DOUBTLESS BAY MARINE PROTECTION GROUP
Te Roopu Whakahauora o Tokerau

DISCUSSION DOCUMENT

COMMUNITY
MARINE MANAGEMENT PLAN

August 2005

Prepared by

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For

Doubtless Bay Marine Protection Group and the Far North Environment Centre

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MIHI

(NEED THIS DONE)

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Photo Credits

Cover – Fish, Orca, *Ecklonia* (Dr Roger Grace), NZ Dotterel (Detlef Davies), Karikari Moana, boat fishing, workshop (Leane Makey), Kina barren (Andre Kunz).

PURPOSE OF THIS DISCUSSION DOCUMENT

The purpose of this Discussion Document is to seek views and input on the Doubtless Bay Marine Protection Group (DBMPG) community marine management plan. This plan will encompass Doubtless Bay, Mangonui estuary, Taipa estuary, Aurere/Awapoko estuary, Karikari Peninsula and offshore areas; and associated catchments. This document outlines a set of recommendations for marine management in this area.

This document is for discussion, comment and to promote input. It does not commit the Doubtless Bay Marine Protection Group or other interested parties to any action.

Community input and support are vital to the success of this Plan and a public consultation process will be implemented to achieve this.

STRUCTURE OF THIS DOCUMENT

This Discussion Document provides background information on five key issues plus ecological, socio-economic and cultural information.

The *Issues and Proposed Actions* section outlines key actions proposed by the Group for each of the five issues.

HAVE YOUR SAY

Please submit your comments by XXXXXX to XXXXXX.

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DOUBTLESS BAY MARINE PROTECTION GROUP

The Doubtless Bay Marine Protection Group (DBMPG) is a community-based group and over the past three years there has been consensus that something is seriously wrong with our marine environment.

The Group recognises the following problems with our local marine environment:

- There is virtually no local management or control of our marine environment
- The Quota Management System implemented to preserve fish stocks is failing the total ecosystem
- Some fishing methods are severely detrimental to our local fishery, for example, gill netting and commercial trawling.
- Land catchment management directly affects the water quality of our streams, rivers, harbours and sea. For example, sedimentation within our estuaries, faecal contamination of estuaries and beaches is affecting shellfish gathering and swimming. Scientific reports have found that 95% of New Zealand's lowland rivers are not fit to swim in and nitrogen fertiliser application to land has increased by 160% in just a few years.
- Fish, shellfish and crayfish stocks are well down on several generations ago.
- Biodiversity has declined particularly for top trophic level feeders such as packhorse crayfish and kingfish. There are increases in the number of kina barrens where kelp forests have been reduced to rock desert. The main cause is a severe reduction in top trophic level feeders, such as snapper and crayfish that kept the ecosystem balanced by consuming kina. The kelp forests were the nurseries for young fish and paua. As kina barrens expand, the population of paua, juvenile fish and crayfish have been seen to decrease.
- There are few marine educational opportunities for our young people and community. The closest untouched and natural example of our marine environment is the Cape Rodney to Okakari Point (Leigh) marine reserve and offshore at the Poor Knights Islands marine reserve.

In order to reverse this trend, the Group has three main objectives:

- *To raise public awareness about our marine environment;*
- *To have representatives from all local community groups and hapu, in order to work together to protect and restore our marine environment and;*
- *To prepare an overall community management plan for the Doubtless Bay/ Tokerau area which is owned and operated by the local community.*

To do this the community needs to work together. That is maori, pakeha, mokopuna, fisherman, conservationists, landholders and business owners have to have a shared vision for our local marine environment.

We don't have to start from scratch……We can look at other management plans and take the best for our area. The Group is looking at a broad range of community-based management options from Fisheries Act provisions, such as mataitai, to ecological based options under the Marine Reserves Act and also a local voluntary fishing code of practice.

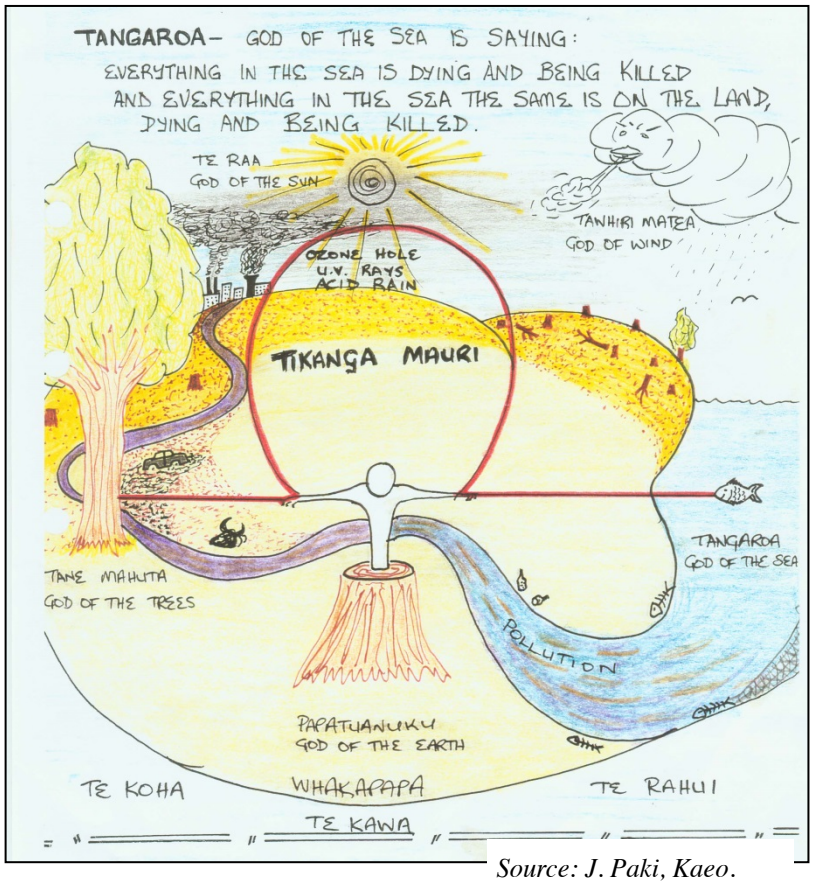
The Group invites….
Everyone to comment and provide input. The Group also invites interested persons/parties and specialists to provide input. We look forward to seeing you at our upcoming meetings.

OUR PHILOSOPHY & GUIDING PRINCIPLES

The Doubtless Bay Marine Protection Group (DBMPG) has always been an open forum for discussion on both direct and indirect (eg. land practices) marine issues. The Group has had members with all backgrounds, from landholders, fishers, and environmentalists to teachers. The Group wishes to be community-based and represent the majority of the community that are directly involved with the marine environment.

The Group is open and transparent in its operations and past and present participants receive minutes of meetings, notices of workshops and other Group events.

The Group is about sustainable management, conservation and working with hapu. The Group wishes to be fully involved, in a participatory fashion, with the management of the marine environment.



Source: J. Paki, Kaeo.

Restoring the *mauri*, the life force, to the marine environment is the Groups main thinking. Restoring the *mauri* is about returning the connection between human and the environment. A balance is needed to begin the restoration. A balance using all types of marine management tools from no-take marine reserves, to rahui, and mataitai. This is a holistic approach to management, moving away from a non-integrated, manipulative system to one that is integrated, collaborative, adaptive and where ecosystem processes must be protected above all other values. The Group recognises that everyone has "rights" and restoring the *mauri* is a right, just like fishing or owning a gun.

Another term used with this type of philosophy is *ecosystem-based management*[1]. This type of management essentially reverses the order of management priorities so that management starts with the ecosystem rather than a target species (Pikitch et al 2004; Smyth et al 2003). Fisheries scientists across the globe are advocating

[1] Basic Principles of ecosystem-based management are: (1) Holisitc, cumulative, and integrated science; (2) Adaptive Management; (3) Collaborative decision-making – ecological, political, generational and cultural expertise, and (4) Socially defined goals included but not protected above all else; the ecosystem is (Symth et al 2003).

this type of fisheries management in order to ensure long-lasting sustainability, and places paramount importance on the overall health of ecosystems.

Ecosystem-based management is a new approach to looking after the environment. It is a rejection of the old management systems based on boundaries drawn from politics, fishing practices or other lines of convenience and sectoral influences. In their place it establishes management systems that recognise, respect and protect biological diversity and the functions and dynamic processes of natural ecosystems.

Ecosystem-based management has not been recognised in any current New Zealand marine legislation, strategic plans and co-management agreements. The RMA could be viewed as providing legal weight to this process and would be part of the "ecology" circle in Figure 1, but the RMA does not extend to the EEZ.

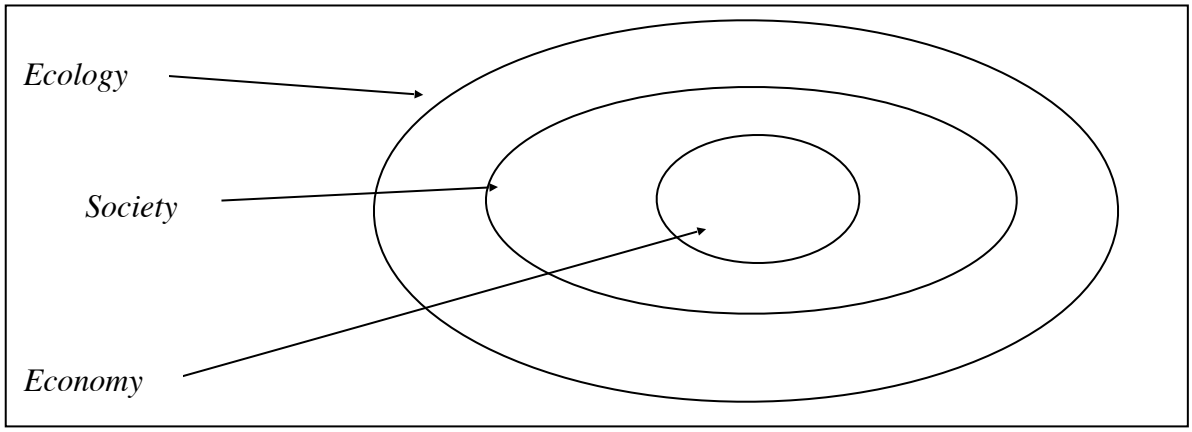


Figure 1. A simple model outlining how ecosystem-based management works where all decisions are being

Customary Rights

The Group recognises that hapu have mana moana and mana whenua. As ancestral kaitiaki, iwi, hapu, and whanau have customary rights to utilise marine resources. While all New Zealanders have a stewardship interest in the marine environment, tangata whenua are kaitiaki for the marine environment and resources, are responsible to past and future generations for sustaining and protecting these taonga.

Traditional and customary management practices of tangata whenua area based on tikanga and the accumulated knowledge of many generations yet are continually evolving.

Privlege or Duty verus Rights

Commercial (fisheries) property rights currently dominants New Zealand's marine management. The Quota Management System (QMS) established this property right situation. There is no doubt that the QMS is an improvement on previous systems that tried to control harvest levels by limiting the number of fishers, types of gear or fishing seasons. However, the Group believes that the mix of commercial property rights with a "public good" framework does not

work. For example, protection of areas of the coast using for example no-take areas or mataitai, constrains access to quota, and without compensation, can result in conflict, and most likely expensive litigation.

More and more intense debates about rights arise between people who have an interest in the marine environment. A right is oriented toward the benefit of current users; the right to harvest marine resources, rights guaranteed to tangata whenua, citizen rights, the rights of future generations, and the intrinsic rights of the environment and its components. The difference to RIGHT is DUTY. Duty is oriented toward future generations and forms some of the underlining principles of *kaitaikitanga*. The Group respects people's arguments of rights, but will focus on the principle of Duty: duty to manage the resource for future generations and that to use or harvest marine resources is a privilege rather than a right.

"Keep the Bakery Going" – Protection and Sustainble Use

The Group recognises the complex, wild, mobile, and large nature of the sea. Not many New Zealand people visit the depths of the sea to explore and look, so we don't see the damage that is being done.

We have become a society that is quicker and cleverer at pulling things out of the sea (fish, shellfish, sand, oil, gas) and throwing things in it (sewage, rubbish, oil spills, runoff) than we are at understanding what's going on in it (Ballantine 1991).

The Group wishes to focus more on keeping the bakery going rather than on "sharing out the cake". A balance needs to be restored to ensure the natural integrity of the marine environment exists. Maintenance of the status quo is the focus of sustainable use management and is different to protection. The QMS and the *Resource Management Act* (RMA) utilise sustainable management principles and dominants marine management. However, do they ensure that resources are sustained in the long term? Despite initiatives, despite the science and improvements and the property rights incentives there are still threats.

The Group believes both protection and sustainable use principles have a role in management of New Zealand's marine environment.

Summary of Our Guiding Principles

To summarise, we used the following principles to help us guide our decisions on our proposals for community marine management. We also used the best possible information available to guide us, which is found in the following sections under *Cultural Significance of the Area; Ecological Characteristics of the Area, and Socio-Economic Description of the Area*.

Guiding principles area:

a. Community driven management of the marine environment – using legal, maori tikanga, and nonlegal (voluntary and/or community arrangements) means.

b. Kaitaikitanga in action – maori *tikanga* (customs and protocols)

c. Connectivity between land and sea (restoring the *mauri*)

d. Protection and sustainable use principles - balance of take and no-take – begin to put effort into restoring and less on taking; "keep the bakery going" rather than focus on sharing out the pie.

e. Future generations – our *mokopuna.*

OUR VISION

A vision to clearly outline the Groups desires for the future is needed in order to ensure that the Plan's objectives achieve this overarching vision.

The following is a suggestion.

Our vision is for a community that manages for ecologically sustainable use, protects and conserves the coastal and marine ecosystems for the benefit of the community and future generations.

