – EASY AS WE GO, OR QUICK SMART?

In a global context, New Zealand has a special responsibility for biodiversity conservation, particularly as a high percentage of its 90,000 species are endemic and unique. Biodiversity is a term that has only recently appeared in the planning literature (Bellingham 2008), whereas it has been the currency of the ecological literature since the 1980s; and a feature of the 1987 Earth Summit and the World Conservation Strategy since 1990. The New Zealand Government eventually adopted a biodiversity policy in 2000 with the development of the New Zealand Biodiversity Strategy (DoC 2000) to address their responsibilities as a signatory to the Convention of Biological Diversity. From here, nature and biodiversity conservation has seen a significant expansion in funding and policy measures in New Zealand.

The Kaipara ecosystems, and its associated biodiversity, have dramatically altered since European settlement of the Kaipara from 1830's (Murton unpublished). The 'natural world' of the Kaipara, swamps, gumlands, sand dune country, kauri forest, kahikatea forest, flax and even large areas of the intertidal zone were altered, changed and re-vegetated in some shape or form. Kaipara's hills and lowlands were converted into high value, high producing pastoral land, similar to what was operating in Britain during the 1880's. Rough pastures of the hill country were given over to wool production, store sheep and cattle while smoother land and drained swamps served dairying. Most of the 'natural world' of the Kaipara was exhausted by the 1920's and 1930's (Murton unpublished).

By the time the Resource Management Act (RMA) was introduced in 1991, Government agency and Government-funded forestry and agricultural land development, using incentive schemes to establish pine plantations, had already cleared significant areas of the remaining lowland indigenous ecosystems (Halkett 1991). The New Zealand Forest Service clear-felled more than half of the remaining kauri forest of Northland and Auckland (Beever 1981; Ogle 1982; Bellingham 2008). The Governments incentive schemes' for indigenous forest and wetland clearance was phased out from November 1984 through to 1986 (Halkett 1991). The Kaipara catchment currently has 15.6% indigenous forest remaining (See Chapter "Restoring Biodiversity" for more information). Crown licenced exotic plantation forests currently occur in the Kaipara catchment at Pouto, Woodhill, and Riverhead and to the northeast of the catchment at Glenbervie forest (Figure 7); and 28,746 Ha (that is 8.9% of catchment area) of crown-owned public conservation land remains in the catchment.

Figure 7. Crown exotic plantation forests that occur in the Kaipara catchment.



The RMA introduced national policy statements, national standards and national water conservation orders, which potentially provided for the introduction of more definitive policy, standards and periodic reviews on biodiversity management into resource management and planning. However, the only national instrument to date is the mandatory New Zealand Coastal Policy Statement. Extensive public consultation and hui were undertaken during 1997-99 on a Biodiversity National Policy Statement (Ministry for the Environment 2001a) but the final document never eventuated. Instead the Government announced non-statutory criteria for identifying nationally important biodiversity sites in 2006 on private land (Ministry for the Environment & Department of Conservation 2007f).

One of the first analyses of biodiversity objectives in policy statements and plans applying to the Kaipara, was carried out by Bellingham (2008) using the Auckland Regional Council Regional Policy Statement, Auckland Regional Council Regional Land, Water and Air Plan, and Rodney District Plan as case studies. Bellingham (2008) used environmental appraisal methods against the biodiversity principles of the RMA 1991 and concluded that there are strong provisions for biodiversity conservation in these plans that support implementation of biodiversity conservation through district planning. The main problems with biodiversity conservation implementation in district plans arise from planners not making full use of the available factual base, a lack of monitoring and, failures by planners and ecologists to properly understand and communicate information for effective district planning (Bellingham 2008). Peart (2008) also concluded that the level of environmental information pertaining to the marine environment was incredibly lacking when compared to the terrestrial environment.

The Auckland Regional Council (ARC) also commissioned a technical publication reviewing the coastal environmental policy for the Kaipara Harbour (Kirschberg 2007). Both the ARC and Northland Regional Council (NRC) have identified the integrated management of the Kaipara Harbour and its coastal environment as an important issue. The publication involved a desktop analysis and interviews of council officers, and reviewed statutory policy and planning documents relevant to the coastal environment. The report did not review policy governing the terrestrial and freshwater environment of the Kaipara catchment, or review fisheries and biodiversity - management issues also facing the Kaipara.

National Policy & Biodiversity Management

The *Resource Management Act 1991* plays a key role in biodiversity management (Appendix 6) as almost all forms of resource use impact on terrestrial and marine indigenous biodiversity. However, with the increasing decline in biodiversity (DoC 2000, Ministry for the Environment 2007; Northland Regional Council 2007e), the approach taken to protect biodiversity on private land, where most threatened and rare ecosystems are found, is a voluntary, co-operative approach rather than a legislative framework (Ministry for the Environment & Department of Conservation 2007f). The Organisation for Economic Co-operation and Development (OECD) (2007) review of New Zealand's environmental performance noted the need to strengthen national policy guidance for biodiversity management, in the form of policy statements and national environmental standards, in the interest of promoting a level national playing field and improving regulatory efficiency.

In the absence of a National Policy Statement on Biodiversity, strategic policy guidance at the national level for Kaipara biodiversity found on public land is directed from the New Zealand Biodiversity Strategy (DoC 2000) and Conservation Management Strategies for

Northland (DoC 1999) and Auckland (DoC 1995), both currently under review. Biodiversity is also governed and managed under the *Conservation Act 1987* and the *New Zealand Coastal Policy Statement 2002*. Appendix 8 states the biodiversity objectives stated in these documents.

The National Policy Statement on Biodiversity (MfE 2001) draft outlined the key objective was to reflect Goal Three of the NZBS (DoC 2000):

> *"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 critically 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 natural range, and maintain their genetic diversity"*

The development of the NPS was of national significance in achieving the purposes of the RMA (MfE 2001a) and was to give effect to the NZBS (DoC 2000).

In 2007, Ministry of Environment and Department of Conservation (MfE 2007f) announced a Statement of National Priorities for protection of rare and threatened biodiversity on private land using non-statutory tools. A package of measures was introduced to protect biodiversity on private land, which is land outside the public conservation land estate. The package included:

1. *Contestable Funds* – QEII Trust, Ngā Whenua Rahui, Nature Heritage Fund, Condition & Advice Fund (Table 6).
2. *Regulatory Framework* – The NZBS (DoC 2000) plans for biodiversity conservation on private land is for an improved regulatory framework. Currently, the Resource Management Act has provided for biodiversity management by regional and local councils with an amendment in 2003 defining "biological diversity" (Appendix 6).
3. *Local government guidance* – Statement of National Priorities for the Protection of Rare and Threatened Biodiversity on Private Land (MfE 2007f).

Based on scientific research and analysis (Leathwick *et al.* 2002; Leathwick *et al.* 2003; Hitchmough *et al.* 2005; Williams *et al.* 2007) four national priorities (Table 4) have been identified to guide local and regional government (MfE 2007f).

Table 4. The four priorities in the Statement of National Priorities for the Protection of Rare and Threatened Biodiversity on Private Land.

Priority	*Statement:*
National Priority 1:	*To protect indigenous vegetation associated with land environments (defined by Land Environments New Zealand (LENZ) at Level IV), that have 20% or less remaining in indigenous cover.*
National Priority 2:	*To protect indigenous vegetation associated with sand dunes and wetlands; ecosystem types that have become uncommon due to human activity.*
National Priority 3:	*To protect indigenous vegetation associated with 'originally rare' terrestrial ecosystem types not already covered by priorities 1 and 2.*
National Priority 4:	*To protect habitats of acutely and chronically threatened indigenous species.*

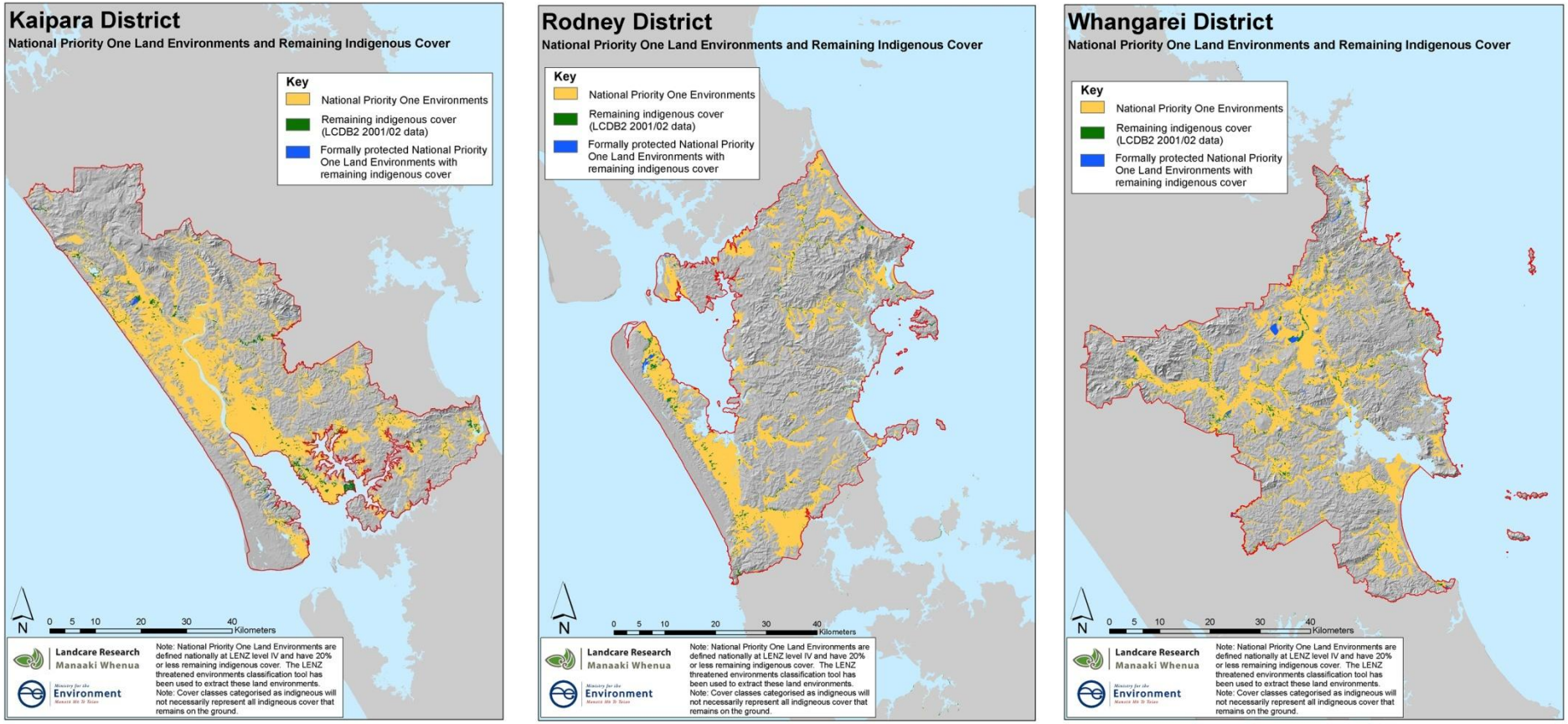
Rare and Threatened biodiversity at a national scale (Figure 8), relevant to the Kaipara, include:

Coastal: • *Active Sand Dunes – North Head to Maunganui Bluff*	*Hilton et al. (2000)*
Wetlands: • *Gumlands* • *Estuarine* • *Ephemeral Wetlands* • *Lake margins*	*http://www.landcareresearch.co.nz/research/ecosystems/rare/ecosys_cat_details.asp?RareEcosys_CatID=6*

National priorities for biodiversity protection across New Zealand will be applied at regional and district government scales to enable a full range of remaining natural habitats and ecosystems to be protected. This perspective will force local and regional councils to consider not only their biodiversity protection but also that of the entire country. However, there is a need for local and regional councils to identify at their scale areas for biodiversity protection because those habitats and ecosystems may have local and regional rare, threatened or valued habitats by that community (MfE 2007f).