AREA OF INTEREST

The area of interest the Plan will cover includes Doubtless Bay/Tokerau, Mangonui habour, Karikari Peninsular and associated catchments. The catchments include Mangonui, Taipa and Aurere/Awapoko estuaries that feed into the Bay (Figure 2). Doubtless Bay is approximately 196 sq km, that is about 25,000 rugby fields. The total area including Karikari Peninsula, Moturoa Islands and out to 200m is 1659.4 sq km.

To date comments have been received that this is not enough or that no area should be defined because there are no boundaries in the sea. Other comments include the area should just be Doubtless Bay not Karikari Peninsula.

Having a defined area of interest will aid in determining the extent of our management mechanisms. It will aid in determining the size, design and

placement of these mechanisms. For example, if we have no defined area of interest how do we know the spatial effectiveness of these mechanisms on marine ecosystems. If we have a spawning closure within the Bay will this only effect the fish populations in the Bay or outside the Bay or up our rivers?

Having no defined area of interest will also allow us to reap the benefits of natural processes operating outside a particular area of interest. Because the marine environment has no fences but is all connected, management does not stop at any obscure boundaries.

Ideally, on a planning basis, the area of interest should take in biological or ecological regions, not geopolitical areas or regions.

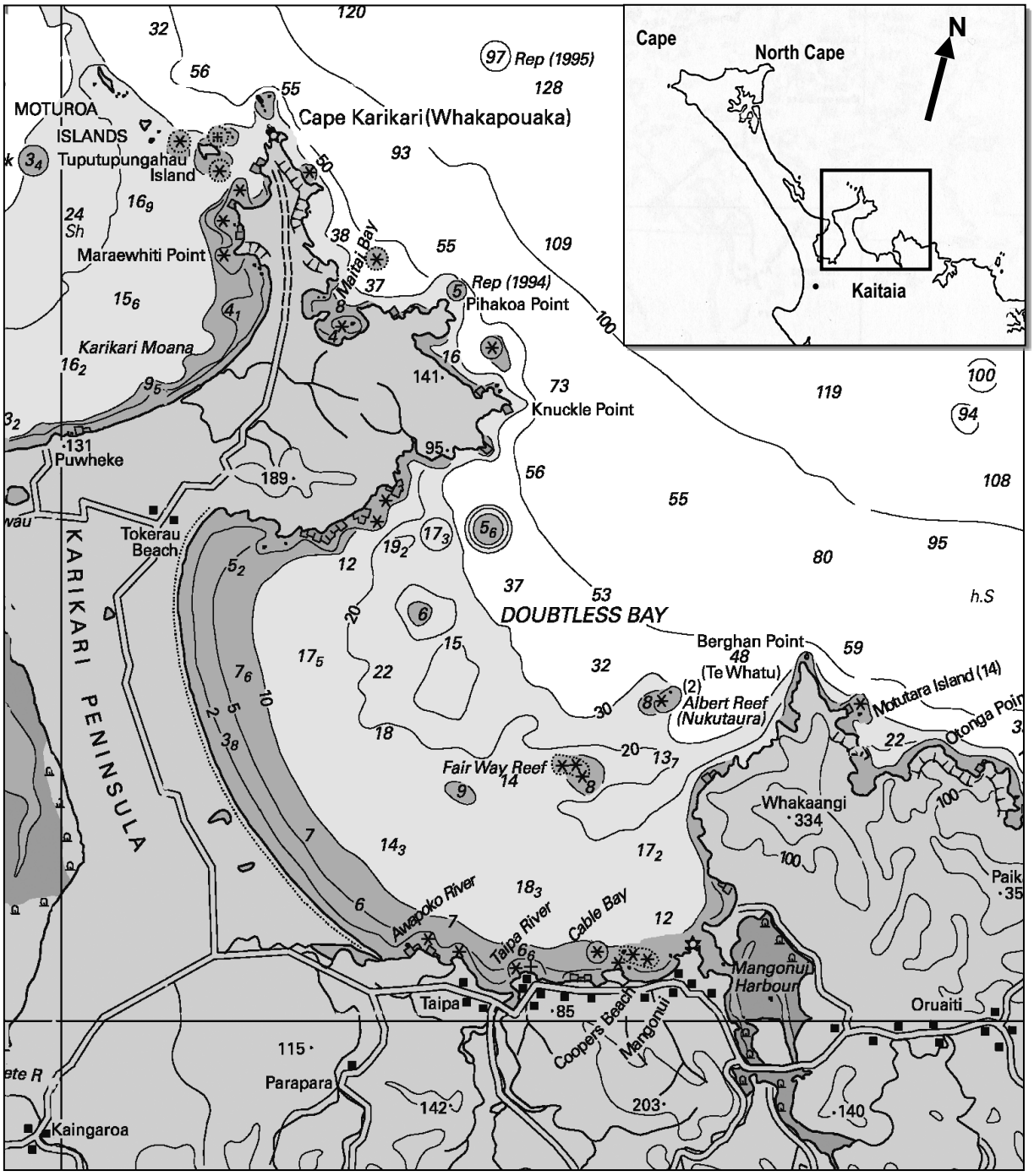


Figure 2. Location of Doubtless Bay and Karikari Peninsula, North Island, New Zealand.

However, there is agreement that catchments feeding into Doubtless Bay be included in the Plan.

CURRENT ENVIRONMENTAL PROTECTION

Northland Regional Council Coastal Plan
The Coastal Plan identifies Karikari Peninsula and Rangaunu estuary as a MARINE 1 (Protection) MANAGEMENT AREA (Figure 3). This means they are areas of important conservation value. Those values include: *protected areas, ecosystems and habitat values; varied subtidal habitats with unusual ecology including high diversity of subtropical marine species; one of the highest diversities of coastal fish species recorded in New Zealand*.

Criteria used for these values included: *tangata whenua customary rights, cultural values, protected areas; marine mammals and birds; ecosystems, flora and fauna habitats; outstanding natural landscapes and features; coastal landforms and associated processes* (see RCP Appendix 9).

MARINE 2 (Conservation) MANAGEMENT AREA represents the area outside Marine 1. This means that "*appropriate restraint is applied to the use and development of natural and physical resources within the Area, while also recognising that this Area is one where new uses and developments may be accommodated*" (rcp6).

What does all this mean?
The type of new use and development in these Areas is up to the discretion of the Northern Regional Council and their interpretation of what "protecting the values" of these Areas is all about.

Community-based Protection
In December 2004 a community-hapu *rahui* was placed on Mangonui estuary on all set netting (Figure 3).

Fisheries Act 1996
Within Doubtless Bay there are certain area-based fishing restrictions (Froude & Smith 2004) under the *Fisheries Act 1996*. Within Doubtless Bay there can be:

- No trawling
- No danish-seining
- No commercial fisher shall take any scallops
- Mangonui Harbour – no commercial fisher shall use for taking fish: a box or teichi net, purse seine, Dutch seine, trawl net, lampara net, or set nets>1000m total length
- Mangonui Harbour – no person who is not a Maori shall take oysters

Outside Doubtless Bay normal fishing restrictions and controls apply, such as:

- Amateur maximum daily bag limit of fish by species that can be taken or possessed by one person in any day
- No person can take or possess snapper <27cm length (Amateur)
- No person shall take or possess spotted black grouper (Amateur & commercial)
- No commercial fisher shall take any tuatua
- No commercial fisher shall take any green lipped mussels or spat
- No commercial fisher shall take any cockles, pipis

- No commercial fisher shall take any shortbill spearfish or sailfish
- No commercial fisher shall take kina for sale except by hand harvest

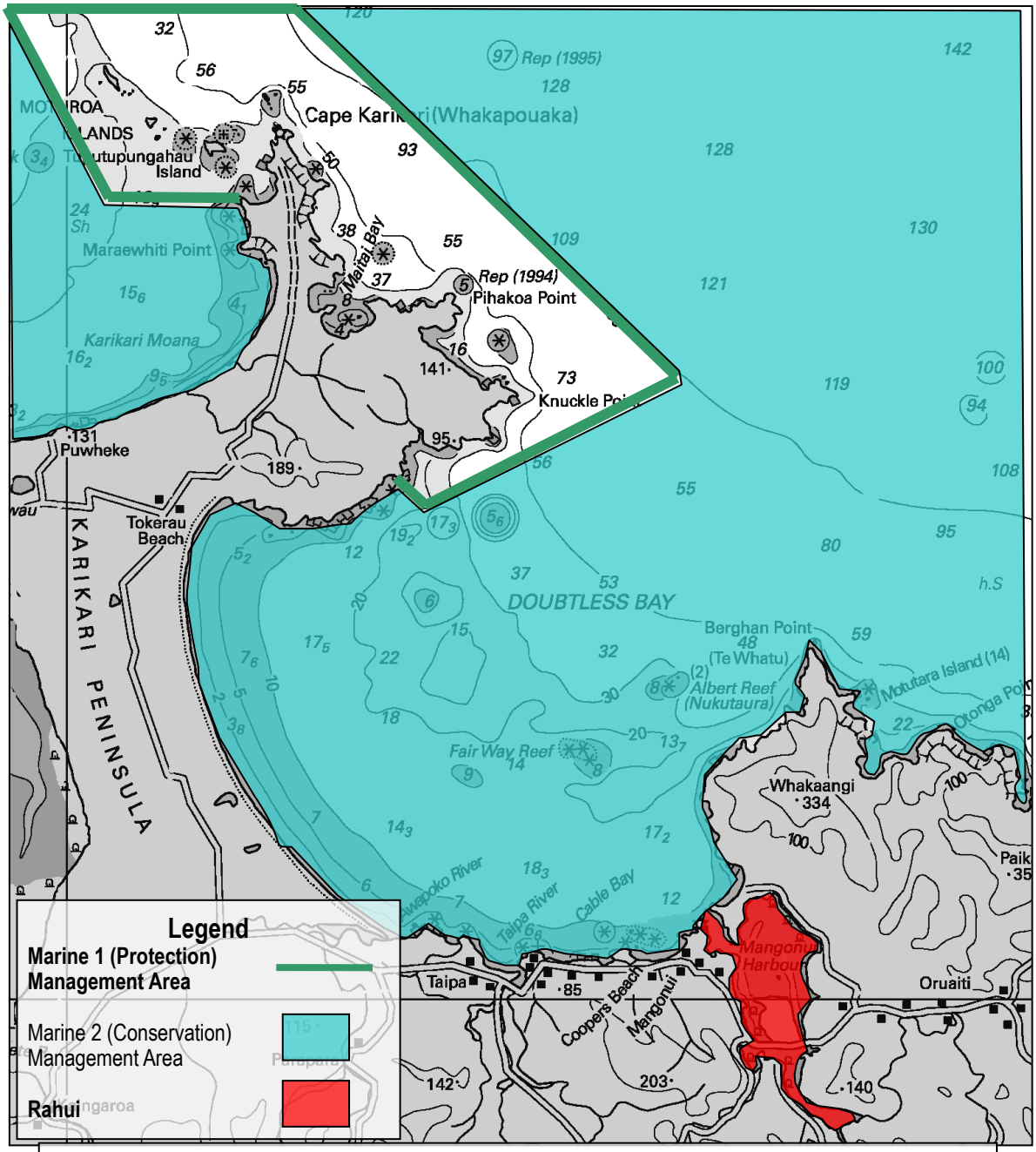


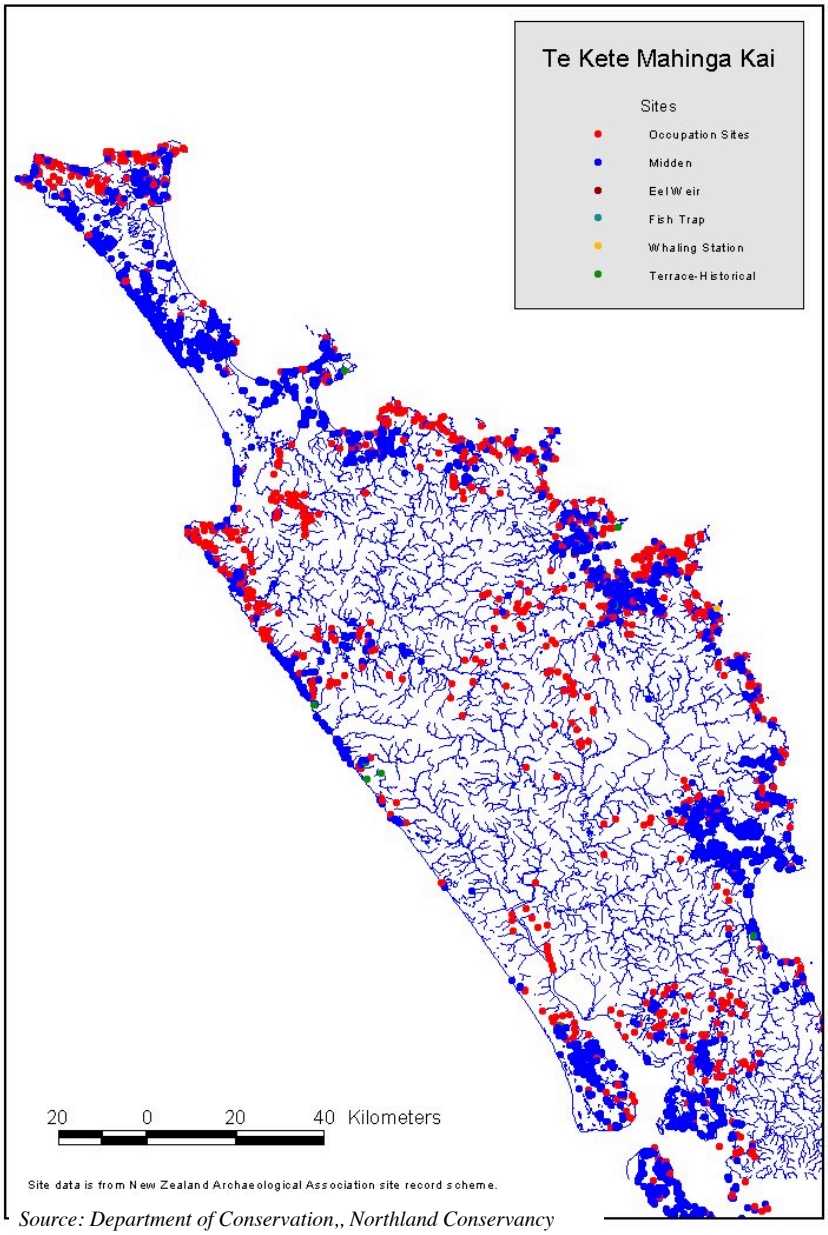
Figure 3. Location of existing marine protected areas. A Marine 1 (Protection) Management Area for Karikari Peninsula under the Northland Regional Council Coastal Plan (RMA) and a community-hapu rahui for Mangonui Harbour on all netting. (The actual latitude and longitude of the Marine Area 1 have not been drawn to scale. Please see the Coastal Plan for correct positions).

CULTURAL SIGNIFICANCE OF THE AREA

The Area is significant to Maori.

There are over 100 *mahinga kai* (eg. pa, midden, fish trap) sites in the Area where most are protected either by local ownership, regional or central government organisations (eg. Department of Conservation). However, many hapu believe that a significant *taonga*, the environment, is not adequately protected according to maori customs and protocols.

Marae (meeting houses) in the Area include: Te Rangi Nui (M), Haititai, Taipa,



Source: Department of Conservation,, Northland Conservancy

Parapara, Waiawa and Aputirewa are involved with Doubtless Bay which is their mana moana. Waiawa, Aputirewa and Te Rangi Nui marae are all involved with Mangonui estuary.

1. Traditional Occupation

This first visitor from the homeland, Hawaiiki, was Whakawhaka . He came and landed in the far north rohe of today's Ngati Kuri. It is unknown when he came, but Whakawhaka gave a detailed map of Aotearoa to Kupe (B. Smith, pers. comm. 2005). Maori have since occupied the Area since Kupe. Kupe made his landing on Aurere beach, about 900 A.D. From here he explored the coast of New Zealand before sailing back to his home in Hawaiiki (B. Smith & S. Heihei, pers. comm. 2005).

Since the 1960s, extensive surveys have been carried out of more than 1,000 archaeological sites in the Far North. There is evidence that the Area was occupied throughout prehistoric times, that specialised forms of agriculture were developed, and that the coastal resources were 'enthusiastically exploited' (Maingay 1986 – Muriwhenua Fishing Report 1988). Evidence can be seen from the shell middens along the beaches and dunes of Karikari Beach, shell and fishbone deposits along the Kaimaumau shoreline on Rangaunu Harbour. Parts of Doubtless Bay were also densely populated.

The Far North has a long and rich history of Maori occupation, extending back in time at least 700 years. The archaeological record indicates the importance of kai moana and there being a great dependence on the sea. There is also evidence of resource depletion in the North. It is proposed that, due to the very large populations known to exist in the Far North, and to sustain them, sophisticated management and harvesting techniques were required, but not until the sixteenth and seventeenth century (Muriwhenua[2] Fishing Report 1988).

Rangiawhiao (Karikari Peninsula), especially at the northern end, was an early Maori settlement. There were agricultural land, bush and permanent water sources. Rangaunu Bay, with its clear sandy bottom and rocky island reefs, were rich fisheries grounds (eg,. tuatua beds, puupuu (periwinkle), mussel, oyster, kina, scallops and rock lobster). Tokerau Beach was popular for is toheroa and tuatua beds. The people who occupied these summertime fishing villages were the early ancestors of the local tribe Ngati kahu. Today Ngati kahu have 21 marae surrounding Mangonui estuary and Doubtless Bay.

The sea of this Area held a lot more value than any equal area of land. Maori traded, and it was built into the Maori way. They traded widely throughout the Area and inland. Captain Cook's (and second mate) logbooks document the intensive trading of fish for nails and cloth (B. Smith, pers. comm. 2005; Muriwhenua Fishing Report 1988).

In 1792, the first whaler ship came to Mangonui estuary, which became a thriving port of call for whaling vessels for repairs and provisions and general R and R. Kai moana and other food supplies grown by Maori were traded with visiting ships. After 1840, with the increasing settler population, Doubtless Bay and Karikari Peninsula tribes were too remote from markets that emerged to take part in the lucrative trade in agriculture and fish products that developed. And then

[2] Muriwhenua was the name given to the treaty of waitangi claim from the 5 tribes Te Rarawa, Ngai Takoto, Ngati Kuri, Ngati Kahu and Te Aupouri. This is a name of one of the ancestors.

with the transfer of the capital to Auckland, the whole of the North entered a period of economic stagnation.

By 1980, the overfishing of the inshore fish stocks had occurred.

> *The Muriwhenua Maori lost not only 'their' fish to outside fishermen, as the grounds they had nurtured for centuries were largely fished out, but their fishing livelihoods too, and their ancient association with the seas was virtually ended.*

2. Maori Connection with the Sea – Tangaroa

Tangaroa, the Maori god of the sea, whose children are the fish and other sea creatures, was the son of the first family of Ranginui (sky father) and Papatuanuku (earth mother)[3]. It is believed by Maori that most humans, plants and animals are descendants of the first family.

Thus people are part of the sea through the kinship of the atua. With this connection brings special responsibilities and obligations to enhance and protect the sea – the concept of kaitaikitanga. Because people are intrinsically linked with nature, the mana of the iwi, hapu or whanau is directly related to the well-being of nature within their rohe.

3. Cultural Marine Significance

Nga korero a nga kaumatua o konei i mua, e penei ana: Ko te whenua to turangawaewae, ko Tangaroa hei oranga mou.

The elders of Karikari in previous times used to say: The land is your place to stand and Tangaroa is your sustenance.

McCully Matiu (Matiu and Mutu 2003)

The islands of Aotearoa are themselves originally a fish and a boat – the north island is for many iwi, Te Ika a Maui, the great fish hauled up from the deep sea by Maui the atua-ancestor, and the south island is the boat on which he and his brothers were out fishing.

Fishing has been and will continue to be, a traditional occupation of Maori in the Area. Maori were fine fishermen and were capable of operating on a very large scale, with enormous seine and trap nets (Muriwhenua Fishing Report 1988).

[3] Tane is the oldest child, the creator god of forests and birds. Tumatauenga is the atua of war and ceremony, Rongo the atua of cultivation, Tawhirimatea the atua of wind and storms, and Haumietiketike the atua of land and forest foods.

The entire area of Doubtless Bay, Karikari Moana, Rangaunu estuary, estuaries and offshore islands are all significant fishing grounds for Maori. The Muriwhenua Report (1988) states:

> *Fish stories are apocryphal, in anyone's language, but those we heard in Muriwhenua were too often affirmed and corroborated too well to defy belief. They tell of native communities so bound to the sea with a wealth of laws, customs and skills, and who once enjoyed a supply of fish so bountiful, that it sometimes seemed we were in another country.*

Table 1 is a list of important species in the rohe moana of Te Whanau Moana and Te Rorohuri, the hapu of Karikari Peninsula. Interviews with hapu representatives on the Doubtless Bay Marine Protection Group also include these species of importance to their hapu.

Table 1. A list of important kai moana species in the rohe moana of Te Whanau Moana and Te Rorohuri's territories (Source: Matiu and Mutu 2003), and other coastal hapu of Ngati Kahu.

Ngati Kahu name	English	Location	Use	Season
Tuuna	Freshwater eels	Waimango, Rotokawau	Eating	
Tamure	Snapper		Eating	
Tarakihi	Tarakihi	Grounds off Karikari and Tokerau	Eating	End October to beginning of Feb.
Porae	Porae	Grounds off Karikari and Tokerau	Eating	End October to beginning of Feb.
Whapuku	Hapuku, groper	Grounds off Te Rae-o-te-Whakapouaka & Moturoa Islands	Eating	Aug-Sept
Maomao	Blue maomao (and pink maomao)	Ohautetea, Kahika, Waregarahu	Eating	Late March-June
Warahenga	Kingfish		Eating	
Kanae	Mullet	Mangonui Taipa estuary Karikari, Waipapa, Tokerau	Eating	
Kina	Kina (sea egg)	Wherever there are rocks	Eating	Oct-Feb

Paua	Paua (Abalone)	Whakapouaka, Ohautetea	Eating	
Pipi	Tuatua	Karikari	Eating, Bait	
Koura	Crayfish Lobster	Moturoa, Kahika	Eating	
Kahawai	Kahawai		Bait	
Wheke	Octopus		Bait	

Maori fishing embraces not only the physical but also the spiritual, social and cultural dimensions. Elders had extensive knowledge of the fishing grounds, knew the proper seasons, the best places and the best manner in which to take fish and the best way to sustain them. Maori had strict laws and sea knowledge to preserve the *rawa moana* (the bounty of the sea) over many generations without dwindling the resource. Maori knew the spawning seasons and maturity of species. They knew their habits and movements, and visited appropriate fishing grounds according to a species seasonal abundance.

Tapu, *makutu* and *rahui* were applied to control human behaviour and protect natural resources (Muriwhenua Fishing Report 1988). *Tapu* and *makutu* protected fish resources by restraining the manner of use and extent of the user. *Rahui* was applied to prohibit the use of fishing grounds under pressure or to prevent fish being taken out of season.

> *R H Matthews who visited there* (Rangaunu harbour) *in 1855 and 1875 described in detail a shark fishing expedition involving over 1000 of the tribe, and a fleet of 50 canoes and two boats. The seasons for fishing kapeta (dogfish) was restricted to two days only in each year. The first time was about full moon in January, an by preference during the night named in the maori lunar calendar rakaunui, or two evenings after the full moon. The second time of fishing, called the pakoki, was two weeks later, just after new moon (whwha-ata), and was always held in daylight. This closed the season for the year.*
>
> *About 7000 shark were taken. On one large canoe, no less than 265 were caught or about 6 tons in weight. Included were the bigger tiger sharks that dragged the canoe until they could be hauled in and clubbed.*

Beyond fishing, the marine environment holds other values for Maori. There are special marine features, sites and places that are included in whakapapa, where iwi, hapu or whanau are descended from rivers, islands, seas, rocks or mountains.

The traditional takiwa of iwi, hapu or whanau uses boundary markers such as headlands, estuary mouths, rock stacks, beaches, islands and specific reefs.

Coastal areas have special significance for their connection with certain atua and ancestors. Particular ancestors and their travels and exploits are intrinsic in

particular places. For example, Matai Pa in Matai Bay is of significant spiritual and cultural significance to Te Whanau Moana. It is a wahi tapu site where past Ngati kahu chiefs used to meet. Also Waikura beach (Waikato Bay) is wahi tapu as it once was a burial ground. The sand dunes of Karikari beach are also wahi tapu.

Waipapa beach holds special cultural significance, because it is where the war canoe Waipapa landed. It is still there today but has now turned to stone.

The mountain inland from Waikura beach is named Te Matapura, and was once used as a marker for the tarahiki fishing grounds. The mountain known today as Puwheke is inextricably linked with Ngati Kahu whakapapa, because this is where the ancestral canoe, Mamaru, arrived to settle their whanau.

The tribe name, Ngati kahu, even links back to the first ancestors to arrive in Aotearoa. Ngati kahu comes from the ancestress, Kahutianui (Matiu and Mutu 2003).

SHIFTING BASELINE PHENOMENON
(Source: DIVE NZ mag issue 81)

"Wade Doak, New Zealand's celebrated author, diving pioneer, film maker, and conservationist describes the shifting baseline syndrome: 'This is a phenomenon whereby fishers are not aware of the overall depletion of the resource because the time they participate as extractive users is not long enough for them to see the long term effects that over fishing has. When subsequent fishers participate they see a resource at a completely new and different level. A new reduced baseline has been set. If you talk to the old guys then you begin to see the true picture of depletion of species around our coasts."

"The baseline has shifted down to a level which the new divers accept as okay, because that is the only level they have experienced."

The late Kelly Tarlton mentioned to Dave Moran while at the Three Kings in 1980 "the bird life which you are raving about (Dave) *is a kindergarten in comparison!" Kelly explained how there used to be schools of fish on the surface covering acres and acres in the 1960s. When Dave visited again in 1994, the birdlife had gone and the young divers were over the moon with seeing a small school of fish swimming past the boat.*

As well as places, the marine environment has unique value in the meaningfulness of particular sea creatures and kaitiaki species, such as fish, octopus, seabirds, sharks and whales. Such species are traditionally associated with an iwi, hapu or whanau through their whakapapa.

4. Maori Relationship with the Sea Today

Fishing activity has changed from being a tribal practice to more of an individual or whanau pursuit. The decline in large tribal expeditions started to occur in 1885 and was virtually non-existent by the turn of the 20th century (Muriwhenua Fishing Report 1988).

Maori still have the ancestral knowledge passed down to them from generation to generation. The knowledge of the Maori calendar, fish seasons, times of maturity, methods of fishing, conservation measures such as *rahui* and *tapu*. However, in many parts of the Area there have been significant losses, both of species and their habitats, and of the practical knowledge and the traditional cultural and spiritual frameworks within which environmental management was sustained.

For example, some sites that were once tapu for centuries are not; some methods of fishing (eg. spearing) are not used today.

These losses have been seen as an inevitable consequence of the loss of tangata whenua ownership and control over their places and resources (PCE 1999, Matiu and Mutu 2003).

Maori commercial fishing operations are non-existent in the Area.