Concerns do arise from the lack of a strategic and systematic perspective to biodiversity management, protection and restoration (Peart 2007) by local and regional councils, primarily because the RMA does not promote strategic thinking about the long-term development trajectory of a district or region; and in the absence of a National Policy Statement for Biodiversity making it mandatory for Regional Councils to develop regional biodiversity plans this issue will continue. This problem however, is compounded by the fact that plans covering both public and private landuse (district and regional plans), do not actively promote biodiversity conservation and they lack monitoring to ensure objectives are achieved, and policies and rules are consistently applied (Bellingham 2008).

Figure 8. Kaipara, Rodney and Whangarei District National Priority One Land Environments and Remaining Indigenous Cover.



Territorial Authority Biodiversity Planning & Management

Management of biodiversity or protected natural areas[3] (PNA) is confined to Crown-owned conservation lands, and for local councils, through landuse planning of natural resources, including biodiversity, on all public and private land. In 2003, an amendment to the RMA clarified that managing biodiversity is an explicit function of both regional and district councils and that they must provide for the maintenance of biodiversity in their regional and district plans (Appendix 6).

However, in the continuing absence of a National Biodiversity Policy Statement to guide local efforts, various mechanisms, rules and policy tools exist across the Kaipara Harbour and catchment. District Plans, which are the main mechanism through which development pressures on important biodiversity are managed, are generally weak documents (Bellingham 2008). There is a need for District Plans to achieve national biodiversity conservation goals on private land, including ancestral Māori land, especially when only 23% of New Zealand's original forest cover remains and only 16% of that is managed by the Department of Conservation.

Kaipara District currently has 6,072 Ha of indigenous vegetation in Priority 1 land environments that is not formally protected; Rodney District 3,117 ha and Whangarei District 4,926 Ha (Figure 9) (Walker *et al.* 2005).

The Northland Biodiversity Enhancement Group (Nbeg) reported on a number of priorities and opportunities for biodiversity enhancement and restoration in Northland (New Zealand Landcare Trust 2007) and provided information on statutory and non-statutory mechanisms available to protect and enhance biodiversity in Northland. Summary information is provided in Table 5 and Appendix 6 (biodiversity objectives). Some of the key points made in the report include:

- **Northland Regional Council (NRC) Regional Policy Statement (RPS) 2002** was prepared to achieve the integrated management of Northland's natural and physical resources. It outlines key methodology to achieve objectives for the development, use and protection of these resources that guide the preparation of strategies and plans. The RPS recognises the relationship between soil conservation, land management, and pest management and includes ecosystem and biodiversity objectives. The RPS guides the development of district plans and regional plans. District and regional plans must give effect to the RPS.

  The NRC undertook a five-year review of the efficiency and effectiveness of the RPS (Northland Regional Council 2006). The report identified that ecosystems and biodiversity objectives is a top priority for review. A full review of the RPS will be undertaken in 2009.

[3] A Protected Natural Area (PNA) is a defined area of land that has formal legal status intended to protect ecosystems, vegetation, species or habitats. These include areas administered by the Crown, covenanted land or other protective mechanism (Wildland Consultants 2008).

- **Operative Kaipara District Plan (1997).** The plan was one of the first in New Zealand to be made operative under the RMA. The current District Plan was not based on strong strategic direction (Peart 2007). The orientation of the plan was to encourage development and at the same time broadly reinforce existing settlements.

  As a result of an appeal to the proposed plan by the Department of Conservation and Guardians of the Kaipara Inc., a policy overlay was added to provide special recognition of the Kaipara Harbour environment. The policy overlay provides a lower level of protection than for other coastal areas in the district, based on a lower rating of the natural character of the harbour.

  The provisions of the overlay place extra controls on earthworks and the clearance of indigenous vegetation, and require additional information to be provided when a resource consent application is lodged. They do not, however, place any additional restrictions on subdivision or building development.

  The plan also included a number of significant natural areas (SNAs) that were given some recognition, but minimal protection. The Council have not mentioned their fate and it appears that a number have been partially or wholly cleared (M. Bellingham, pers. comm., Dec 2009).

  KDC released a proposed plan in October 2009 that did not identify Outstanding Natural Landscapes as required under the Northland Regional Policy Statement and the RMA (Beca Carter Hollings & Ferner Ltd (Beca) 2009) . The proposed plan also does not reconcile with the rules identified under the proposed variation to the Rodney District Plan for the creation of a West Coast Rural Policy Zone (Rodney District Council 2009).

  It is notable that pastoral farming and forestry still remains a permitted activity, while a move towards these two activities becoming consented activities are underway in other large rural farming catchments around the country such as Taupo and Manawatu-Palmerston North.

  The operative Kaipara District Plan provides policies and rules relating to clearance of indigenous vegetation and/or wetlands and a criterion for ranking significance of areas of indigenous vegetation and habitat. A register of ecological features is provided in the plan.

  Some mechanisms to support biodiversity include: policies and rules relating to clearance of indigenous vegetation and/or wetlands; objectives and policies relating to significant ecological and natural areas including ranking criteria; rates relief is offered to landowners to protect land under conservation covenants like QEII National Trust and Ngā Whenua Rahui; a Register of Trees of Special Amenity Values (eg. trees that are considered to be of historic, scenic and/or scientific value will be protected under District Plan); financial contribution by resource consent applicants towards the protection and/or enhancement of a significant heritage or nature feature as a condition of landuse consent or subdivision consent including fencing or restoration planting; financial contribution by applicants towards the protection and enhancement of riparian areas as a condition of landuse consent

where habitat or water quality values of adjoining lakes, rivers or coastal waters are likely to be adversely affected by landuse activities.

Unlike the 1997 district plan, the proposed 2009 plan does not identify SNAs, although all of the district had natural areas surveyed (Smale *et al.* 2009) and this information is publically available.

Kaipara District Council Biodiversity Improvement Fund was established in 2005 and provides funding to landowners and community groups that enhance native biodiversity. The Fund currently stands at $15,000 annually but there is support to increase the size of the fund.

- **Proposed RDC District Plan (2000)** in the southern part of the Kaipara Harbour and catchment, the Rodney District Council District Plan rural provisions apply. Unlike the east coast of the District, the District Plan does not specifically recognise the Kaipara Harbour as a coastal environment or provide, (similarly with the Kaipara District Plan), any protective coastal zoning for the land surrounding the harbour. This is because the level of development pressure surrounding the harbour has historically been much less than on the east coast.

Long-term Council Community Plans (LTCCP):

As well as preparing district plans, local councils along with regional councils, are required to develop Longterm Council Community Plans (LTCCPs) under the Local Government Act 2002. These Plans, which have a timeframe of at least 10 years, are intended to provide a longer-term planning framework for councils as well as to promote better alignment between council spending and the achievement of community outcomes. They encompass the social, economic, environmental and cultural aspects of community well-being, therefore embracing a broader sustainable development paradigm than does the RMA (section 10). These well-being objectives feed into local and regional council annual planning frameworks.

There is no direct legislative linkage between the RMA and plans prepared under the Local Government Act, other than the general provision in the RMA requiring councils to have "regard to " management plans and strategies prepared under other Acts (section 74(2)(b)(i)).

However, a proposed West Coast Rural Policy Zone (Rodney District Council 2009) has been developed which addresses these issues for earthworks and vegetation clearance. It does not include forestry or farming activities which will continue to be permitted activities.

Rural provisions only allow subdivision (as a restricted discretionary activity) if an environmental benefit is provided, such as covenanting areas of bush. Where such benefit is not provided, subdivision is a non-complying activity.

Table 5. A summary of specific policy tools & mechanisms utilised by local and central government to implement terrestrial, freshwater & marine biodiversity restoration and protection.

Method	NRC	KDC	RDC	ARC	DoC	Mfish
Register of significant ecological sites		*Not in proposed 2009 plan*				
Vegetation clearance rules						
Criteria for ranking significant areas & habitats				*Outlined in ARPS*		
Subdivision controls						
Conservation covenants						
Assistance to establish QEII covenants						
Rates relief						
Strategies, management plans & agreements	*Community Pest Control Areas*				*Conservation Management Strategies*	
Education & advice to landowners				*Natural Heritage staff*		
Direct funding for protecting biodiversity on private land	*Environment Fund*	*Biodiversity Improvement Fund*	*Natural Heritage Fund*	*Environment Fund & Coastal Enhancement Fund*	*(see Table 6)*	
Direct funding to protect biodiversity in marine environment						
Information/websites				*www.arc.govt.nz*	*TFBIS*[4]	*NABIS*[5]
Regional Biodiversity Forums	*Nbeg*				*Nbeg*	

[4] TFBIS = Terrestrial Freshwater Biodiversity Information System (http://www.biodiversity.govt.nz/land/nzbs/tfbis/tfbis/index.html)
[5] NABIS = National Aquatic Biodiversity Information System (http://www.nabis.govt.nz/Pages/default.aspx)