There are no registered *kaitiaki* under the Customary Fishing Regulations 1998. But there are kaitiaki in each hapu today, and in the past there were kaitiaki for each atua and tahonga (spiritual leaders within hapu/iwi) controlled everything (B. Smith, pers. comm. 2005). Individuals were born kaitiaki where the elders used the stars, time of year and attitudes to decide which atua the kaitiaki will serve. Each kaitiaki administered laws they did not make the laws (B. Smith, pers. comm. 2005).

Customary Fishing

From the Sealord Deal of 1992[4], tribal authorities of the Area are to distribute the benefits of quota, shares in fishing companies and cash to runanga. In 2004, Runanga A Iwi O Ngatikahu received approximately $140,000. Unfortunately most of this assists the runanga with debts from Treaty of Waitangi claims (B. Smith, pers. comm. 2005).

The *Treaty of Waitangi (Fisheries Claims) Settlement Act* 1992 was also established. This involved Maori tribal authorities relinquishing all legal rights or interests in respect of commercial fishing, including commercial inland fisheries, and any commercial aspect of Maori customary fishing, in exchange for a one-off settlement which consisted of fishing quota[5], major shares in fishing companies and cash ("the Fisheries Settlement Deed"). Previous legislation has also tried to achieve similar outcomes. They were the *Oysters Fisheries Act 1866*; *Native Purposes Act 1937*; *Maori Social & Economic Advancement Act 1945*. Under the *Maori Social and Economic Advancement Act 1945* rohe moana were gazetted in 1945 and land was to follow in 1946, which were implemented by local tribal committee's within each hapu (similar to marae trust's today).

This *Treaty of Waitangi (Fisheries Claims) Settlement Act* and Fisheries Settlement Deed provides that the obligations of the Crown to Maori in respect of commercial fisheries are fulfilled, satisfied and discharged, thus extinguishing all rights of any commercial aspect of maori customary fishing. Also, all rights and interests in respect of non-commercial fishing have now been extinguished except

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[4] The government provided Maori tribal authorities with capital to participate in a joint venture with Brierley Investments Ltd to purchase Sealord Products ltd in return for Maori withdrawing all existing litigation and supporting the repeal of all legislative references to Maori fishing rights and interests including, but not lmited to, repeal of section 88(2) of the Fisheries Act 1983 and an amendment to the Treaty of Waitangi Act 1975 to exclude from the Tribunal's jurisdiction claims related to commercial fishing. The Sealords deal has been an ongoing debate espcially over allocation of the settlement resources and the character of the settlement itself.

[5] Under the Fisheries Settlement Deed quota totalling 20% of the total allowable commercial catches for all species is transferred per annum to Maori Fisheries Commission (created under the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992).

as provided for in the *Fisheries (Kaimoana Customary Fishing) Regulations 1998* (eg. Mataitai, Taiapure and appointment of kaitiaki).

The Group, local hapu and the tribal authority, Ngati Kahu, is considering the establishment of a mataitai in the Area. Ngati Kuri of Piwhane (Spirits Bay) are also considering a mataitai proposal to further protect the special ecosystem that is now closed to trawling. The intention of Ngati Kuri is for community management of natural resources so the ecosystem can recover and become viable again. New Zealand's first and only mataitai is at Rapaki Bay, Lyttelton Harbour.

Because of their great concern for the status of fish stocks in the Mangonui estuary, the local hapu, Matarahurahu, joined with the community to create a *rahui* on set netting within the estuary. It encompasses the entire estuary (including Oruaiti river) to its entrance.

Since the 1860s, the local Maori have great concern for the marine environment because they have experienced first hand the decline in fish stocks, the degradation of water quality in their local drinking streams, large-scale deforestation and the dispossession of their culture.

Because of the spiritual connection with the sea local hapu in the Area continue to be active in enhancing the protection of the marine environment and restoring kaitiakitanga.

ECOLOGICAL CHARACTERISTICS OF THE AREA

1. Marine Classification Systems for New Zealand

Two systems have been developed for New Zealand: the EEZ "Marine Environmental Classification" (MEC) framework and the biological based "Interim Nearshore Marine Classification" (INMARC). For these two scales, classifying the marine environment has been prepared to better monitor environmental performance indicators for management, plan for marine protected areas, resource management, policy analysis, research and development and meet international obligations as a signatory to the Convention on Biological Diversity (UNEP 1993).

Essentially the marine environment has been "compartmentalised" based on biological and physical parameters. For example, the distribution and abundance patterns of fish, molluscs, echinoderms, bryozoans, sponges, ascidians and algae; endemism, species diversity, as well as geological features and oceanography help to classify the marine environment into 'regions', 'classes' or 'ecoregions'.

Marine Environmental Classification (MEC)

This is a system that divides New Zealand's exclusive economic zone (EEZ) into areas of similar environmental or physical (eg. depth, slope, tidal current, temperature) characteristics, called "classes". The MEC is part of the Ministry for the Environment State of the Environment program, where the MEC will be used to report on particular state of environment indicators, coastal and marine planning, and conservation (Snelder et al 2004). Until recently there was no way of classifying and mapping different types of environment within the marine area.

For Doubtless Bay and Karikari Peninsula the MEC has described six different physical environment classes out of 296 or 78 within the 50-metre isobath. At a national scale, Doubtless Bay and Karikari Peninsula have only 7.6% of physical environmental classes found in the NZ marine environment <50m isobath (F. Smith, pers. comm. 2005).

Why do we need to know this?
The MEC will be an important tool to assist in predicting biological communities in our Area of interest, as physical parameters such as sea surface temperature and depth control to a great extent the distribution and abundance of biological communities. Therefore, this tool will assist the Group in determining the best location for marine reserves on a national, regional and local scale and thus meeting design criteria like the protection of representative habitats or unique habitats at these scales.

MEC can also assist in identifying effects of different resource use on different ecosystems. MEC will act as a *predictor* of potential impacts of events and resource uses based on ecosystem characteristics and susceptibility.

INMARC - Northeastern Biogeographic Region

INMARC has been developed to specifically help with a range of marine protection objectives under the New Zealand Biodiversity Strategy, and to help with identifying potential sites for protection in the nearshore area (see http://www.biodiversity.govt.nz/pdfs/seas/mpa%20consultation%20document.pdf). The use of this framework has been trailed in Northland (Kerr 2003; Walls, in review) and the South Island.

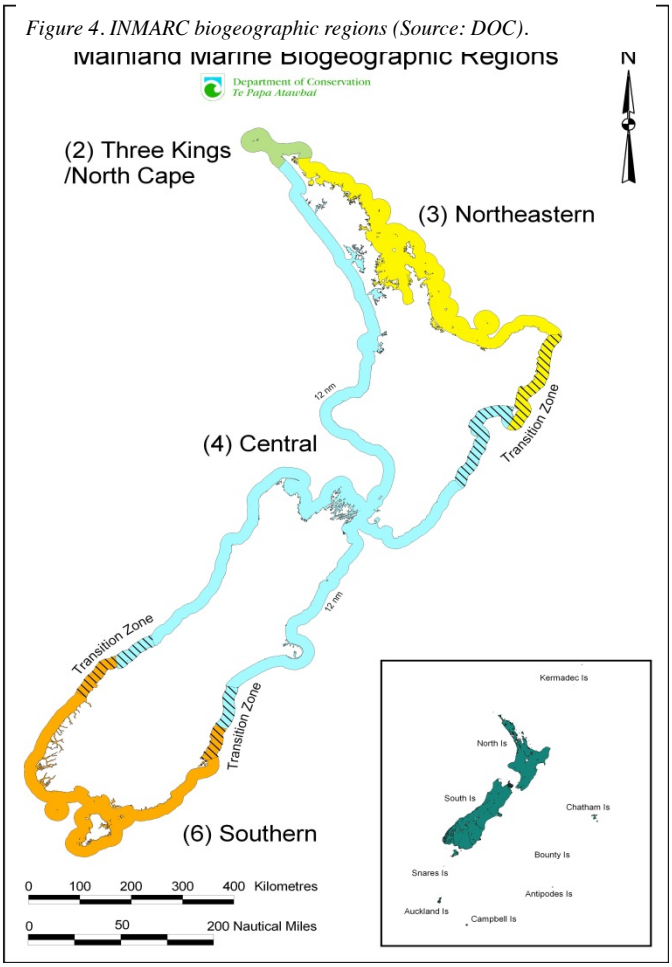


Figure 4. INMARC biogeographic regions (Source: DOC).

At the meso-scale (100s-1000s of km) level INMARC has divided New Zealand into 8 biogeographic regions (includes 4 offshore islands bioregions). Australia has 60 bioregions. INMARC also splits each region into a micro-scale (10s-100s km) coastal, shelf and island units (Walls, in review).

Doubtless Bay and Karikari Peninsula are found in the *northeastern biogeographic region* (Figure 4) (Walls, in review). This region is from North Cape to East Cape and is characterised by its endemic algae, molluscs, echinoids (starfish); its assemblages of sponges, ascidians, molluscs, fish, and echinoids. There are extensive rocky reef and soft sediment habitats throughout the region, which has the greatest fish and invertebrate biodiversity of all New Zealand biogeographic regions (Walls, in review).

2. Marine Ecosystem Services

Marine ecosystem services are the processes by which the environment produces resources that we often take for granted such as clean water, timber, and habitat for fisheries, and pollination of native or agricultural plants. Have you ever thought that the trees in your front yard work to trap dust, dirt and harmful gases (eg. carbon dioxide) from the air you breathe?

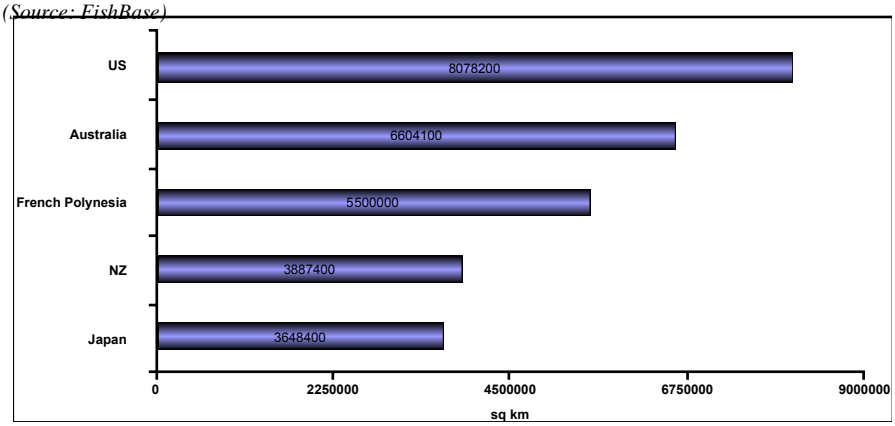
NZ's EEZ ecosystem services is valued at $183billion.

In 1998, NZ's seafood, oil and gas products are valued at $2.6

The marine environment provides such "services" as: cycle and move nutrients; detoxify and decompose wastes; maintain biodiversity; contribute to climate stability; moderate weather patterns, their extremes and impacts; purify the air and water.

Some 8000 marine species have been identified in New Zealand. Around seven new species are discovered each fortnight. Scientists tell us that as much as 80% of New Zealand's biodiversity could be found in the sea. The size of New Zealand's exclusive economic zone (EEZ) is the fourth largest in the world at 3.8 million sq km (Figure 5). The sea is essentially 15 times the size of our land and contains most of the world's biological diversity[6].

Figure 5. The size of New Zealand's Exclusive Economic Zone is amongst the top 5 in the world. (Source: FishBase)



By far the greatest value of our marine environment is in the ecosystem services it provides. We tend to think of the sea only for its value in seafood, oil and gas, tourism and recreation. However, these ecosystem services, many of which operate on a global scale, are the real wealth of the oceans. For example, in NZ, the EEZ totals 1.69% of the world's oceans, with an estimated ecosystem service value of NZ$183 billion. The value of seafood and oil and gas products in 1998 was NZ$2.6 billion (PCE 1999).

The "value" of such services is not fully captured in commercial markets or adequately quantified to compare with economic services. This neglect may compromise the sustainability of humans on the Earth (Costanza et al 1997).

[6] Biological diversity or biodiversity is about the number of different species, genetic populations and ecosystems.

3. Oceanography of the Area

The region is influenced by subtropical water of the East Auckland Current (EAC) which is a southward flowing current transporting water southwards along the continental shelf (Figure 6). The EAC has separated from the Tasman Front, which has travelled the Tasman Sea from Australia. Along the inner margin of the EAC, flow is generally to the southeast, but is commonly reflected eastwards offshore from Karikari Peninsula where it encroaches now and then (Denham et al 1984). The coast experiences low energy wave climate, but is subjected intermitently to episodes of high energy, easterly and northerly quarter, storm and swell waves (Brook 2002).

These currents determine species composition, distributions and dispersal, controlling the movement of sediments and nutrients and influencing the seasonal variations in salinity and temperature. For example, studies of the larval dispersal of rock lobster were significantly dependent on the Wairarapa Eddy off eastern New Zealand.

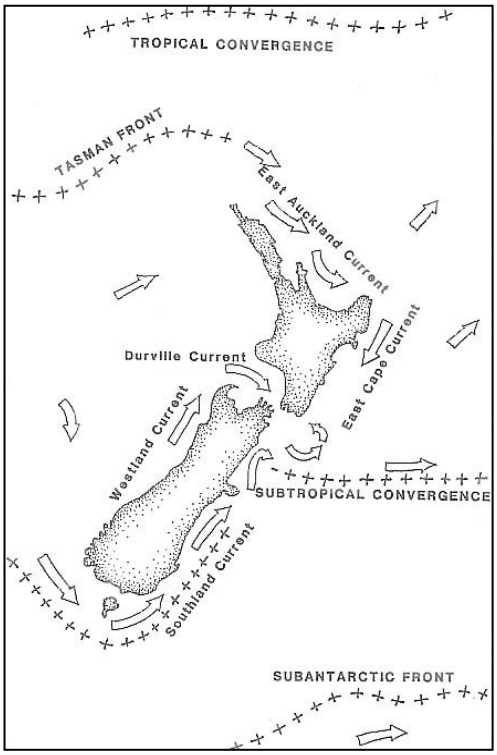


Figure 6. Oceanography of New Zealand (Source. B. Ballantine).