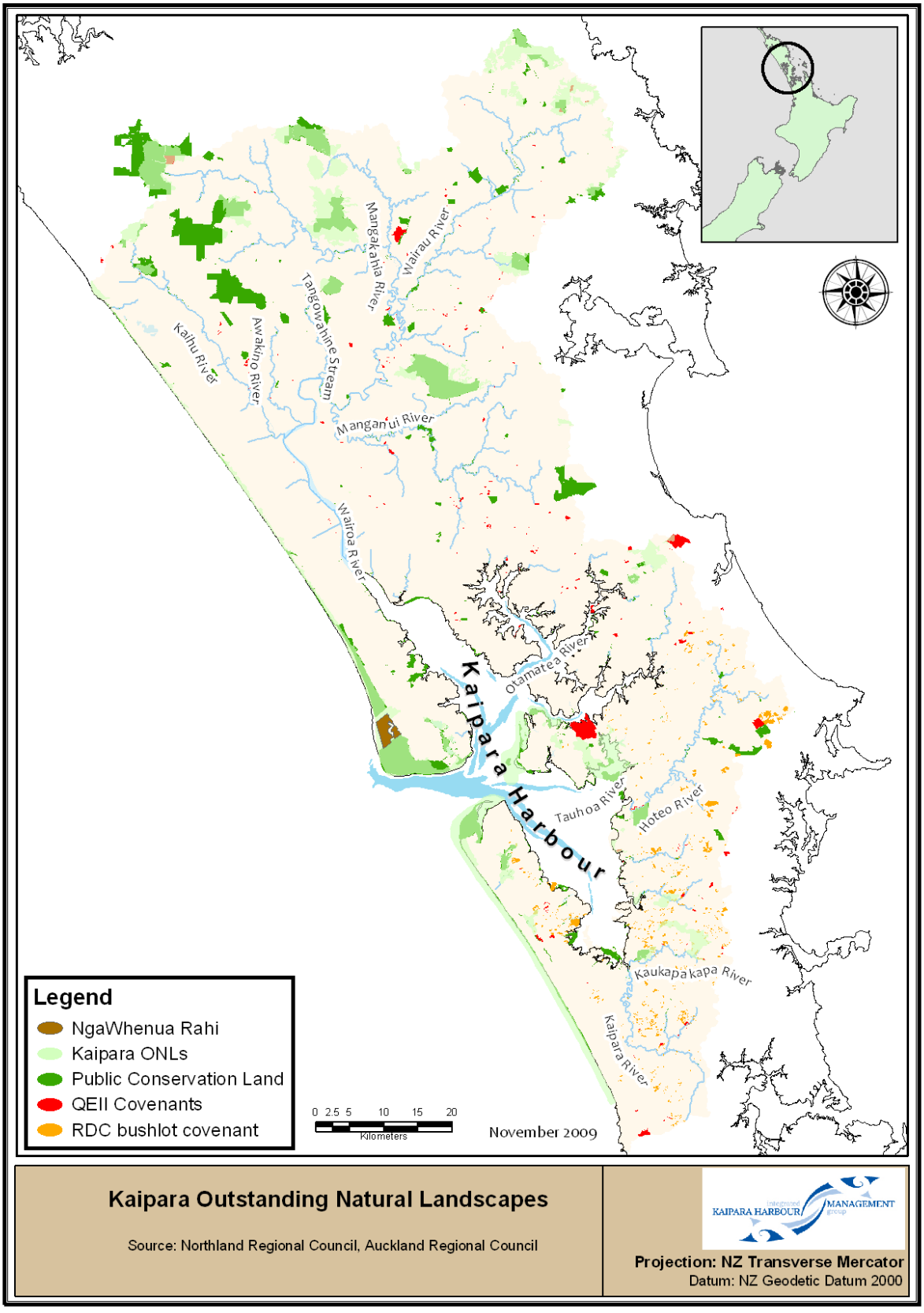
14.7.1 IDENTIFICATION OF PROTECTED AREAS FOR BIODIVERSITY PERSISTENCE

To carry out assessments that would lead to achieving s6(c) and (b) of the RMA regarding protection of outstanding natural landscapes (ONLS) (Figure 9) and features, including significant indigenous vegetation, habitats and fauna, has been problematic (Peart 2004). A comprehensive and systematic approach to identifying outstanding natural features and landscapes, significant indigenous vegetation and habitats of indigenous fauna throughout the Kaipara Harbour and catchment; and to a lesser extent an agreement on how they should be identified, is yet to be developed. And as emphasised by the Environment Court:

> '*If the areas of outstanding natural landscapes cannot be identified then how can objectives and policies (and methods) be properly stated for them?*' (paragraph 97, C180/99; Peart 2004).

There is no overall protection strategy for terrestrial biodiversity in the Kaipara catchment. In the absence of a National Biodiversity Policy that would identify the process to restore and protect biodiversity, reference to the New Zealand Biodiversity Strategy (NZBS) (DoC 2000) is considered when understanding the management of Kaipara's biodiversity. The NZBS has a national perspective and postdates the Protected Natural Area Program, Natural Heritage Fund establishment and the Conservation Management Strategies; and sets a long-term direction for biodiversity protection in New Zealand. The goals of the NZBS are outlined in Appendix 8.

Figure 9. Northland and Auckland Region Outstanding Natural Landscapes found in the Kaipara catchment and harbour.



Both the Northland and Auckland Regional Policy Statement identify Outstanding Natural Landscapes and Features (Auckland only, for the volcanic cones) (Figure 9). Kaipara and Rodney District Councils are required to give effect to the RPS and the identified s6(b) and (c). To date, little effort has been directed at implementing policy around Outstanding Natural Features and Landscapes in Northland Region (NRC 2006) compared to the Auckland region.

There are however, a Conservation Management Strategy (CMS) that encompasses the northern Kaipara (Department of Conservation 1999) and another that encompasses the southern Kaipara (Department of Conservation 1995); each implemented by Northland and Auckland conservancies', respectively. The two conservancies are currently working together to develop and review their new CMS which will hopefully lead to integration of biodiversity restoration and protection for the Kaipara. These strategies try to outline the Departments strategic direction for ecosystem protection for a ten-year period. The strategy identifies areas critical to maintaining the ecological integrity of existing protected areas. Areas can be adjacent to or in the vicinity of ecological "hotspots" throughout the region identified by the Department. Criteria used include:

Criteria	**Explanation**
Nature Heritage Fund	Representativeness Sustainability Landscape Integrity Amenity, utility
Ecological District priorities	Representativeness Distinctiveness
Conservation Management Strategy priorities	Representativeness Sustainability Landscape integrity

In 2001, there was an attempt to develop a restoration and protection strategy for Northland. The Nature Heritage Fund Committee commissioned a report to undertake a qualitative approach to identify protection and restoration priorities of indigenous ecosystems in the Northland Conservancy (Conning 2001). Criteria used for the assessment included: a) Nature Heritage Fund criteria (b) Protected Natural Area Program criteria (Appendix 2), and (c) Northland Conservation Management Strategy.

Highly Protected Natural Areas

Protected Natural Areas (PNA) are afforded protection under (see Table 6):

- DoC public conservation land
- Queen Elizabeth II National Trust (QEII) Covenants
- Ngā Whenua Rahui
- Whangarei District Covenants
- Conservation Covenants

- Rodney District Protected Natural Areas

In total, 12% of the Kaipara catchment has some sort of legal protection particularly aimed at conserving natural values (see Table 7 Chapter 9 Protecting & Restoring Native Biodiversity) (Figure 10). This is approximately 38,497 Ha. An extra 5,277 Ha, or 1.6%, may protect natural values as a by-product of protection but that is not the purpose of the reserve or protected area (eg. RDC Covenant bushlot or Auckland Regional Park). A majority of the PNAs, 8.9%, are under the governance and management of the Department of Conservation. The next largest protector of land is the Pouto Rural Fire Service (5,481 Ha, probably has biodiversity values protected as a by-product); followed by the Queen Elizabeth II National Trust protects the next largest share of land (3,041 Ha).

Different legislation afford different levels of protection to natural values. Some Acts of legislation, or sections, have a primary purpose to protect natural values and features within a PNA (Wildland Consultants 2008). This includes reserves under the Conservation Act, Ngā Whenua Rahui Kawenata, Government Purpose (Wildlife) Reserve under the Reserves Act, and Nature Reserves under the Reserves Act.

There are four categories of legal protection where natural values will be protected and the primary aim is usually the protection of these natural values/features. They are:

1. Conservation Covenant (Reserves Act)
2. Protected Private Land (Reserves Act)
3. Scientific Reserve (Reserves Act)
4. QEII covenants (Queen Elizabeth II National Trust Act 1977)

Local Purpose Reserve and Scenic Reserve under the Reserves Act not always have the primary purpose of protecting natural features/values and hence, they are not a PNA. Some of the purposes are for esplanade or landing reserves, building sites, and quarries. The detailed analysis of these types of reserves was outside the scope of this report but requires analysis to understand the depth of PNAs in the Kaipara landscape and seascape.

Other mechanisms available that are not mandated to establish ‘areas’ for the protection of biodiversity are listed in Table 7.

Marine Highly Protected Areas of the Kaipara
Currently there are no marine highly protected areas in the Kaipara established under the Marine Reserves Act or implemented under the Marine Protected Areas Policy and Implementation Plan 2008.

Other Data Gaps
Data used to estimate PNAs in the Kaipara was incomplete. Datasets which that were not yet available at the time of writing and analysis were for the Tokatoka and Tangihua Ecological District.

Figure 10. Kaipara catchment protected area network

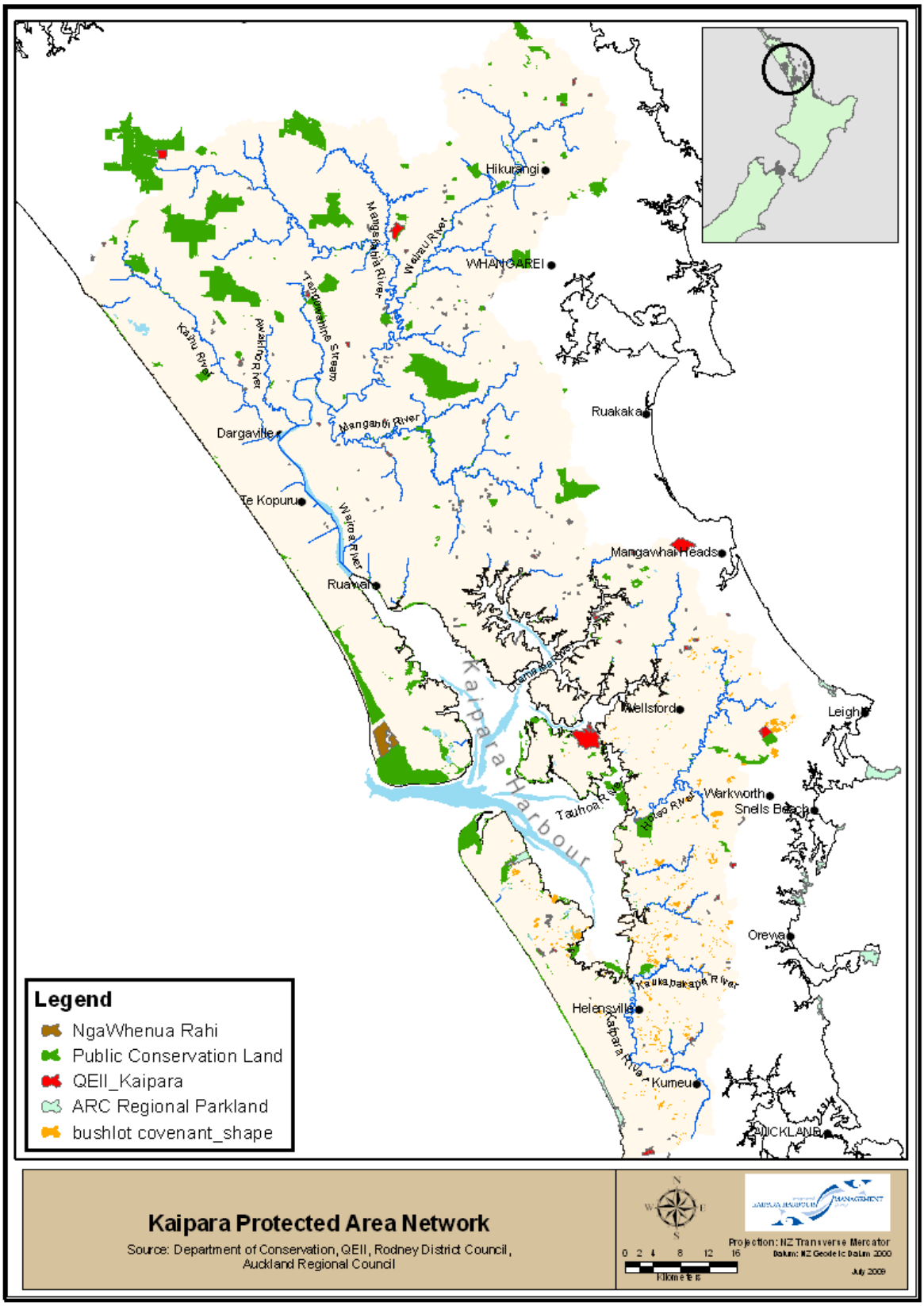


Table 6. Regulatory and non-regulatory frameworks dedicated areas for purposes of biodiversity or natural area protection.

District Council	Department of Conservation	Non-Regulatory Mechanisms
Whangarei District Council covenant Rodney District Council covenant	*Conservation Act 1987:* • Wildlife Management Reserve • Conservation Park • Marginal Strip • Sanctuary Area • Stewardship Land *Reserves Act:* • Government Purpose (Wildlife) Reserve • Wildlife Refuge • Nature Reserve • Scientific Reserve • Protected Private Land • Scenic Reserve *Marine Reserves Act:* • Marine Reserve *National Parks Act 1980:* • National Park	QEII Covenants Ngā Whenua Rahui Natural Heritage Fund Wetlands of International Importance (Ramsar Convention)

Table 7. . Regulatory and non-regulatory frameworks where the mandate is not to establish 'areas' for persistence of biodiversity and natural values

Auckland Regional Policy Statement	**Auckland Regional Plan: Coastal**	**Rodney District Plan**	**Northland Regional Coastal Plan**	**Northland Regional Policy Statement**	**Kaipara District Plan:**	**Non-Regulatory Authority:**
Outstanding Natural Landscapes Regional Parks	Coastal Protection Areas 1 and 2	Protected Natural Areas	Marine 1 (Protection) – areas of important conservation value Marine 2 (Conservation) – everything not included in other zones	Outstanding Natural Landscapes	Biodiversity Improvement Fund	New Zealand Fish & Game Wetland
Foreshore & Seabed Reserve Historic Reserve				Community Pest Control Area Foreshore & Seabed Reserve Historic Reserve		

14.8 SUSTAINABLE MANAGEMENT

The concept of sustainability has been around for centuries and has appeared in ancient Greek literature proving unsustainable practices were recognised early in western civilisation. The World Commission on Environment and Development re-introduced the concept defining it as

> *"…meeting the needs of the present generation without compromising the ability of future generations to meet their own needs".*

14.8.1 FISHERIES

Like all of New Zealand, commercial fishing in the Kaipara is regulated using output controls under the Quota Management System (QMS) and the *Fisheries Act 1996*. This system determines how much fish and what species that each company or independent operator is entitled to catch. This is known as Individual Transferable Quota (ITQ). Such quotas provide the right in perpetuity to harvest a Total Allowable Commercial Catch for a stock of fish in the QMS. Stocks are defined as Quota Management Areas (see Figure 4) and are generally very large and basically coincide with the spatial distribution of a genetically defined stock. Once a QMA is established, it can only be changed with the agreement of the owners of at least 75% of the affected QMA, or if the Minister is satisfied that it is necessary to ensure sustainability.

Discussed in more detail in Chapter 10, there is evidence of an increasing problem with fish stocks within the harbour, especially as an increasing percentage of the commercial catches within QMA are coming from the Kaipara. Little scientific information is available on the status of stocks especially the size of the stock. It is unknown whether they are at a sustainable level to commercially fish and also handle the pressure of recreational and customary fishing. Assessments are undertaken mainly using a measure of Catch Per Unit Effort (CPUE). The assumption of this measure is that, if fishers are able to catch at least the same amount of fish over a time period using the same effort, the stock size is likely to be stable. However, the problem with CPUE measure is that it does not take into account change in equipment technology (e.g. use of GPS, sounders) and fishing methods. If fishing becomes more efficient, the stock could be in decline, but show a stable CPUE.

This is of particular concern to Māori, who have indicated that they do not feel able to exercise their customary fishing rights. Under the Te Uri O Hau Deed of Settlement the Ministry of Fisheries is required to consult with the hapū and iwi of the harbour. In a low income area such as the Kaipara, the state of the local fisheries is of significant concern to the community.

Current management issues

Kaipara fisheries hold a deep and rich history for Kaipara iwi/hapū and community. Hence, fisheries management is a significant management objective for the IKHMG. One of the

issues preventing the integration and co-operative management of fisheries in the Kaipara harbour is the lack of any provision to provide for locally managed fisheries (Peart 2007). The *Fisheries Act 1996* does not provide for this opportunity due to the philosophy underpinning the QMS; being based on QMA scales which apparently mirror species distribution patterns. Fishing effort was supposed to be spatially-dispersed throughout these QMAs to conserve stocks, but in situations such as the Kaipara it has not necessarily worked.

An attempt to address some of these issues came through the drafting of the North West Finfish Plan (Ministry of Fisheries 2009a), however with restructuring of the Ministry in late 2009 the plan has been abandoned for a new fisheries planning process that is conducated at a national scale.

Other issues the Kaipara Harbour Sustainable Fisheries Management Study Group (KHSFMSG 2003) and Peart (2007) identified include:

- Lack of sufficient ecological information on state of fish and invertebrate stocks.
- Substantial knowledge gaps of how land-based impacts affect coastal fisheries, in particular through mechanisms of sedimentation.
- Lack of effective coastal resolution process to address high levels of conflict.

14.8.2 RESOURCE USE & DEVELOPMENT

The *Resource Management Act 1991* (RMA) has brought all land-use activities, both public and private, under the development control process of the Act. The only land-use not subject to the RMA is land-use on land under the *Conservation Act 1987* and Ministry of Defence lands. The RMA is not a conservation Act but promotes sustainable management, which is defined in Section 5. In other words, the RMA requires management of these natural and physical resources in a way that promotes the purposes of the Act. The RMA provides a sustainability framework for a more holistic approach to resource management and replaced a large number of overlapping and inconsistent legislation. The RMA shifts planning from central to local government, placing almost all activities, including those activities conducted by central government under the scrutiny of the Act and it shifted the focus of environmental planning agencies to that of regulatory bodies, rather than agencies promoting development.

Even though the RMA has certainly improved on previous planning legislation in terms of biodiversity protection, the application of the RMA has proved limited in its ability to halt the decline of biodiversity, protect natural resources, intrinsic values, and ecosystems. The utilisation of natural resources still appears to take precedence (even when this appears to be unsustainable); opportunities to practice kaitiakitanga remain limited (Chetham 1998); and an integrated and holistic management framework that is pro-active and not issue- or effects-based focused is missing (Murray & Swaffield 2000, Peart 2007, Bellingham 2008). On this issue, the Horizons Regional Council (Manawatu-Whanganui) has addressed this

issue through the development of a One Plan[6] that incorporates the Regional Policy Statement and Regional Plans for land-use, biodiversity, water, land, air, coastal marine area, and discharge.

Challenges facing Kaipara and Rodney District Councils relating to the RMA and coastal management are outlined by Peart (2007). To summarise, they include lack of a strategic focus to planning under the Act, the site-specific focus which the Environment Court has adopted in applying it, the imbalance in council resources and budgets across the Kaipara land and sea, and the ongoing challenge to make plan changes.

Some of this has come from the interpretation of the Act especially s.5 (2). Lately, the courts have interpreted sustainable management as an "overall judgment approach", rather than a 'balancing' approach from the TCPA or 'environmental bottom-line' approach. Using this 'overall' approach to sustainable management, even if a development proposal fails to meet one or more of the requirements of s.5 (a-c), it may still be deemed to constitute sustainable management, particularly if it generates substantial positive benefits (Peart 2004).

Current Management Issues

Issues facing sustainable coastal and terrestrial development and resource use in the Kaipara are:

- Lack of a strategic perspective to address long-term development and growth, particularly the lack of a growth strategy for Northland and a sustainable development strategy for the Kaipara coastal marine area and land. Very little specific information relating to development in the Kaipara, notably the lack of monitoring of subdivisions by the Kaipara District Council.
- Strong focus on site-specific issues rather than a strategic regional and national focus and effects on natural resources and biodiversity.
- Conservation lot provisions are an undermining strategy to concentrate development (Peart 2007).
- Opportunities are lacking to allow the practice of kaitiakitanga and other Mātauranga Māori principles, in the resource management regime of the Kaipara. This issue is explored in more detail in Chapter 11 'Restoring the Mauri'.
- Lack of priority given to the Kaipara Harbour and its tributaries resulting in weak coastal development controls, particularly in the Kaipara District compared to the Rodney District.
- Lack of integration of district plan provisions governing land development around the Kaipara Harbour and tributaries.
- Lack of addressing diffuse or non-point source pollution from intensive land-use runoff from pastoral farming and forestry (Peart 2007, MfE 2007). The past decade

[6] http://www.horizons.govt.nz/default.aspx?pageid=170

has seen a significant intensification of land use, particularly pastoral land use across the Kaipara catchment.

Greater emphasis needed on stream bank planting, nutrient budgeting and exclusion of stock from waterways through bridging and fencing.

- Addressing conflicting uses and increasing competition for resources as the population continues to grow throughout the Kaipara catchment and coastal area. This is a difficult challenge for regulatory authorities as they try to balance the competing needs and values of Kaipara natural resources.

14.8.3 WATER QUALITY & SEDIMENTATION

Management of suitable water quality and sedimentation is provided for under the RMA. The RMA controls activities, which result in land-based sediment entering waterways and coastal-marine environment. The major sources of sediment runoff entering the harbour are through land practices, such as removal of vegetation and forests, grazing and earthworks. Like most other catchments in New Zealand, significant land clearing and other modifications to the land have occurred. In 1984, it was estimated that 43% of wildlife habitat in Northland had either been reduced in area or totally lost between 1978 and 1983.

The Auckland Regional Council (ARC) commissioned research in 1994 to review the contribution of sediment from various land-use types (Auckland Regional Council 2001, 2001a). The research indicated that earthworks had the potential to produce over 100-fold more than other types of land-use, such as pastoral and residential (Table 8).