There are no upwelling zones in the Area like there are at Three Kings and Cape Reinga areas, where there can be low sea surface temperatures (SSTs) and high primary productivity.

SSTs around Northlands' open coast typically range from a minimum of 14-16 C in winter (August-September) to a maximum of about 20-22 C in summer (February-March). These winter and summer temperatures would be greater in the estuaries of Doubtless Bay because of the shallow depth, less wave exposure and water current influences.

The maximum tidal range is 2m for Karikari Bay to Cape Karikari and 2.1m for Doubtless Bay. Karikari Peninsula tidal range of 1.7 m.

The 45m depth contour lies within a few tens to hundreds metres off Karikari Peninsula. Most of Doubtless Bay is in depths less than 30-40m.

The nutrient content of this areas' ocean has not been documented, only at a broad-scale of New Zealand's open oceans. This information is required to better understand ecosystem structure and function. However, suspended solids are higher in the estuaries and have lower salinities than on the open coast.

4. Biological communities

(NEED MAP OF LOCATION NAMES & REEF NAMES)

There are two totally different ecosystems found in the Area: estuarine and marine. Within these two ecosystems are several habitats. The estuarine system is more sheltered, with different tidal influences and water movement patterns than open marine areas.

The following sections describe the biological communities of these ecosystems found in the Area.

1. KARIKARI PENINSULA

This is the area of Karikari Bay/ Karikari Peninsula to the northwest of the Cape Karikari (*Whakapouaka*) headland and south to Knuckle Point. Karikari Peninsula is a tombolo (sandspit joining a former island to the mainland) 5km wide and 13 km long consisting of dunes, interdune swamps, lagoons and lakes (Rangaunu Harbour Study 1984). The indented coast consists of exposed rock and cliffs interspersed by small, sandy bays. The reefs are moderate to steeply sloping boulders and bedrock.

Offshore areas include reef pinnacles, sands and muddy sands.

On land, virtually all of the original vegetation in the area has been removed and replaced by pasture, exotic and indigenous scrub and pine plantation (Shaw & Maingay 1990).

The Peninsula has international significance for supporting habitats for the locally endemic land snail (*Allodiscus fallax*) (Shaw & Maingay 1990), which is a result of its once geographic isolation when it was an island. Beaches north of Matai Bay are of geomorphologic significance because of the presence of penultimate interglacial age intertidal boulder beaches.

Coastal plants of Karikari Moana include marram grass (*Ammophila arenaria*) and pingao (*Desmoschoenus spiralis*).

Habitats & biota

Karikari Peninsula is a typical northeastern rocky reef lined area, but experiences a totally different reef fish fauna because of the influence of the subtropical water currents, the EAC. Shallow subtidal habitats support high abundances and diversity of subtropical fish and invertebrate species (Willan *et al* 1979, Brook 2002), second to that of the Poor Knights islands.

Typical habitats (<20m) include: shallow *Carpophyllum, ecklonia* forest, kina barrens, sand, cobbles, *C. flexuosum* forest, encrusting invertebrates, mixed algae

and *Caulerpa* mats (Shears and Babcock 2004). The algal communities exhibit the typical northeastern New Zealand pattern but with considerable variation in the depth and extent of urchin barrens. *Ecklonia* forest typically dominated below the urchin grazed habitat (>12m) (Shears and Babcock 2004). *Carpophyllum angustifolium* is absent from Karikari Peninsula.

Reefs extend to depths greater than 12m (Shears and Babcock 2004). Biomass of large brown algae and density of kina tends to be reklated to depth and wave exposure. For example, with increasing wave exposure, kina were more abundant at greater depths and the biomass of algae was lower (eg. Sunburn Pt and Pihoaka Pt).

However, on the western side of the Peninsula, in Karikari Bay, it is predominantly a soft shore habitat (open, white sand beaches backed by extensive Pleistocene and Holocene dunefields and wetlands) broken by a number of minor rocky outcrops and indented by Rangaunu estuary. This is a low energy shore with prevailing wind from the west. Exposed to storm surges from the east and north.

Karikari Moana (L. Makey)

There are sheltered bays at Ohungahunga Bay and Matai Bay which have rocky headlands that recurve to within 0.9km of each other. Here are reefs sloping to a substrate of sand patches interspersed with small, loose boulders at about 10m depth.

Rock walls that continue from the cliffs above drop down to depths of about 15m in some places along the eastern side of the Peninsula. For example, Pihakoa Point and Black Point are completely open to the north and east with rock walls down to 15-18m changing into boulder habitat interspersed with small patches of sand. Caves and recesses exist at Black Point with large abundance of kelp.

Pinnacle structures, such as Matai Pinnacle and in areas adjacent to Florance Bay and Knuckle Point, descend deeply to 45-50m. At shallow depths (<30m) the pinnacles are kelp covered (*Ecklonia* down to about 30m) then at greater depths (>30m) change into general encrusting invertebrate habitat (eg. sponge and jewel anemone gardens).

Algal diversity:

Shears and Babcock (2004) found that KP had the highest species richness for algae, with 47 species, which was higher than the offshore islands of the Poor Knights, Mokohinau and Tuhua, off Tauranga. The high diversity was due to the large number of small algal species occurring as understorey species beneath the *Ecklonia*.

However, algal biomass was low compared to other sites Shears and Babcock (2004) sampled. Karikari Peninsular was the second lowest in algal biomass. Biomass was dominanted by large brown algae (*Carpophyllum* species*, Ecklonia, Xiphophora chondrophylla*, *Cystophora torulosa*). Productivity was also low compared to other sites, but was similar to Cape Reinga and Leigh sites. Productivity was not just due to the dominant large brown algae, but large proportions of red foliose, red turfing and green algae.

Invertebrates

Gastropod (eg. cat's eye, whelks, cowries, paua, periwinkle, limpets, and sea slugs) densities are similar to those of the offshore islands Poor Knights, Tuhua and Mokinhanu. Densities were low at Cape Karikari sites (Shears and Babcock 2004) compared to other sites studied (eg. Cape Reinga, Leigh, Poor Knights etc). *Cookia sulcata* (Cook's turban) was the most abundant gastropod at all sites and depths. *Modelia granosus* was locally abundant at Pihakoa Point.

Kina barren habitats are extensive, especially at exposed sites (Sunburn Pt and Pihakoa Pt) where this habitat extended down to depths greater than 12 metres.

Tuatua (*Amphidesma subtriangulatum*) and scallops (*Pecten novaezelandiae*) are common bivalves on the shores of Karikari Moana.

Offshore communities of *Tawera spissa* (Morning star shell) - *Venericardia purpurata* (Purple cockle) and *Pratulum pulchellum* (Strawberry cockle) - *V purpurata* are found on sandy substrates.

Packhorse and red crayfish (lobster) are not as common today. The Peninsula and Doubtless Bay use to support a commercial fishery.

Fish

Subtropical fish and invertebrate species abundance and diversity are high (Willan *et al* 1979, Brook 2002), second to that of the Poor Knights islands. Brook (2002) has comprehensively recorded over 80 fish species (Appendix 1), 43% being widespread species and 24.4% warm temperate species and 32.6% subtropical-tropical species. Brook (2002) found that Karikari Peninsula had some species not found at any other location studied (also referred to as endemic), for example, striped boarfish, banded scalyfin (damselfish), elegant wrasse, red pigfish (*Pakurakura*), and combfish.

Other common reef associated fish include eagle ray, moray eels, rock cod, slender roughy, pink and blue maomao, trevally, spotted black grouper, kahawai, parore, red moki, tarahiki, porae, kelpfish, butterfish, parrotfish, blennies, and leatherjacket. Spectacular schools of trevally and blue maomao are not as common as they once were (E. Mackay, pers. comm. 2005).

Other pelagic schooling species found adjacent to Karikari Peninsula include commercially targeted blue mackerel, kahawai, tarahiki, skipjack tuna and jack mackerels. Most of the schools are 'layered', with different species occupying the school at different depths. For example, if targeting snapper, they can associated with a baifish-kahawai school where they are found under the kahawai. This is also relevant to tuna where they can be associated with jack mackerel schools.

Karikari Peninsular has similar fish diversity to that of the offshore Three Kings Islands (Brook 2002), but is totally different to fish diversity seen in Mangonui estuary or other estuaries in Doubtless Bay. Karikari Peninsular has higher species richness than the western North Island fish fauna.

Population dynamics of the different reef-associated and pelagic species are controlled by both physical (eg. depth, water currents) and biological factors (eg. presence kelp forest or soft sediments). For example, leatherjacket, butterfish, and demoseilles are found associated with kelp forest habitat (Anderson & Millar 2004); whereas pelagic fish, like kingfish, can be commonly associated with fast moving currents (eg. Cape Karikari) or different currents meeting at headlands.

2. DOUBTLESS BAY

Doubtless Bay is a large bay between Berghan Point in the south and Knuckle Point (Karikari Peninsula) in the north. The Bay covers approximately 196km^2 with exposed rocky and cliff headlands along the coast; interspersed with sandy beaches and an exposed sandy surf beach (Tokerau Beach).

There are both exposed southeast and northwest facing rocky shores, within the two sides of the Bay having different exposures (Whatuwhiwhi much less exposed than Berghan Point).

The Mangonui, Taipa and Aurere/Awapoko estuaries enter into the southern part of Doubtless Bay.

Habitats

Approximately eight types of habitats have been found from recent Department of Conservation habitat mapping of Doubtless Bay (Dr. R. Grace, pers. comm. 2005) (Table 2). The estuaries of Mangonui and Taipa were not mapped, but have quite different habitat types compared to the Bay. The Bay has typical northeastern NZ habitats but does exhibit some unusual habitats, such as the extensive *mixed rock and sediment* habitat, apparently not recorded in high amounts in one location (Dr Grace, pers. comm. 2005). This type of habitat is excellent for juvenile fish nurseries and would contain high biodiversity.

Table 2. Descriptions of the habitat types typically found in Doubtless Bay. Habitat names and descriptions may vary with future publications of this work (Source. Dr R. Grace, pers. comm.. 2005).

Habitat Type	Depth Range (m)	Description	Location
Shallow-Mixed Weed	0-8m	Composition and depth range varies with exposure. At very exposed sites *Carpophyllum flexuosum* is the dominant species. Occurs with *C. maschalocarpum*, red algae, coralline turf species and some *Lessonia variegata* (especially in surge areas). At sheltered sites *C. maschalocarpum* occurs as a narrower band. Crustose coralline turf algae.	Knuckle Point, Berghan Point; Albert Reef, Fairway reef; Whatuwhiwhi coast, Coopers Beach.
Kina Zone or Urchin Barrens	3-14m	Depth range varies with exposure. Very little large brown aglae. Kina mainly occurs with turf algae and Crustose coralline algae with some occurrence of small *C. flexuosum* plants. Density of kina will vary with exposure too. Grazing gastropods, *Cookia sulcata* (Cook's Turban) and limpets.	Throughout Bay
Ecklonia Forest	3-29m	Depth range changes with exposure. Monospecific stands of *Ecklonia* algae. Can be sparse at very exposed sites and dense in sheltered sites. Bottom of *ecklonia* forest meets sediment and *Caulerpa* (green algae) mats. Occasional *C. flexuosum Sargassum sinclairii* and *C. plumosum* plants occur in more sheltered areas.	Throughout Bay
Deep Reef	>29	Occurs at bottom of *Ecklonia* and deepter where sponges (finger and encrusting species), bryozoans, ascidians, gorgonians dominant. Large brown algae is rare.	Outer Bay
Gravel-Cobbles		Cobbles and gravel dominant. Large brown algae is absent.	Patches occur throughout Bay
Sand-Mud		Gradient of shallow sand changing to deeper fine-mud-sand mixture.	Coopers Beach Throughout Bay
Mixed Rock & Sediment		Rock interspersed with sediment, usually gravel and cobbles. Hard rock may support large brown algae, kina barrens, deep reef or *Caulerpa* mats depending on depth.	Throughout Bay & Whatawhwiwhi coast
Mangroves		Mangroves	Chucks Cove, Brodies Creek

The depth of the Bay ranges between 0-70m with the 50m depth contour sitting inside the Bay. The outer most reef, Albert Reef (*Nukutaura*), the top is exposed/ awash then drops down to 30m. This reef extends south towards Fair Way Reef, which dries at 2.6 metres. This reef has a gradual slope down to 15m.

9m reef is located southwest of Fair Way reef, which is a reef system extending down to 15-20m. 6m reef is 2.5km from the Whatuwhiwhi coast and extends down to 20m.

About 2-2.5km offshore from Brodies Creek, between the 30-50m depth contours, the pinnacle Bastard Rock sits in 30-40m with the top of the pinnacle at 5.5m. This habitat is different from your typical rocky reef systems, where the pinnacle is exposed to different wave action, tidal currents bringing with it schooling fish, resident filter-feeding communities (eg. bryzoans, sponges, jewel anemones) and rare fauna. Black coral has been recorded here (M. Pope, D. McColl, A. Kunz, pers. comm. 2005). It has also been sighted off Berghan Point right through to Knuckle Point and up to Matai Pinnacle (M. Pope, D. McColl, pers. comm. 2005). 2-3 more pinnacles are situated just off Knuckle Point.

Shellfish

The inner subtidal sandy flats of Doubtless Bay have been the home to extensive scallop, tuatua and horse mussel beds (D. McColl, R. Morey, H. Matiu, pers. comm. 2005). However, today there is only small remnant and seasonal beds scattered throughout the inner Bay.

Tuatua are still found irregularly and collected along Tokerau Beach. A large tuatua bed used to exist adjacent to Coopers Beach but are now found in very low numbers and periodically.