Table 8. Annual soil loss in the Auckland region (Source: Peart 2007, ARC 2001)

Landuse	Predicted average annual soil loss (over 20 years) (tonnes/km^2/yr)
Earthworks	16,800
Developed Urban – industrial use	100
Developed Urban – residential use	24
Pasture	46
Market gardening	52

There is no doubt that the removal of scrublands (e.g. manuka, kanuka and fern bush) and forest (e.g. kauri and broadleaf-podocarp forests) has had severe consequences for the Kaipara estuarine environment. Soil erosion has accelerated, directly leading to sedimentation of the harbour and is believed to have altered community structure of marine habitats (Gibbs & Hewitt 2004). Peart's (2007) review of sedimentation management in the Kaipara Harbour explains some of the current weaknesses in the legislation and policy. The key issues facing sedimentation management in the Kaipara are:

- Lack of cost-effective technologies to effectively remove sediment run-off
- Little control over cumulative impacts of minor earthworks

- Historical reluctance to regulate rural activities, such as grazing and forestry harvesting, resulting in weak controls/rules
- Lack of catchment-level focus when considering resource consent applications.
- Poor linkages between catchment management & the ecological carrying capacity of the recipient marine area.
- Cumbersome plan change procedures.

Sediment Controls

Kaipara District Council (KDC) rules for earthworks in the Kaipara Harbour Environment Area (KHEA) policy area have been developed from a natural character perspective and recognise effects of earthworks for surface area and cut/fill rather than volume. The KDC rules have a 1000m^2 'threshold', where consent is required for earthworks involving significant new tracking or roading, and a 2m high cut/fill 'threshold' as a length component.

In recognition of the need to protect the harbours and estuaries from sedimentation, Rodney District Council (RDC) has subdivision incentives in General Rural Zones which are provided for land retirement and rehabilitation. The incentive applies to steep land and includes areas near the Hoteo River which drain to the Kaipara Harbour. Earthwork controls for Landscape Protection Zones are more stringent than the General Rural Zone in the Rodney District. Rules on native vegetation clearance are also less stringent in the Rural Zone.

Monitoring of these earthworks consent conditions is sparse, with minimum checking and quantitative monitoring regimes in place by both RDC and KDC. There is currently insufficient baseline information for sedimentation monitoring to be able to directly correlate areas where sedimentation is a problem in the Kaipara harbour and to ascertain where consent conditions are not effective. In recognition of these issues, RDC are re-examining, earthwork controls in the Rural Zone for areas of native vegetation, subdivision, vegetation removal, and proximity to wetlands as part of the Proposed District Plan. Opportunities exist here to strengthen existing provisions to develop more consistent subdivision provisions and monitoring regimes across the harbour.

Plantation Forestry Controls

Plantation forestry harvesting can expose the soil, resulting in erosion of hillslopes and ridges allowing sediments to flow into downstream freshwater (Table 9) and marine habitats (Table 10) (Harding *et al.* 2000; Gibbs 2004; Gibbs & Hewitt 2004). Most forestry plantations are composed of *Pinus radiata,* pine, as they grow quickly and produce timber that slot readily into a processing and retailing market. Much of the existing plantation forest established in the 1970s and 1980s involved planting to the stream edge (van Roon & Knight 2004, Peart 2007).

Table 9. Examples of common effects of forestry activities on stream habitats. (Source: Harding et al 2000, p. 247).

Effect	Physical Response	Invertebrate Response
Loss of riparian canopy	Increased light reaching the stream; increased water temperatures	Shift in invertebrate community to grazer and piercer taxa; shift in food use by some taxa.
Sedimentation	Increased sediment load; decreased substrate size; reduced habitat complexity and a reduction in places to hide	Fewer invertebrate grazers, environmental stress, predation & more floods
Change in water quality	Addition of forestry related pollutants, such as, pesticides and herbicides; increased surface and groundwater ions	Decrease in invertebrate abundance and diversity; increase in algal growth
Decrease organic matter	Decrease in leaf and wood litter over long-term	Decrease abundance of habitat, invertebrate shredders and filter feeders.
Change in water flow	Increased water yield, flow and faster runoff rates	Invertebrate abundance decreases by high flows

Table 10. Examples of common effects of sedimentation on marine habitats, particularly macro-invertebrate communities. (Source Gibbs & Hewitt 2004, Morrison et al. 2009)

Effect	Physical Response	Macro-invertebrate Response
Death	Increased suspended sediment concentrations & nutrients in water column; decrease in oxygen & BOD. Increase level of hydrogen ions, lowering of pH; toxicity effects.	Clogging of gills, reduction in foraging ability and efficiencies, feed availability, leading to chronic impacts such as physiological stress and reduced growth & feeding rates and reproductive fitness.
Loss of nursery habitat	Abrasion and scouring by soil particles generated by waves and tides.	Loss of biogenic habitat, loss of prey; structured complexity decreases. Decrease in available "attachment" habitat, particularly for seaweed/kelp, seagrass spores and mussel spat.
Decreased light	Change in light regimes and	Increase in algal growth.

Effect	Physical Response	Macro-invertebrate Response
attenuation	water temperatures. Decrease in water clarity.	Change in primary production of pelagic phytoplankton and benthic microphytes[7]. Seaweed distribution change
Physiological stress	Increases in turbidity levels or suspended sediment concentrations; changes in salinity	Reduced growth rates. Reduced pumping rates, rejecting excess filter material as pseudofaeces, decreased energy returns. Change in blood physiology, gill structure, increased respiration rates in fish, and coughing.
Substrate composition	Change in biogeochemistry of seafloor. Increase in ammoniacal nitrogen, reduction in exchange of water across sediment-water interface. Oxygen depletion. Increased mud, clay and silt content in seafloor sediment.	Change in pelagic & benthic primary production. Change in distribution of infaunal and epibenthic species. Change in abundance of species and number of animals within each species. Change in assemblage structure. Change in animal communities.
Behavioural		Alarm reaction, abandonment of cover, avoidance response, impaired homing.
Habitat degradation	Sediment trapped, especially if habitat not exposed directly to open sea physical processes, such as waves and large tidal regimes.	Increased degradation to habitat of macro-invertebrates, particularly bivalves.
Trophic level changes	Reduced flow, change in salinity, pH, turbidity	Trophic linkages change to primary or secondary production from addition of nutrients; trophic level composition and biomass changes.

[7] Animals that live in or on sediments.

Controls over sedimentation resulting from harvesting of plantation forests are not generally strong (Peart 2007), and for the case of the Kaipara, rules appear to be stronger in the North compared to the Auckland region (Table 9). In the Auckland region, vegetation removal is a permitted activity (as long as activity complies with environmental standards in the Sediment Plan, and in Northland, it is a permitted and discretionary activity.

Environment Waikato has gone one step further to control sedimentation, particularly in sensitive and highly valued catchments, such as the Coromandel Peninsula. Environment Waikato has rules surrounding protecting riparian areas, clearance on hillslopes exceeding 20 degrees, and making forestry a controlled activity where vegetation clearance exceeds 50 hectares per annum.

Table 11. Regional Council rules to address sedimentation and water quality issues for Plantation Forestry activities.

Regional Council	Rules
Auckland	Permitted Activity - *If complies with environmental standards in Sediment Plan*
Northland	Permitted Activity - *If complies with environmental standards in Sediment Plan* Discretionary Activity - *If trees were planted after Plan became operative in August 2004;* - *If within 5 metres of a water body;* - *If within 5 metres coastal marine area*

Agriculture Controls

Farming is a permitted activity in the Kaipara catchment, with the Northland region having slightly stronger controls than Auckland (Table 12). Northland Regional Council has also offered some voluntary mechanisms to reduce sedimentation, through the use of an environment fund for fencing water bodies preventing stock accessing the foreshore and waterways. Auckland Region currently has no controls over grazing, farm diary effluent, vegetation clearance and stock access to riparian areas or waterways (Peart 2007).

Table 12. Regional Council rules to address sedimentation and water quality issues for agriculture activities.

Regional Council	Rules
Auckland	No applicable rules
Northland	Permitted activity - *If meets environment standards are met*.

Pastoral farming continues to be the leading landuse in Northland (Northland Regional Council 2007f) and consequently in the Kaipara catchment. The first pastoral farming started in 1897 and has developed exponentially since then (Table 13). There has been a movement away from beef and sheep farming to an intensification of dairy farming, which is a consistent pattern occurring across New Zealand, with an increase of 24% in the ten years from 1996 to 2006 (Fonterra *et al.* 2006, 2008). A similar increasing trend is being seen in fertiliser use, with a 113% increase across New Zealand in total fertiliser application for the period 1986 to 2002 (Statistics NZ 2006). Dairying farms require significantly more fertiliser than any other type of landuse because, dairy farming involves intensive grazing to produce milk at optimum levels. Good pasture must be rich in nutrients to produce milk at this level. Northland, along with the Waikato, Canterbury, Otago, Manawatu-Wanganui region, has the highest application rate of urea, DAP and lime, at a rate of 431-883kg/ha (Statistics NZ 2006). The Auckland region has one of the lowest rates of fertiliser use possibly reflecting the small area of rural land in intensive dairying and horticulture in the region.

Table 13. Dairy Cows between 1897 to 1946. (Source: Ryburn 1997).

Year	Hobson County (northern Kaipara)	Ōtamatea County (Eastern Kaipara)	Rodney County (southern Kaipara)
1897	1,837	1,926	2,920
1901	3,263	2,119	2,820
1906	3,283	3,007	5,262
1910	4,804	6,608	5,807
1921	12,600	11,000	8,300
1926	16,000	13,000	11,000
1931	24,400	21,500	17,200
1936	33,000	28,500	25,000
1941	34,000	30,000	26,000
1946	32,300	29,200	25,000

14.9 CURRENT & PROPOSED INITIATIVES

Integrated Kaipara Harbour Management (IKHM) Project

Described in more detail in Chapter 5 'Purpose and Vision', the Integrated Kaipara Harbour Management (IKHM) Project is an iwi-led initiative to move towards an integrated, co-operative managed Kaipara Harbour - Ngāti Whatua most sacred taonga. Founded on the principles of both Mātauranga Māori and western management, the project vision is to achieve a 'healthy and productive Kaipara Harbour'.

A Terms of Reference (ToR) has been adopted (July 2009) by the Integrated Kaipara Harbour Management Group (IKHMG), whom co-ordinate the project, and outlines the key responsibilities of parties to the IKHMG to deliver on the outcomes of the IKHM Project.

Primary Sector Water Partnership (PSWP) Project: Hoteo River

The Hoteo River was nominated to the Primary Sector Water Partnership Project, by the Auckland Regional Council after input from the regional community and the IKHMG. This catchment-based initiative by the Primary Sector, addresses water quality issues originating from productive land use.

The Hoteo River catchment was nominated because it met particular criteria. They are: (a) there is significant water quality or water quantity issues in the catchment, (b) good baseline information available, (c) range of land use, and (d) catchment were PSWP can add value through any initiatives.