When scallops were commercially exploited in Doubtless Bay there was occasionally catches of large scallops and, in one year in the late 1980s, supported much of the commercial fleet for several weeks.

Toheroa, a culturally, recreationally and commercially, important species once were abundant along the intertidal areas of Tokerau beach (Morrison 2005). They are a popular species of exposed surf beaches, like Ninety Mile Beach which supports abundant populations of toheroa.

Benthic invertebrates have been collected along open coasts of Northland by NIWA (Morrison 2005), although there is no ordered description of their contents. A lot of work has been done on soft-sediment assemblages of Northlands estuaries and islands.

Other invertebrate species found along the exposed beaches of the Bay include typical assemblages of bivalves, gastropods and crustaceans, such as the surf clam (sandy beach bivalves), purple cockle, mouse shell, and paddle crabs.

Fish & Mobile Invertebrates

Common fish fauna of the Bay include recreational and commercially important species and reef-associated species. Fishers regularly catch snapper, tarahiki, gurnard, kahawai, and mullet within the Bay. Schooling baitfish (eg. anchovies

and pilchards) were once a common site throughout the year but today are rarely seen. However, there are still resident jack mackerel schools within the Bay.

Typical reef-associated fish include blue and pink maomao, john dory, scorpionfish, koheru, goatfish, bigeye, mado, sweep, red moki, demoiselles, wrasses, black angelfish, leatherjacket, pigfish, drummer, and triplefins.

Juvenile snapper has been recorded in Doubtless Bay. Large abundances of 0+ (between 500-999/nautical mile) and 1+ (between 100-499/nautical mile) snapper in the northwest of the Bay (Langley 1993). No 0+ or 1+ juveniles were found outside the Bay. Large abundances of juveniles may be present in the Bay because of the availability of shelter like *Caulerpa* beds (M. Morrison, pers. comm. 2005).

Both packhorse and red crayfish (lobsters) are found in the Bay. Legal sized individuals are very rare to find and it is believed this species is in decline.

3. MANGONUI, TAIPA & AURERE/AWAPOKO ESTUARIES:

Mangonui, Taipa and Aurere/Awapoko estuaries are situated in the southern part of Doubtless Bay. Shaw and Maingay (1990) state that Mangonui and Taipa estuaries are of 'National Importance' because of the presence of threatened bird species (eg. banded rail, fernbird, bittern) and the plant *Pittosporum pimeleoides*; and the presence of coastal forest remnants adjacent to Taipa estuary.

Mangonui, Taipa and Aurere/Awapoko estuaries have been classified as "tombolo" types (Hume & Herdendorf 1988). This is essentially a sandbar that has formed over time, across an embayment, thus fixing the inlet position. Rangaunu estuary is also classified in this way. The estuaries have been classified mainly on how they were formed (eg. volcanic eruption, ice age, earthquakes), tidal regimes and their shape.

Marine Plants & Habitats

Mangonui, Taipa and Aurere estuaries are typical examples for northeastern New Zealand. They are mangrove (*Avicennia marina*) lined with adjacent saltmarsh (*Juncus)* communities, which border onto pasture or farmed land (Chapman 1978). In the early 1950's, seagrass beds were once present with the cockle beds in Mangonui estuary (H. Matiu, pers. comm. 2005).

Both Mangonui and Taipa estuary have tall to low stands of mangroves (Chapman 1978; L. Makey, pers. comm. 2005). Due to the development and infilling of Back River Road to build a causeway from Paewhenua Island across to Mangonui-Oruru Road, mangroves have colonised as a result of the build up of sediment. This situation is common throughout the distribution of mangroves where mangroves have naturally expanded into areas they were once not found. This spread appears to be due to poor land management and the accumulation of

sediments in estuaries. NIWA research has found with the addition of the nutrient nitrogen, growth of mangroves is enhanced.

Chapman (1978) produced aerial photographs of Taipa and Mangonui estuaries and provided recommendations for the preservation of specific stands of intertidal vegetation. The extent to which the distribution of vegetation has changed has not been documented and no protection was implemented.

The mangroves, and tidal habitats, support a rich diversity of fauna and among the most productive fisheries environments. All mangroves have value (M. Morrison, pers. comm.. 2005). Mangroves provide various functions, such as providing valuable juvenile fish habitat. Direct mangrove sampling by NIWA has found that mangroves are very important for juvenile fish species such as short-finned eel, snapper (especially in Rangaunu estuary), yellow-eyed mullet, and parore on the east coast and grey mullet on the west coast (M. Morrison, pers. comm. 2005).

Other important functions of mangroves include erosion control, water clarity, trapping land-derived sediments. Problems such as eutrophication, oil pollution, increased sedimentation and weed invasion will occur and will need to be managed if such valuable habitats are removed.

Mudflats make up 94% of the area of Mangonui Harbour. At the mouth of the Taipa estuary, sand flats are exposed at low tide with medium to low mangrove occurrence (Chapman 1978). Ryders creek, Paranui stream and Oruru river feed into the Taipa estuary.

Soft muddy sediment forms the floor of the estuary with rocky reefs present at the entrances to the estuaries. No soft sediment core samples have been taken in order to measure benthic infauna.

Shellfish

Typical fauna include cockle beds, which are exposed at low tides and green mussels on rocks at entrance to estuaries. Horse mussel and scallop beds used to be present back in the 1960s within Mangonui estuary, but due to the increase in sedimentation these have now disappeared (R. Lloyd, pers. comm., 2005). Rock oysters are a common sight, mainly occurring on exposed rocky shores present in estuaries.

Kina was once commonly collected at the entrances of all estuaries.

The Asian-date mussel has also been found in Mangonui estuary.

Fish

Northland's estuaries support nursery grounds for estuarine and coastal adult fish populations (Morrison 2005). Juvenile fish sampling of Mangonui estuary

intertidal flats showed the presence of juvenile yellow-eyed mullet, anchovy, triplefins, short-finned eels, parore, and sand goby (M Morrison pers. comm. 2005). Most of these juveniles were less than 1 year old, showing the value of estuaries as nursery areas. Some of these species, especially yellow-eyed mullet and anchovy, become baitfish within the coastal food chain, for such species as birds, larger fish and marine mammals (Morrison 2005).

Mangonui is a small catchment and so its contribution to fish populations of Northland is quite small compared to a large catchment like Rangaunu estuary. This estuary has extensive seagrass beds extending up into mangrove forests and has good water quality with lightly degraded catchment. Such attributes provide excellent nursery grounds for juvenile fish (M. Morrison pers. comm. 2005). Three-dimensional habitats like seagrass beds, sponge gardens and live horse mussels beds support high abundances of juvenile and small fish, compared to less structured habitats like sand flats and other soft sediment habitats (Morrison et al, in press).

Juvenile snapper has not been recorded in the estuaries, only in Doubtless Bay at quite large abundances as 0+ and 1+ snapper (Langley 1993). Juveniles are present in the Bay because of shelter provided by such habitats as *Caulerpa* beds (M. Morrison, pers. comm. 2005).

Adult fish caught and observed in these estuaries include kingfish (Mangonui estuary only), eels, herring, anchovy, garfish, yellow-eyed and grey mullet, butterfish *Marari* (possible spawning ground in Mangonui), sprats, parore, and kahawai. Mangonui estuary used to be *"red with snapper tails*" and tarahiki were once commercially targeted at the entrance.

Adult yellow-belly and sand flounder are very common in the (particular Hihi Bay) Mangonui estuary and support a local commercial fishing operation.

Kingfish, kahawai and snapper used to travel up through the Oruaiti River to spawn (H Matiu, pers. comm.. 2005). A beaching of John Dory has also been commonly observed around from Butler Point, Mangonui estuary.

Large Fish
No sharks have been seen in the estuaries for several decades. Mangonui estuary was named by the local hapu after the frequent visits of sharks (H. Matiu, pers. comm. 2005).

4. MOTUROA ISLANDS

Located northwest of Cape Karikari, the Moturoa Islands comprise of three small islands and a number of adjacent rocks and stacks (Shaw & Maingay 1990). There are sheltered and exposed bays.

The intertidal and sublittoral distribution patterns have been studied here by Grace and Puch (1977) and describe the islands to have generally typical patterns expected of northeastern New Zealand, except for the presence of the "*Novastoa lamellose* zone". This gastropod produces honeycomb galleries. It was found to form masses over 200 millimetres thick on vertical surfaces. This species does occur on several offshore islands in northern New Zealand, as well as the Chatham Islands. However it does not form as abundantly like at the Moturoa Islands. When Grace and Puch (1977) visited areas about 1.5km from Moturoa Islands in 1976, not a single *Novastoa* was found.

Subtidal large brown algae dominant down to 35m where they are replaced by sponge gardens, bryosozns, hydroids, and ascidians (Grace & Puch 1977).

The 45m depth contour approaches to the north of the islands and has been described by fisher and marine users as a very dynamic and productive area for fishing, especially for big pelagic species (eg. kingfish, sharks, marlin) and packhorse crayfish.

The islands have international importance because of the nesting area for seabirds and due to the presence of rare lizards. Shaw & Maingay (1990) state the islands had national importance as rat-free refugia, however the status of this today is unknown. Seabirds that nest on the islands include diving petrel, white-faced storm petrel and fluttering shearwater (Adams 1971).

Maori privately own the Islands. The islands were utilised by maori and contain sites of traditional value. Prehistoric studies are present but have not been surveyed. A whaling station was located on Whale Island, the most southerly of the group (Shaw & Maingay 1990).

5. OFFSHORE – OPENWATER & DEEPWATER HABITATS

This is an area we do not know a lot about at all. At present more is known about the moon than the deep sea.

This area is the adjacent deepwater habitats to Doubtless Bay and Karikari Peninsula. The 100m contour line sits just within 3-4km of the entrance to Doubtless Bay.

We do know from local ex-commercial fishers that the substrate is soft sand-mud (snow) with some reefs, has schools of pelagic fish, such as deepwater hapuka and bluenose. In greater depths of 250m, the commercially targeted gemfish, hoki and ling reside (M. Cryer, pers. comm., 2005). Some reefs, for example, 55m-reef located just outside Doubtless Bay, were once heavily set netted commercially for various species. Why it was so popular and what resides there today is unknown.

Very little quantitative information exists on the importance of deepwater coastal habitats as fish nurseries. We do know that some deepsea species have a juvenile

stage of development that occupies shallower habitats or shallower pelagic habitats.

6. MARINE MAMMALS

Whales and dolphins occur in the Area. Observations of northern right whale, pilot whales, hectors dolphin (very rare), NZ fur seals (haul out at Knuckle Point), bottle-nose dolphins and orca.

Orca or killer whales are a popular visitor to Doubtless Bay and they frequent Taipa estuary to feed on the stingray population. Size of the pods is usually 2-3 with a baby and they usually only stay for 6-12 hours before leaving the Bay. Two right whales visited the area but only for a day. Bottlenose dolphins can usually be seen in pods up to 12, throughout the Bay (D. Pankhurst, pers. comm. 2005).

Beach strandings of pilot whales have occurred in the past, mainly at Tokerau Beach and Karikari Beach during August to October (D. Pankhurst, pers. comm. 2005).

7. SEA BIRDS & SHORE BIRDS

Karikari Peninsula, including Waimango wetland and associated streams, has a rich population of common and endangered seabirds and shorebirds. For example, the Peninsula is home to the breeding New Zealand Dotterel, Variable Oystercatcher, Banded Dotterel, White-Fronted Tern, Pied Shag, and seasonal visitors Turnstone, Wrybill, Black-Fronted Tern, Red Necked Stint. Table 3 and 4 show the distribution and conservation status of breeding and resident shorebird and seabird populations.

Seabirds that have been recorded here but not breeding include, Bullers shearwater, Flesh-footed Shearwater, Little Shearwater, Diving Petrel, White-faced Storm Petrel, Fairy Prion, and Grey-faced Petrel. We have northern hemisphere visitors of the Arctic Skua and Pomanine Skua, where they have been recorded chasing White-fronted terns and robbing them of their prey during the summer months (A. Goodwin, pers. comm. 2005).

Table 3. (Source: A. Goodwin, pers. comm., 2005)

Migratory within NZ	**Details**	**Conservation Status**
Pied Oystercatcher	Breed south Island riverbeds & feed here during summer to winter	Common
Wrybill	Roost & feed Tokerau Beach.	Endangered NZ endemic
Banded Dotterel	Birds from south island join our locals over the non-breeding period	Moderately common

Black-Fronted Tern	Very rare visitor from south island and may roost with white-fronted terns.	Rare
Migratory from Northern Hemisphere (eg. Siberia, Alaska)		
Bar-tailed Godwit	These all need a safe undisturbed place to roost over high tide. Particularly seen at East Beach and Walker Island in Rangaunu estuary.	-
Lesser Knot		-
Turnstone		-
Greenshank	Rare visitors; more likely to visit marshy areas.	-
Marsh Sandpiper		-
Red-necked stint	Common international migrant in low numbers.	-
Sharp-tailed sandpiper		-

Table 4. (Source: A. Goodwin, pers. comm., 2005)

Resident & Breeding	Details	Known Breeding Locations	Known Feeding Locations	Conservation Status
Pied Shag	Almost exclusively coastal – needs undisturbed breeding colonies in trees	Matai Bay, Taipa estuary entrance, Butler Pt, Oneti Pt, Kaituna Bay, Brodies Creek, Cape Karikari, Waipapa Bay	Throughout	Moderately common
Little Shag	Often breeds with Pied shags, but also inland	Taipa estuary entrance, Cape Karikari, Waipapa Bay, Bulter Point	In tidal estuaries & up rivers	Common
Black Shag	Usually more solitary breeders	-	-	-
Little Black Shag	Hunts in ‘packs’; occurs in sheltered estuaries and tidal rivers	Probably with Pied Shags	Taipa estuary, Maori Pt, Mill Bay	Common
Reef Heron	Nests in rocky caves but occasionally on wharfs or negelected moored boats.	Butler Pt	Around rocky shores & tidal estuaries	Moderately common
White-Faced Heron	Nests inland in tall trees, pines etc.	Throughout	-	Common
Banded Rail	Mangrove swamps, nests in thick vegetation, sometimes also inland	Taipa estuary, Oruaiti River	Taipa River, Oruaiti River, Mangonui estuary	Threatened

Spur-winged Plover	Nests on farmland or open country, occasionally dunes. A successful Australian immigrant	-	-	Common
Variable Oystercatcher	Vulnerable to predation of nests above high water (HW) on beache an in sand dunes, or on shellbanks. Also sometimes on rocky islets. Also vulnerable to damage of nests by cars & bikes.	Waimango outlet, Wairahoraho Stream, Matai Bay, Waikato Bay, Karikari beach, Puwheke Beach, Tokerau Beach, Taemaro Bay, East Beach, Aurere estuary & sandspit	Beaches & estuaries throughout Area	Rare
Pied Stilt	Mainly nests inland on damp paddocks or open areas in swamps. A few nest on shoreline, near creek-mouths. Visitors from sourthern breeding areas, even south island add to summer population.	Wairahoraho Stream (1996), Waimango outlet, Tokerau Beach, Lake Ohia	Roost Paewhenua Island; feed Mangonui estuary, Taipa and Aurere estuary, Rangaunu estuary	Common
Banded Dotterel	A few pairs breed in coastal sand dunes, but most come north after breeding inland places like volcanic Plateau, Nationaal park, South Island for the non-breeding season	Wairahoraho Stream, dunes behind Karikari beach	Tokerau Beach sand dunes, Roost East Beach Rangaunu estuary	Common

NZ Dotterel	Need to protect this species urgently within the Area, especially safe nesting areas. Dangers include coastal development, damage to nests & chicks by vehicles, bikes, dogs; also predation by wild cats, nustelids, hedgehogs & black-backed gulls.	Matai Bay, Karikari Moana (Wairahoraho stream, (flocking site), Waimango outlet, Puwheke Beach, Walker Island Rangaunu estuary (very important site), Aurere (Awapoko River), Otengi, Takerau (Smokehouse) Bay, Taemaro Bay, Waimahana Bay	Roost East Beach Rangaunu estuary, roost Aurere sandspit, High Water roost Taipa rivermouth (odd birds only);Karikari Moana, Matai Bay, Puwheke Beach, East Beach, Rangaunu estuary	Threatened to Extinction
Black-backed Gull	A successful survivor. Nests on scattered rocky headlands & islands	Throughout Area on rocky headlands. Walker Island, Rangaunu estuary.		Common
Red-billed Gull	Nests on rock stacks or rocky headlands. Our local birds may be joined by some from huge colonies on Three Kings Islands.	150 pairs at Chucks Cove & “Pooh Bear Island” (Oct-Jan), Te Kura Rocks		Common
White-fronted Tern	Breed on rock stacks	Rock stacks off Matawherohia Point (Oct-Jan), Walker Island Rangaunu estuary (v. important site), Te Kura Rocks	Karikari Bay roost, Walker Island Rangaunu estuary (v. important site), Cable Bay& Coopers Beach roost sites.	Common
Little Blue Penguin	Breeds around the local rocky shores. Occasionally huge numbers die, by either disease or starvation.	Rangikapiti Head	-	Common
Gannet	Nearest breeding colony is on Ninepin at the northern entrance to the Bay of Islands.	-	Follows schooling fish	Common

Fluttering Shearwater	Don’t breed here and a few may breed on the outer Cavalli Islands (eg. Harakeke). Occassionally big flocks congregate in Doubtless Bay and off the entrance to Rangaunu estuary. 20-25,000 recorded in 1998. In April 2005, only 6000 recorded feding outside the breakers off Tokerau Beach	-	Tokerau Beach waters	Common
Caspian Tern	Worldwide distribution. Feeds on shoreline or up estuaries and even into freshwater.	Walker Island, Rangaunu estuary.	-	Moderately Common.

8. GAMEFISH & LARGE PELAGIC FISH

Gamefish and large pelagic fish are common in the Area and forms a popular seasonal recreational fishery. Such species that have been caught by local fishing club members can be seen in Table 5. Some species have become rare or are declining in areas that used to be abundant (eg. Cape Karikari). Mako and Blue sharks were once prolific in the Area but today are very rare (E. Mackay, pers. comm. 2005).

Table 5. Known gamefish and large pelagic fish caught in the Area

Species	Location caught
Skipjack tuna	Inside Doubtless Bay
Yellowfin tuna	Matai Bay, Doubtless Bay
Albacore tuna	Cape Karikari
Striped marlin (*Nukutaura*)	Cape Karikari, Doubtless Bay, Berghan Pt
Black marlin	Matai Bay, Cape Karikari
Blue marlin	Cape Karikari, Berghan Pt
Swordfish	Cape Karikari
Shortbill spearfish	Cape Karikari
Kingfish	Cape Karikari, Berghan Pt, Mangonui wharf, Doubtless Bay
Mahimahi	Cape Karikari

Some recognised 'bycatch' species in this fishery, include shortbilled spearfish, bigeye tuna, skipjack tuna, mahimahi, and wahoo.

Striped marlin seems to be the dominant fished species (Morrison 2005, J. Holdsworth, pers. comm.. 2005) with black marlin being captured in smaller numbers.

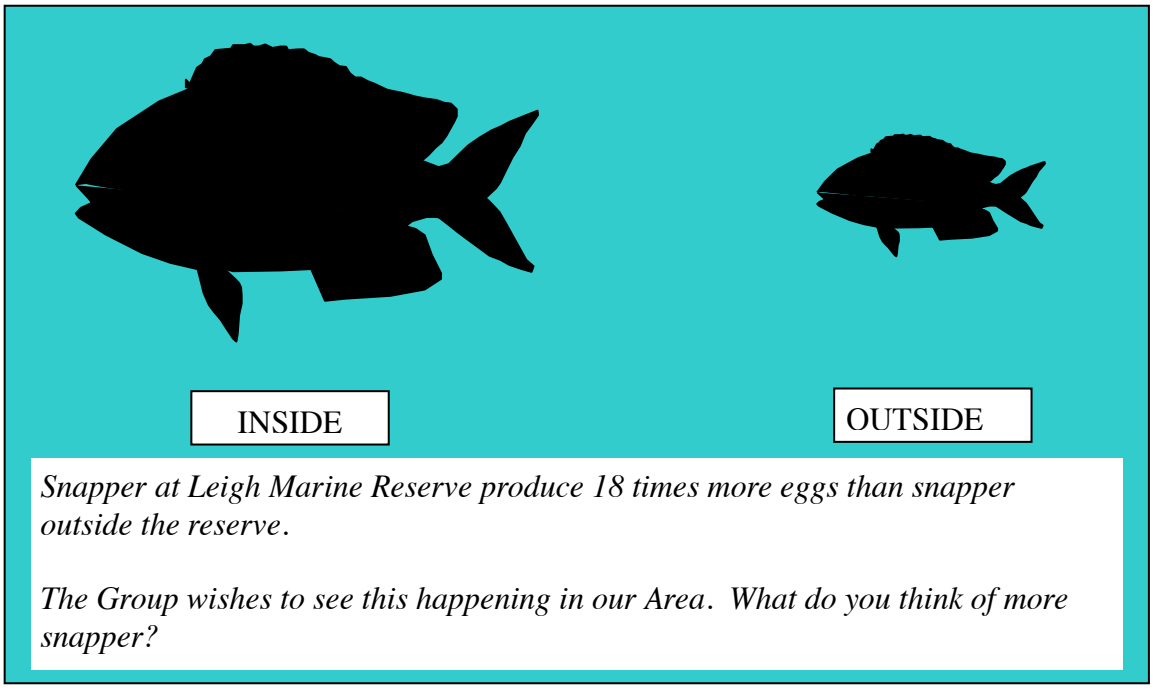
Sharks and rays are also common in the Bay. Mako sharks have been caught mainly off Berghan Pt and Knuckle Point. Also, blue shark, thresher shark and bronze whaler. Also grey nurse shark (Doubtless Bay). Spawning and nursery grounds of school shark, rig, bronze whaler, and hammerhead sharks are poorly known. Rangaunu estuary used to be a paricullarly large spawning ground for rig (Muriwhenua Fishing Report 1988).

Great white sharks and whale sharks have been observed in the Far North but only rarely (C. Duffy, pers. comm. 2005).

Eagle rays are usually seen associated with rocky reefs.

5. Benefits of No-take Marine Reserves

Appendix 2 outlines the benefits of marine reserves[7] in New Zealand and also internationally. Overall, New Zealand's no-take marine reserves have demonstrated large increases in abundance and size of exploited species such as snapper, red lobster, and blue cod inside marine reserves.



Snapper at Leigh Marine Reserve produce 18 times more eggs than snapper outside the reserve.

The Group wishes to see this happening in our Area. What do you think of more snapper?

Surprisingly, there have been indirect responses to protection from fishing. The recovery of snapper and rock lobster has created a trophic 'cascade-effect', where urchin-dominated barrens revert to highly productive kelp forests (Babcock, in press). This is a result of high trophic level predators returning to the food web.

The far north of the North Island has no marine reserves. The nearest is Poor Knights Islands off Tutukaka and two sites within Whangarei harbour (2.2% of the harbour).

Fisheries and No-take Marine Reserves

Globally, more than 40% of the world's marine fishery populations are heavily to fully exploited, with 25% classified as over-exploited, depleted or recovering. In the last decade, this high exploitation rate has led to the complete or partial collapse of many of the world's fisheries. As a result of this trend, no-take marine reserves have been recognised internationally as a management tool to halt the decline in marine biodiversity. (see www.nceas.ucsb.edu/Consensus,2001).

[7] No-take marine reserves are a defined area of the territorial sea, seabed and foreshore, which is managed for the purpose of preserving it in a natural state as the habitat of marine life for scientific study. They are: closed to all forms of fishing; closed to removal of any material – living, dead or mineral; closed to dumping; closed to extractive activities such as mining or dredging; open to well-managed, non-consumptive activities such as swimming, snorkelling, scuba-diving and wildlife watching; open to scientific research.

The role of marine reserves as fisheries tools is highly debated. Evidence of the benefits to fisheries, such as 'spillover' and larval supply, is thoroughly reviewed in Ward *et al* (2001) and concludes that such no-take areas will provide broad-ranging benefits that will extend beyond the fishery[8].

Evidence from New Zealand with the rock lobster and snapper, found that quite small no-take reserves, like Leigh (5km of coast), have potential to sustain recruitment in much larger portions of the coast[9].

Non-extractive Benefits
Non-extractive benefits have also been recorded from marine reserves. They can enhance economic opportunities; enhance social activities; create wilderness experiences; enhance educational opportunities; promote ecotourism, and create public awareness[10].

As Bill Ballantine, Founding Director Leigh Marine Laboratory points out we haven't even discovered half the fish in the sea. Only marine reserves can protect the things we haven't discovered yet. "Marine reserves are insurance against ignorance"

No-take marine reserves also allow us to learn about the marine environment in a natural state, without exploitation. A lot of what we know about New Zealand's marine environment has been possible through research in marine reserves (eg. rock lobster population dynamics; habitat structure without disturbance; snapper population dynamics, particularly site fidelity and reproduction and response to no fishing)[11].

Marine reserves as management tools
Marine reserves cannot work in isolation. They must be used in combination with other management tools so that benefits of no-take areas can work effectively to protect biodiversity, ecosystem structure, function and integrity; thus protecting marine resources.

No-take marine reserves are being established more and more internationally because of there benefits. The recent *Millennium Report* recommends that a network of fully protected marine reserves is required combined with a global elimination of bottom trawling.

Impacts on Commercial, Recreational and Cultural Fishers
Marine reserves are a highly topical issue amongst the fishing community. The biggest arguments from the opponents of marine reserves include:

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[8] For yield benefits also see Russ and Alcala 1996, Roberts *et al.* 2001; Sladek Nowlis & Roberts 1999

[9] See Kelly *et al* 2000, and Willis *et al* 2003.

[10] See Sobel & Dahlgren. 2004. Marine Reserves. A guide to science, design and use. The Ocean Conservancy. 384p.

[11] Babcock, R. in press. The New Zealand Marine Reserve Experience: the science behind the politics.

- *Quota Management System (QMS) is sufficient to protect the resource*.

The QMS has not been found to be sufficient to protect the resource (See *Commercial Fishery* section for further detail), because it hinges on the crucial assumption that the quota level is in fact set at the correct level. For example, snapper, our most studied and most commercially and recreationally important fish, the virgin biomass for SNA 8 is at a frightening 9% and SNA 1 about 18%. Fisheries management is more than establishing quota. The *Fisheries Act 1986* identifies that fisheries habitat and biodiversity also be managed sustainably[12]. Marine reserves combined with the QMS can ultimately achieve goals of conservation, ecosystem management and confirm sustainable fisheries.

THE MILLENNIUM REPORT

The UN Secretary General has established an advisory body called the UN Millennium Project, (http://www.milenniumassessment.org/en/products.aspx).

The report *Environmental Sustainability. Environment and human well-being: a practical strategy,* recommends that:

- *"Implement an ecosystem-based approach to fisheries management"*
- *"global fisheries authorities must agree to eliminate bottom trawling on the high seas by 2006 to protect seamounts and other ecologically sensitive habitats and to eliminate bottom trawling globally by 2010".*
- *"Having in place a network of representative, fully protected marine reserves that covers 10 percent of the oceans, with a long-term goal of 30 percent, is consistent with the 2012 target of the WSSD and more aggressive than the proposed CBD target on protection of marine areas."*

- *Marine reserves are a 'lock up'*.