The Auckland Regional Council (ARC) is leading this project with the support of the local community and the IKHMG. This is a three year project with the final design of the program is still being developed which is guided by key principles. They are: (a) promotes best practice, (b) adaptive management, (c) on-farm decisions, catchment outcomes, (d) achieving the right mix of voluntary measures, incentives, audited self-management, and regulation that will result in the desired outcomes for water management in the catchment; and (e) to the best of our knowledge, understanding the problem is a prerequisite to effective management.

NIWA-NRC-ARC-Ministry of Fisheries Research Alliance

This alliance was built out of the need to address integrated research and monitoring of the Kaipara ecosystems. A research advisory group with representatives of ARC, NRC and NIWA focus on key environmental management issues in the Kaipara for Northland and Auckland Regional Councils. Currently, there are no representatives from Kaipara iwi/hapū organisations so allow Mātauranga Māori principles are also utilised to develop research and monitoring priorities for the Kaipara.

Some of the key research and monitoring initiatives that have been identified to date include:

- Holistic marine monitoring of Kaipara Harbour, predominantly of water quality and benthic 'health'. 16 sites are proposed for a baseline program to start in 2010. A Benthic Health approach rather than Tier 1 marine ecological monitoring to occur in the southern Kaipara Harbour and to also be implemented in 2010/11.

- Sediment Accumulation Rates (SAR) will be determined to understand sediment patterns over time periods greater than 25 years. Often sedimentation effects are captured in stratified sediment layers which can be used to calculate SAR. Core sampling will be undertaken across intertidal mudflats within the Kaipara Harbour and estuarine environment. NIWA, the team being lead by Dr Swales, will use pollen, caesium-137, lead-210, Zinc (Zn) and sediment particle size to determine SAR in the mudflats.

- Spatial and temporal sediment patterns within the Harbour. This project will use stable isotope techniques to track the movement of terrestrial sediments throughout the Kaipara Harbour intertidal and subtidal areas. This technique can assist with estimating the % terrigenous clay in estuarine sediments. The ARC are also

planning automated sampling stations to record sediment loads for all major inflows to southern Kaipara Harbour. The final monitoring is still being developed

- Freshwater flow monitoring within the Hoteo and Makarau Rivers.

- Foundation of Research, Science and Technology (FRST) research program Clean Water Productive Land, and Effects-Based Protection and Management of Aquatic Ecosystems. Both proposed programs involve the Kaipara estuarine and catchment ecosystems. The final comprehensive research proposal is due to FRST in March 2010 with funding being received in October 2010.

Rodney District Rural Strategy

The Rodney District Council is the regulatory authority for the southern Kaipara catchment and with 92% of the District with some sort of rural zone, the development and subsequent implementation of this Rural Strategy will play a key role in the future of landuse and development occurring in the Kaipara catchment. A Discussion Paper (Rodney District Council 2009a) and background research on lifestyle preferences of rural landowners, rural economy and rural landscapes (Rodney District Council 2008b; Buckland 2009), has been completed for the development of a Rural Strategy. The Discussion Paper outlines the main rural issues and options for addressing and evaluating those issues required for the Rural Strategy.

The purpose of the Rural Strategy will be to, in the long-term (25 years), protect and enhance rural landscapes and character; foster a sustainable rural economy; protect cultural values and future benefits of unbuilt areas and open space; manage settlement edges and 'green belts' and; improve rural development outcomes for communities and the environment.

Some of the key issues identified for the Rural Strategy include: subdivision opportunities in rural areas to avoid adverse effects; the trade-offs of subdivision for bushlot covenants and environmental benefits is questionable; need to address the pressure and changes in the rural economy; the dispersion of rural development and the lack of key settlement focus areas and; the ability to achieve good development outcomes for rural landscapes, water quality, biodiversity and coastal amenity.

Proposed West Coast Rural Policy Area

Good initiative to address the importance and significance of the Kaipara coastal environment to Rodney District and to maintain and enhance the special characteristics and values of the Kaipara.

The West Coast Rural Policy Area is introduced over the General Rural Zone to the west coast of the Kaipara Harbour coast and South Head.

Within the Area certain provisions apply to buildings, earthworks, wetland/watercourse modification and vegetation clearance. A controlled activity status is applied to buildings and

structures within the Area and there will be more stringent activity thresholds applied to earthworks, vegetation removal and wetland/watercourse modification.

It is considered the proposed variation is necessary to protect and enhance the natural and physical values of the area from growth pressure apparent due to its proximity to metropolitan Auckland, particularly the need for coastal/rural residential development (Rodney District Council 2009).

Rules or controls (i.e. Rule 7.9.2, Rule 7.9.4.1.9, Rule 7.9.4.2.2, Rule 7.9.4.3.1, Rule 7.15.3 and Rule 7.11.3) will include buildings scale, form and location. Earthworks will be controlled in terms of quantity (m^3), area (m^2) and erosion and sediment runoff controls; extent and location of building; design and location of buildings; landscape and reinstatement measures; protection of significant natural features such as trees, bush, waterways and landforms and features identified as significant natural areas (SNAs) on the Planning Maps (Rule 7.11.3).

It is believed that the variation will provide for section 6 of the RMA 1991, in preserving the natural character of the coastal environment, wetlands, lakes, rivers and their margins and protect outstanding natural features and landscapes from inappropriate subdivision, use and development.

The variation does not include pastoral farming or forestry activity, and it is unclear how it will protect indigenous vegetation and habitats, significant representative landforms and geological features. It was also unclear to what extent the incorporation of Mātauranga Māori principles was used in this policy development and planning.

14.10 GAPS & OPPORTUNITIES FOR INTEGRATED CO-MANAGEMENT OF KAIPARA HARBOUR, CATCHMENT & ECOSYSTEMS

The Kaipara Harbour and catchment has a complex environmental management structure.

Management by multiple authorities has resulted in a plethora of western legislation, polices and planning instruments with little use of traditional (Mātauranga Māori) management. This has created conflicting management philosophies, conflicting management scales and a highly fragmented legislative framework.

The main regulatory agencies are: Auckland Regional Council, Northland Regional Council, Kaipara District Council, Whangarei District Council, Rodney District Council; Northland Conservancy, Department of Conservation, Auckland Conservancy, Department of Conservation; and the Ministry of Fisheries.

Te Iwi o Ngāti Whatua hapū hold mana whenua and mana moana status for the Kaipara Harbour and catchment. Te Roroa, Te Parawhau, Ngāpuhi and Ngāti Hine hold mana whenua in the northern parts of the catchment. Te Kawerau a Maki hold mana whenua status over part of the south-western catchment which encompasses the foothills of the Waitakere Ranges to Taupaki.

Key issues are encapsulated in two broad areas: (1) number of regulatory agencies; and (2) existing environmental issues, namely, declining fish stocks, environmental effects of fishing, increasing, land-based derived sedimentation and declining water quality; increasing resource use and development; unhealthy mauri; loss of biodiversity.

Biodiversity management objectives in local and regional council statutory planning documents are comprehensive and provide scope for protecting and restoring indigenous biodiversity. However, problems were identified with implementation in district plans arising from planners not making full use of the available information base, a lack of monitoring and, failures by planners and ecologists to properly understand and communicate information for effective district planning. The majority of biodiversity protection and restoration is voluntary without any clear leadership or national policy directions to halt the decline of biodiversity across all ecosystems within the Kaipara land and seascapes.

These investigations illustrated that the integrated, co-management initiatives of the IKHMG is hindered due to the lack of any statutory framework in which to ground them. Co-management and integrated management is justified under both the RMA and the Conservation Act but very rarely occurs. The prospect for integration to occur between Kaipara and Rodney District Council planning for coastal development looks bleak as they both take different approaches (Peart 2007, Kirchberg 2007). To then integrate fisheries planning, marine protection planning and regional coastal planning poses a greater challenge to address a truly integrated management approach for the Kaipara ecosystems (see Figure 3 which illustrates the concept).

General understandings of important knowledge and management gaps gathered from this information review are listed below. A prioritisation exercise was undertaken by the IKHMG at a workshop convened on 18th February 2010. Top priority gaps and opportunities that

were confirmed at the workshop are outlined first followed by other gaps and opportunities identified from the analysis.

14.10.1 TOP PRIORITY GAPS & OPPORTUNITIES

14.10.1.1 DEVELOP A KAIPARA BIODIVERSITY POLICY STATEMENT

The substantial loss and ongoing decline of biodiversity has resulted in fragmented and highly stressed examples of ecosystems within the Kaipara land and seascape. There is currently no systematic planning approach to biodiversity protection and restoration across all ecosystems. It remains ad hoc without a National Policy Statement to guide Councils and relies on 'feel-good' voluntary mechanisms and private landowners education. There is very little use of technology, integrated datasets and decision-support tools to prioritise the use of minimal resources allocated to biodiversity protection and restoration at both a local and regional scale. Monitoring of biodiversity across the land and sea of the Kaipara varies between minimal to none. The protection of what remains in these fragments is essential to halt the decline of indigenous biodiversity.

The five year review of the New Zealand Biodiversity Strategy indicates that important building blocks are needed to achieve the objectives stated in the New Zealand Biodiversity Strategy (Green & Clarkson 2005). This included: (a) Oceans Policy to clarify; (b) inter alia, governance and management responsibilities for marine biodiversity; (c) National Policy Statement on Biodiversity and; (d) indicators for biodiversity and biosecurity, linked to regional and national monitoring and reporting systems which would satisfy a comprehensive state of the environment reporting system.

In the absence of a National Biodiversity Policy Statement an opportunity exists for the IKHMG to develop a statement or guideline for the Kaipara catchment, harbour and ecosystems. Such a policy statement could provide for:

- A clear statement of purpose of managing outstanding landscapes and the outcomes to be achieved;
- Include a definition of 'cultural' landscape as well as 'natural' landscape, so providing clearer scope for cultural landscapes.
- Strengthening terrestrial landscape protection and identification of Outstanding Natural Landscapes using quantitative approach rather than subjective approach using spatial decision-support tools and analysis;
- Requirement of regional policy statements and district plans also carry out spatial identification analysis, and describe the ecological, social and cultural values to be protected for each area, under sections 6 and 7 of the RMA;
- Compatibility assessment of activities in each outstanding landscape in terms of s6(b)[8].

[8] See Peart (2004), Appendix 7, for a more legal opinion on the scope of a national policy statement under the RMA.

- Best practice guidelines for local government on biodiversity conservation and restoration strategies in district planning; and landscape assessments and incorporation into policy. Within the guidelines quantifiable targets should be established to achieve biodiversity restoration and protection, to allow a comprehensive monitoring and reporting system to exist and which evaluates progress.
- The policy needs to include consideration of the impacts of climate change on biodiversity, which is predicted to cause significant species loss (Green & Clarkson 2005).
- There are currently no marine protected areas in the Kaipara Harbour to protect marine ecosystems that contribute to the persistence of marine biodiversity. The coastal-marine environment of the Kaipara falls under the jurisdiction and protection of the Northland and Auckland Regional Councils as it is within 12nm boundary. There are reserves that occur along the coastal mean high water spring margin that have been established under the Reserves Act or the Conservation Act. However, these reserves have not been established to deliver on restoring or protecting marine biodiversity.

14.10.1.2 PROMOTE INTEGRATED LAND (CATCHMENT) - SEA MANAGEMENT

Particular attention should be given to the following opportunities to promote integrated land (catchment)-sea management:

- **Integrate land-sea planning at compatible scales.** Joint planning of the land (catchment) and coastal marine environment. This includes fisheries plans, iwi management plans, Long-term Community Council Plan, district and regional plans. Using the Kaipara Atlas integrated database and spatial decision-support tools develop an integrated plan that embodies the objectives and principles of the IKHM project. Within the landscape address priorities for protection particularly indigenous forest habitat, threatened environments, by recognising contiguous areas, compact areas in preference to narrow elongate areas, restoring vegetation around remnant to increase its compactness and; ensuring protected areas are fenced from farm animals and kept free of pests & weeds.

  A systematic approach is recommended, founded on principles such as, comprehensiveness, adequacy, persistence, and efficiency; with a transparent, iterative cost-effective process that encompasses delivery on biodiversity restoration, maintenance, protection; reduction in land-use activities effects on fisheries habitats; and protection and restoration of mauri.

  Integrated planning should also be supported by:

  - **Integrated, across-agency monitoring and research programs:** With limited coastal ecological monitoring sites in the Kaipara Harbour (one site within Auckland Region and three in Northland Region of Kaipara Harbour) that operate under two separate regulatory agency with varying policy, resources and

budgets, the ecological understanding of the health and integrity of the Kaipara Harbour ecosystems is lacking.

- A joint Northland-Auckland **coastal monitoring program** requires development to move towards integrated management and planning of the Kaipara Harbour.
- A joint Northland-Auckland **rivers monitoring program** requires development to move towards integrated management and planning of the Kaipara Harbour. This should be supported by the development of catchment-specific water quality guidelines rather than the currently used ANZECC guidelines, which are non-regional and apply across New Zealand and Australia.
- A Ngāti Whatua ki Kaipara hapū **cultural health index** to monitor the health of mauri.
- **Integrated, across-agency water allocation and use.** As water demand increases with changing landuses, particularly increasing dairy farming and lifestyle blocks, understanding the spatial and temporal patterns of supply are necessary to secure freshwater resources for competing needs. The catchment needs to be the fundamental management unit when allocating water. Freshwater budgets for some catchments, especially those in high-use and when water is scarce, needs investigation so to preserve other uses of water such as: lake, river and stream ecosystems; intrinsic values; public use of lake, rivers and streams; water for stock (which does not require a resource consent), and water required for diluting pollutants and those preserving its assimilative capacity.

  Balancing the competing needs will become increasingly important and with the pattern of rainfall in New Zealand expected to change in the future due to climate change, allocation/quantity (user pays) which operates under the RMA (1991) as first−come, first−served may become inefficient. The question of quality (polluter pays) may become part of the solution to address such changes. Investigations of pricing water is not a new concept and is carried out in several countries around the World (e.g., Australia). Pricing could also be used to address the quality problem. For example, the right to discharge nitrogen into certain waterways or lakes could be capped and traded in appropriate units. The New Zealand Business Council for Sustainable Development (NZBCSD 2008[9]) report on New Zealand's freshwater proposes integrated catchment management plans and caps on contaminants allowed into waterways.

  The NZBCSD (2009) recent survey of over 2,500 New Zealanders across gender, ethnicity, age, income, employment and party vote 2008 concluded that 77% of respondents believed polluters should pay for their own emission costs rather than the government (15% of respondents) or taxpayers (3% respondents).

- **Appropriately designed mechanisms to monitor plan implementation.** Little attention has been made by regional and district councils and crown agencies to

[9] http://www.nzbcsd.org.nz/water/NZBCSD_Best_Use_Solution_Full_Report_27Aug08.pdf

monitor plan implementation. This does not include central government monitoring of administrative progress of regional and district planning. There is a very limited body of research on plan implementation for the Kaipara, such as, monitoring the actual outcomes, or use conditions, of the plan compared to the desired outcomes. Monitoring and reporting should include:

- Biodiversity values and sites in the district and regional land and seascape
- Cumulative effects of changes in plans over their 10-year life
- Effects of consent approvals that depart from policy, controls/rules and outcomes (i.e. more than 90% of consents are non-notified, as plan administrators decide that effects are no more than minor (Ministry for the Environment 2007g))
- Plan outcomes over the 10-year life
- Analysis of existing data sources (e.g. resource consent monitoring conditions and reporting data)

- Co-governance structure that will provide one set of rules for the entire harbour and catchment.

- The IKHMG to promote cohesion and achieve the long-term objectives.

14.10.1.3 PROMOTE CO-MANAGEMENT INITIATIVES

Co-management partnership initiatives that will achieve the long-term objectives of the IKHM project are outlined in the following opportunities:

- In association with farmers, develop **best practice guidelines for sustainable land practices** within the catchment, found on up to date knowledge and innovation development. Reference given to key impediments, incentives and trade-offs for different farm management strategies; fertiliser use and irrigation of high-producing pastures; freshwater/waterways protection including gully networks; soil ecosystem protection and sustainability.

- **Ecosystem monitoring partnerships** between agencies, iwi/hapū, research agencies and community. With many benefits stemming from community participation in monitoring, such as education, understanding of issues and scientific methodology, ecology; such a partnership would pool resources, expertise and advice allowing monitoring to expand into areas that are currently lacking, such as, freshwater fauna and habitat; marine-coastal habitats; and status of mauri.

- **Restoration programs developed by stakeholders, landowners, hapū, community groups, and government organisations.** Proactive restoration action is lacking for the Kaipara therefore, presenting an opportunity for a co-management partnership to facilitate action in this direction. Findings from this analysis strongly

highlight the poor health of the Kaipara natural ecosystems, which consequently impacts on the functions and services they provide.

Data currently exists on the location of our most highly stressed ecosystems, and a network of ecosystems that require management effort to restore the function and structure of these ecosystems. Some data pinpoints particular streams, rivers, lakes, wetlands and sub-catchments.

A suite of integrated tools, using both a 'carrot and stick' approach, should be outlined in development of restoration programs. Clear, specific and agreed objectives need to be identified. The suite of tools would differ across varying scales of implementation from sub-catchment, coastline, upper estuarine areas, open coast, lake catchment and river-stream network.

14.10.2 OTHER GAPS & OPPORTUNITIES IDENTIFIED

Science & Research

- **Lack of empirical data/evidence.** When managing Kaipara ecosystems, including physical processes (e.g. erosion processes, sand movement, invasion pathways), resource use and development, regional, central and district planning generally tends to operate on minimal information derived from the planning area (Bellingham 2008, Peart 2007). A concerning theme occurring throughout current planning documents, is the absence of supporting empirical data at appropriate scales, both in time and space. For example, the state of the environment reporting sampling regime is established at both a regional and national scale. However, when planning for a particular local area due to increased growth (e.g. Tinopai, Maungaturoto) or pressures (e.g. climate change, localised fish stock depletion, coastal subdivision development and subsequent growth) the scale of the regime do not adequately characterise the status of the area ((Ericksen *et al.* 2004; Laurian *et al.* 2004).

  There is little (no) support or professional development to close this gap between ecologists and planners. Decision-support tools are virtually non-existent in planning and management of the Kaipara, especially tools that are spatially enabled.

- **Very little local and regional studies of recreational use of the harbour, coast, lakes, wetlands and other waterways**. There has been an outdoor recreational studies carried out in 1970 (Auckland conservancy) particularly related to use of Auckland coastline and marine areas and for the Kaipara-Kumeu River. There is a great deal known about the use of New Zealand rivers by industry (e.g. agricultural and power generation) very little is known regarding the spatial and temporal recreational use of these same waterways, coasts and sea.

- **Addressing sedimentation and pollution of freshwater waterways, including wetlands, and estuarine ecosystems.** Identifying potential 'hotspot' areas of pollution by sediments and other contaminants like phosphates, nitrogen and pesticide residues

(e.g. dioxins, mercury, dieldrin), require management action that can provide a relative improvement in water quality and productive land. Understanding spatial and temporal (so to capture flooding events), past and current (and future), patterns of sedimentation and pollution by contaminants such as the above-mentioned, is a gap for the Kaipara harbour and catchment. More specifically, to address the intensification of pastoral farming and reduce pollution of the Kaipara ecosystems, appropriate quantitative end-of-catchment targets (e.g. tones per year or tones per cubic kilometer of average annual discharge of water from the river) for particular contaminants such as total suspended sediment, total nitrogen, total phosphorous and some pesticide residues, need to be developed based on current and new data sources. Secondly, understanding which sub-catchments are most at ecological risk; building on the rare and threatened environments identified at the Territorial Authority scale and applying an understanding of spatial and temporal patterns of pollution. Difficulties may arise due to the lack of "near natural" or undisturbed catchments that reflect natural circumstances. This development will become speculative as we try to understand what is the acceptable level of pollution that will allow ecosystems persistence and services.

Thirdly, a picture of erosion rate, including sediment delivery and transport relationships, of sub-catchments is beginning through the development of NZeem for and SedNet models for New Zealand. Such models perform best with the most appropriate empirical data, and for the Kaipara, this is a gap.

Models and tools such as SedNet/ANNEX used overseas to assist with managing sediment runoff and eutrophication, for example, the Great Barrier Reef catchments; showed that an overwhelming majority of sediment and nutrient supplied to the Great Barrier Reef originates within 80-90 km of the coast in areas from landscapes with high rainfall and steep slopes that are used for grazing or intensive agriculture (e.g. sugarcane). Further inland, particulate nutrient loads dominant but these loads are, for all practical purposes, deposited on flood plains, river beds and in reservoirs and therefore do not reach the coast in a reasonable timeframe (Cogle *et al* 2006).

For any particular catchment, effective management of sediment and nutrient loads may require separate strategies. Strategies to manage particulate nutrient loads have little effect on dissolved nutrient loads and vice versa. Management strategies targeting improved vegetation (ground) cover in grazing lands delivered the greatest reductions in sediment and particulate nutrient loads. Implementation of best management practice (fertiliser application and tillage methods) produced the greatest reduction in dissolved nutrient loads for intensive agricultural systems. (Cogle *et al* 2006).

From the evidence collected for this review, it appears that patterns of sediment and/or pollution differ across the entire Kaipara catchment and within its subcatchments. Spatial modeling across the entire catchment will be the most effective way to understand these patterns.

14.11 BIBLIOGRAPHY

Auckland Regional Council (2001). Kaipara River Catchment water allocation strategy. Auckland, Auckland Regional Council.

Auckland Regional Council (2001a). Auckland Regional Plan: sediment control., Auckland Regional Council.

Beca Carter Hollings & Ferner Ltd (Beca) (2009) Proposed Kaipara District Plan: Section 32 Evaluation Summary Report. Prepared for Kaipara District Council. 74.

Beever, J. (1981). "A map of the pre-European vegetation of Lower Northland, New Zealand." New Zealand Journal of Botany **19**(1): 105-110.

Bellingham, M. (2008). Does District Planning under the Resource Management Act 1991 Protect Biodiversity? Planning. Auckland, University of Auckland**:** 231.

Blackhurst, M., M. Day, T. Warren, N. Ericksen, J. Crawford & S. Chapman (2003) Iwi interests and the RMA: An evaluation of Iwi and Hapu participation in the resource consents processes of six district councils. Hamilton, NZ. University of Waikato, Hamilton: The International Global Change Institute (IGCI).

Buckland, M. (2009) Draft Landscape Analysis of Rural Rodney. Rodney District Council Rural Strategy. March 2009. 92.

Chetham, J. (1998). Kaitiakitanga and the Resource Management Act: Tangata Whenua, Participation, and Morality. Department of Geography. Auckland, NZ, University of Auckland. **MSc:** 122.

Conning, L. (2001) Northland Protection Strategy. A Report to the Nature Hertiage Fund Committee. Published by the Nature Heritage Fund. Wellington, NZ. 134.

Department of Conservation (1995). Auckland Conservancy. Conservation Management Strategy (1995-2005).

Department of Conservation (1999). Conservation Management Strategy. Northland Conservancy. 1999-2009. Volume One. 297.

Department of Conservation (2000). The New Zealand Biodiversity Strategy. Our Chance to Turn the Tide. *Whakakohukihukitia Te Tai Roroku Ki Te Tai Oranga.* 146.

Department of Conservation (2008). Proposed New Zealand Coastal Policy Statement 2008, Department of Conservation. 35.

Department of Conservation & Ministry of Fisheries (2006). Marine Protected Areas. Policy and Implementation Plan. 25.

Durie, M. H. (2001). Mauri Ora: The dynamics of Maori health. Auckland: , Oxford University Press.

Ericksen, N. J., P. Berke, J. Crawford & J. Dixon (2004). Plan-making for sustainability: the New Zealand experience. Hamilton, New Zealand, International Global Change Institute, University of Waikato.

Fonterra, Ministry for the Environment, Ministry of Agriculture and Forestry & Local Government NZ (2006) The Dairying and Clean Streams Accord: Snapshot of Progress - 2006/2007. Wellington, NZ. 8.

Fonterra, Ministry for the Environment, Ministry of Agriculture and Forestry & Local Government NZ (2008) The Dairying and Clean Streams Accord: Snapshot of Progress - 2006/2007. Wellington, NZ. 8.

Gibbs, M. (2004) Relating terrigenous sediment deposition in Mahurangi Harbour to specific landuse in the catchment: a pilot study. Auckland. Auckland Regional Council. 42.

Gibbs, M. & J. E. Hewitt (2004) Effects of Sedimentation on macrofaunal communities: a synthesis of research studies for ARC. Prepared for ARC. NIWA Client Report HAM2004-060. Technical Publication No. 264. Auckland, NZ. ARC. 54.

Green, W. & B. Clarkson (2005) Turning the Tide? A Review of the First Five Years of the New Zealand Biodiversity Strategy, The Synthesis Report. Wellington,. Biodiversity Chief Executives. 52.

Halkett, J. (1991). The Native Forests of New Zealand. Wellington, GP Publishers.

Harding, J. S., J. M. Quinn & C. W. Hickey (2000). Effects of mining and production forestry on stream invertebrates. New Zealand Stream Invertebrates: Ecology and Implications for Management. K. J. Collier & M. J. Winterbourn. Christchurch, Caxton, New Zealand Limnological Society.

Hitchmough, R., L. Bull & P. Cromarty (2005). New Zealand Threat Classification System Lists 2005, Department of Conservation. 134.

Jefferies, R., T. Warren, P. Berke, S. Chapman, J. Crawford, N. Ericksen & G. Mason (2002) Iwi interests and the RMA: An evaluation of the quality of first generation council plans. Māori Working Paper No. 1. Hamilton, NZ. Kōkōmuka Consultancy Ltd, International Global Change Institute, The University of Waikato. 34.

Kaipara District Council (2009a). Chapter 15A Maori Purposes. Proposed Kaipara District Plan October 2009., Kaipara District Council.

KHSFMSG (2003). Fishing for the future – a strategy for the fisheries of the Kaipara Harbour. Prepared by Kaipara Harbour Sustainable Fisheries Management Study Group. (Unpublished report, held by the Ministry of Fisheries, Auckland).

Kirchberg, A. (2007) Kaipara harbour coastal environment policy review. Auckland. Auckland Regional Council. 60.

Laurian, L., M. Day, M. Backhurst, P. Berke, N. Ericksen, J. Crawford, J. Dixon & S. Chapman (2004). "What drives plan implementation? Plans, planning agencies and developers." Journal of Environmental Planning and Management **47**(4): 555 - 577.

Leathwick, J. R., G. Wilson, D. Rutledge, F. Morgan, K. Johnston & M. McLeod (2002). Land environments of New Zealand. Nga Taiao o Aotearoa. Technical Guide. Wellington, NZ, Ministry of Environment.

Leathwick, J. R., G. Wilson, D. Rutledge, P. Wardle, F. Morgan, K. Johnston, M. McLeod & R. Kirkpatrick (2003). Land environments New Zealand. Auckland, NZ, David Bateman.

Ministerial Review Panel (2009). Pākia ki uta pākia ki tai Summary Report of the Ministerial Review Panel. Ministerial Review of the Foreshore and Seabed Act 2004., NZ Government. 18.

Ministry for the Environment (2001a) Towards a National Policy Statement on Biodiversity. Preliminary Wording (for initial discussion purposes only). May 2001. Wellington, NZ. Ministry for the Environment. 25.

Ministry for the Environment (2007). Environment New Zealand 2007. 460.

Ministry for the Environment (2007g) Resource Management Act: Key Facts About Local Authorities & Resource Consents in 2005/2006. Wellington, NZ. Ministry for the Environment. 67.

Ministry for the Environment & Department of Conservation (2007f) Protecting Our Places. Information about the Statement of National Priorities for Protecting Rare and Threatened Biodiversity on Private Land. Wellington, NZ. Ministry for the Environment. 57.

Ministry of Fisheries (2009). Fisheries 2030. New Zealanders maximising benefits from the use of fisheries within environmental limits. 15.

Ministry of Fisheries (2009a) Draft North Island West Coast Finfish Fisheries Plan. Summary Document. Auckland, New Zealand. Ministry of Fisheries. 16.

Murray, J. & S. R. Swaffield (2000). Myths for environmental management: a review of the Resource Management Act. Environmental Planning and Management in New Zealand (2nd Ed.). A. Memon & H. C. Perkins. Palmerston North, New Zealand, Dunmore Press**:** 74-79.

Murton, B. (unpublished). Kaipara Harbour Report (Draft). Chapters I-VII.

New Zealand Landcare Trust (2007) Towards a Strategic Direction for Biodiversity Enhancement. The Whole of Northland Project. 72.

Northland Regional Council (2006) Regional Policy Statement - Efficiency and Effectiveness Review. Whangarei, NZ. Northland Regional Council. 84.

Northland Regional Council (2007e) State of Environment Report. Biodiversity. Whangarei, NZ. Northland Regional Council. 41.

Northland Regional Council (2007f) State of Environment Report. Land and Soils. 45.

Ogle, C. C. (1982) Wildlife and wildlife values of Northland. 272.

Organisation for Economic Co-operation and Development (2007). OECD environmental performance reviews: New Zealand. Paris, France, OECD.

Peart, R. (2004). A Place to Stand. The protection of New Zealand's natural and cultural landscapes. Auckland, NZ, Environmental Defence Society Incorporated.

Peart, R. (2005). Looking Out to Sea. New Zealand as a model of ocean governance. Auckland, NZ, Environmental Defence Society Inc.

Peart, R. (2007). Beyond the Tide. Integrating the management of New Zealand's coasts. Auckland, NZ, Environmental Defence Society.

Pond, W. (1997) The Land With All Woods and Water, Rangahaua Whanui National Theme U. Wellington, NZ. Waitangi Tribunal.

Rodney District Council (2008b) Rodney District Residential Dwelling Capacity. Exercise 1:Rural Capacity Study. Orewa, NZ. Rodney District Council. 34.

Rodney District Council (2009). Rodney District Proposed District Plan 2000 - Proposed Variation 132 Introduction of a 'West Coast Rural Policy Area'. Rodney District Council. 9.

Rodney District Council (2009a) Rodney District Council Rural Strategy Summary Background Issues Paper, October 2009. Orewa, NZ. Rodney District Council. 67.

Ryburn, W. R. (1997). Tall spars, gum and steamers: the European settlement and economic development of the Kaipara District 1854-1948. MA Thesis. History. Auckland, University of Auckland. **MA:** 356.

Smale, M. C., B. R. Clarkson, B. D. Clarkson, C. G. Floyd, T. S. Cornes, R. M. Clarkson, D. C. Gilmour, T. M. Snell & C. M. Briggs (2009) Natural areas of Kaipara ecological district (Northland Conservancy). Reconnaissance survey report for the Protected Natural Areas Program. Report prepared by Landcare Research New Zealand and The University of Waikato. Department of Conservation. 391.

Statistics NZ (2006) Fertiliser Use and the Environment. Statistics New Zealand. 13.

Stirling, B. (1996) The Lands of Te Uri O Hau O Te Wahapu O Kaipara. Volume One - The Nineteenth Century. The Evidence of Bruce Stirling. 244.

Stirling, B. (1998). Ngati Whatua Native Land Court block histories, 1864-1900: the evidence. [New Zealand], B. Stirling.

Te Roroa Whatu Ora Trust (2008) Nga Ture mo Te Taiao o Te Roroa. Te Roroa Iwi Environmental Policy Document. Draft. 2008. 44.

van Roon, M. & S. Knight (2004). Ecological Context of Development. New Zealand Perspectives., Oxford University Press.

Waitangi Tribunal (1992) Te Roroa Report 1992. Waitangi Tribunal. 150.

Walker, S., R. Price & D. Rutledge (2005) New Zealands's remaining indigenous cover: recent changes and biodiversity protection needs. Prepared for Department of Conservation by Landcare Research. 81.

Wildland Consultants (2008) Protected Natural Areas in Northland, and Care Standards for Protected Natural Areas. Report No. 1844. Prepared for Northland Regional Council. Rotorua, NZ. 70.

Williams, D. A. R. (1997). Environmental and Resource Management Law in New Zealand, 2nd edn. Wellington, NZ, Butterworths.

Williams, P. A., S. Wiser, B. Clarkson & M. C. Stanley (2007). "New Zealand's historically rare terrestrial ecosystems set in a physical and physiognomic framework." NZ J Ecology **31**(2): 119-128.