Protecting, for example 5km of coast out of an EEZ size of 4 million sq km, is not a 'lock up' of fishery resources. Contrary to the belief of the opponents of marine reserves evidence suggests that marine reserves do not 'lock up' fisheries but do allow fish to cross reserve boundaries so they are available to the fishery. In addition, marine reserves in New Zealand have been found to not impact on fishery yields[13].

- *Displacement of fishing effort, therefore putting pressure on the fisheries*.

Displacement of fishing effort due to the establishment of marine reserves is a genuine concern for fishers and fisheries managers. However, evidence available on the modelling of no-take areas and the impact of effort displacement suggests that 40-80% of available habitat will need to be protected before an impact on unprotected areas by fishing occurs. However, you would have to assume that no fisheries management is implemented to handle this impact. Currently in New Zealand the aim of 10% of available habitat be protected by 2010, so there is no imminent threat of effort displacement impacts outside marine reserves.

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[12] *Fisheries Act 1996, Section 9, environmental principles* state: (a) associated and dependent species should be maintained above a level that ensures their long term viability; (b) biodiversity of the aquatic environment should be maintained; (c) habitat of particular significance for fisheries management should be protected.

[13] Bentley, N., McNeill, S.E., Davies, N.M. and Davies C.R. 2001. An example of assessing spatial closures as a fisheries management tool. 12 p. Draft Report to the New Zealand Ministry of Fisheries. And also see Kelly, S., Scott, D. and MacDiarmid, A.B. 2002. The value of a spillover fishery for spiny lobsters around a marine reserve in northern New Zealand. *Coastal Management* 30:153-166.

SOCIAL & ECONOMIC DESCRIPTION OF THE AREA

The following section gives a snapshot of the types of human use of the Doubtless Bay – Karikari Peninsula and offshore area. Unfortunately, the actual economic costs associated with human use of the marine environment in this area have never been documented, so has not been included here.

The types of human use occurring in the marine environment include commercial and recreational fishing, non-fishing uses such as boating competitions, marine tourism, swimming, no-take scuba-diving, kayaking and yachting.

The compatibility of theses uses on the ecological and cultural significance of the area has not been included here, but will be reported separately. However, certain literature on such compatibilities have been utilised to formulate the recommended management in the **Marine Issues & Proposed Actions** section of this Discussion Document.

1. Population Status

Doubtless Bay is a popular summer tourist (domestic and international) destination. Mainly due to its wide open spaces, pathway to the Cape, recreational fishing opportunities and scenic adventures (eg. gum fields, Tokerau Beach sand dunes).

The population size of Doubtless Bay –Karikari Peninsula area ranges between 1600 and 2000. The 2001 population census found that for the Taipa Bay–Mangonui district, the usual resident population is approximately 1600. This is a change of 6.2% since 1996. In comparison, the Far North District's population has changed by 3.1% and the population of New Zealand as a whole has changed by 3.3% since 1996.

The Taipa Bay–Mangonui population has been projected to change between 1.6% and 1.9% by 2006. In 2001, the unemployment rate for this area was 11.4%, compared with Far North District of 12.2% and 7.5% for all of New Zealand. Looking at the age of the population, 58.6% of the community is aged between 15-64, with 23.1% 65 years and older and 18.1% of people are under the age of 15 years. The ethnicity of the population that was censured in 2001, 84% said they belong to the European ethnic group, compared with 66.3% for the Far North District and 80.1% for all of New Zealand. 26% of the Taipa-Mangonui people are of Maori ethnicity.

2. The commercial fishery

NZ Fisheries Management

In New Zealand, all commercial fishing is governed by a quota management system (QMS), which was introduced in 1986. This system determines how much fish and what species each company or independent operator is entitled to catch.

Mangonui wharf, Mangonui estuary. (L. Makey)

Every year a Total Allowable Catch (TAC) is set by the Minister of Fisheries. The TAC takes account of recreational and customary fishing mortality and illegal take as well as commercial catch. This is to ensure that all fishing occurs sustainably. Fishing companies or independent operators buy an annual catch entitlement (ACE), which determines the amount of fish they may catch per annum.

The commercial component of the TAC is the total allowable commercial catch (TACC). This is divided into Individual Transferable Quota (ITQ) allocated to New Zealand commercial fishers. Having an ITQ allows a fisher to catch the specific proportion of the TACC.

The industry and Crown widely promotes that the QMS is a system achieving sustainable utilisation of fisheries resources. Being the one of a kind in the world, this property rights-based management system, has been trailed in other countries but not to the level it is achieved in NZ. Most fisheries are managed using 'input' controls, for example effort control, seasonal closures and gear restrictions, to sustainably manage the fishery.

However, the lack of environmental protection and the integration of ecosystem-based management principles have also been raised. The Parliamentary Commissioner for the Environment's 1999 report on the management of the marine environment concluded:

> *….there is little evidence yet to suggest that [the QMS] is delivering sustainable management of fish stocks or the marine ecosystems they inhabit…The dominance of the private property rights approach has, to differing extents, excluded the values and priorities of tangata whenua, recreational users, local residents groups and other concerned groups from policy and decision-making processes.*

A 1999 report on the performance of the Ministry by the Office of the Auditor-General (CA-G 1999) concluded:

the Ministry has been slow to commit resources to the environmental principles of the 1996 Act, given that it has been aware of those principles and their implications for some time.

The report also found:

…the Ministry manages most fish stocks without being sure if this management is sustainable… [it] is not able to make informed recommendations to the Minister on issues such as the effects of fishing on the marine environment and the inter-relationships of fish species.

Commercial Fishing in the Area

Information from the Ministry of Fisheries regarding commercial catch, effort and distribution was provided for an area bigger than Doubtless Bay (Figure 7). This was because there were less than 3 operators in the Bay, and this prevented the Ministry of releasing such commercially sensitive data. Information was provided on species, catch, effort and location between 1992 and 2004. Most of the information, except position information, was provided in averages, which is difficult to interpret. Also, 2000 to 2004 were pooled because of the same commercial sensitivities, so it is difficult to review any trends over time since 1992.

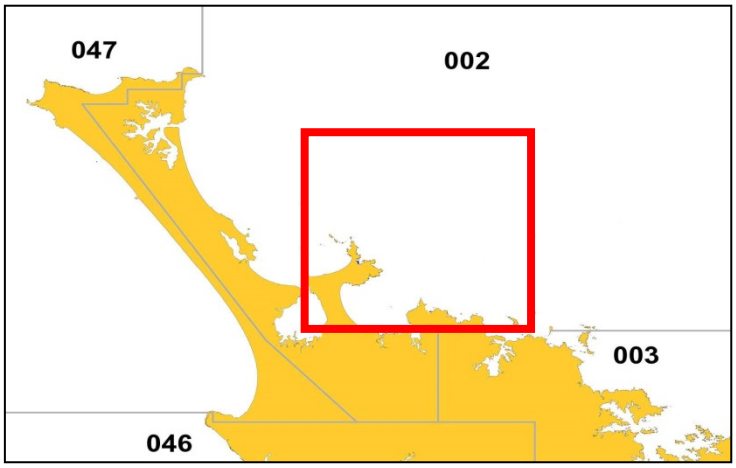


Figure 7. The red area indicates the information obtained on commercial fishing in Doubtless Bay, Mangonui estuary and outside Doubtless Bay. The black numbers indicate the Statistical Areas used by commercial fishers to record fishing catch (Source:

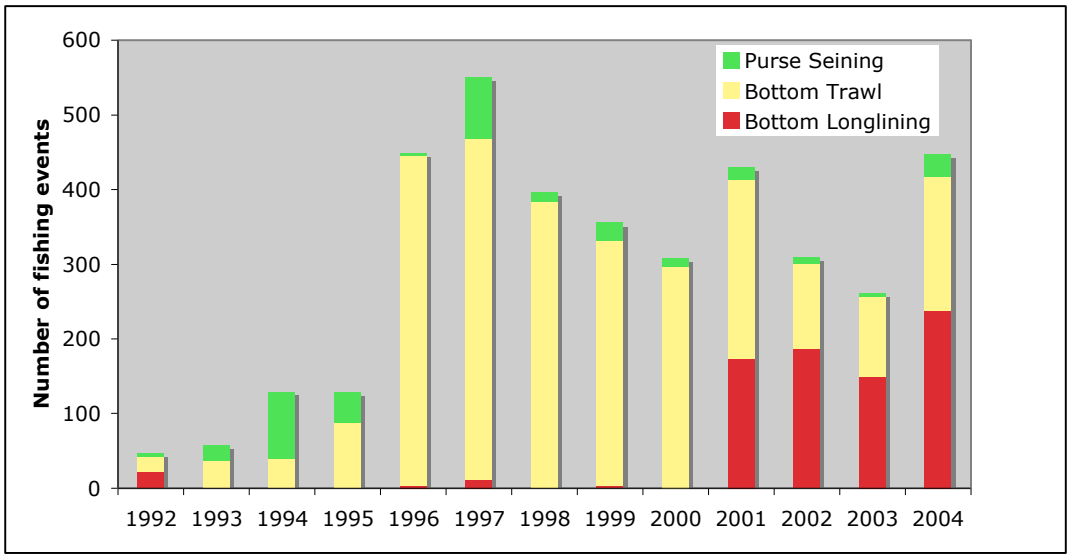
The Area supports a number of important commercial finfish species. Three to four local fishers concentrate their effort inside Doubtless Bay (mainly targeting snapper), and offshore Doubtless Bay especially during winter, to target snapper, trevally and tarakihi. The method mainly used by these fishers is bottom longlining (Figure 8).

Figure 8. Bottom longlining (Source www.seafic.co.nz)

Offshore, in deeper water, between 100-250 m, commercial vessels are targeting mackerel, skipjack tuna, snapper, tarakihi, hapuka and trevally. In water greater than 250m gemfish and hoki are mainly targeted.

The dominant method of fishing in the Area is bottom trawl, bottom longlining and purse seining (Figure 9). Bottom trawling has dominated through the 1990's and between 2000 and 2004, longlinging has now become a popular method of commercial fishing in the Area.

Figure 9. Number of fishing events for bottom trawling, bottom longlining and purse seining from



Between 1992 and 2004 the topmost commercially targeted species caught, by weight, were (Figures 10 and 11):

- jack and blue mackerel (both used for baitfish in longlining),
- skipjack tuna,
- gemfish,
- snapper,
- tarakihi and
- trevally.

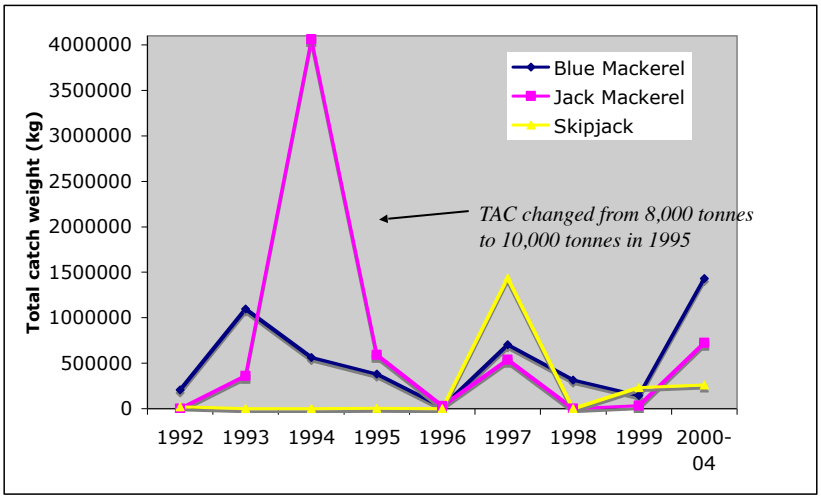


Figure 10. Total catch weight (kg) of commercially targeted blue and jack mackerel, and skipjack tuna. Please note that catch for 2000-2004 is pooled, so provides a false perspective into catch

Over 14,000 tonnes of jack mackerel was caught in 1994, which resulted in overall landings for JMA1 exceeding the TAC, by 6,000t. In 1995 the TAC was increased from 8,000t to 10,000t. For

snapper and tarakihi, catch has varied between 50 and 150t between 1992 and 1999.

Reviewing catch in more detail, using number of fishing events (ie. which means the number of fishing events targeting a certain species, like snapper. For example, in 1992 there were 29 fishing events where snapper was recorded to have been targeted), targeting tarakihi has dominated the fishing activity in the Area during 1992 to 2004 (Figure 12).

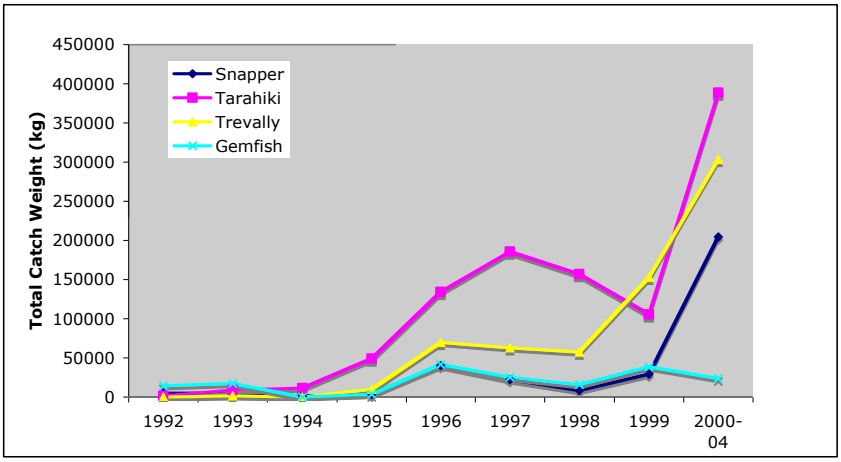
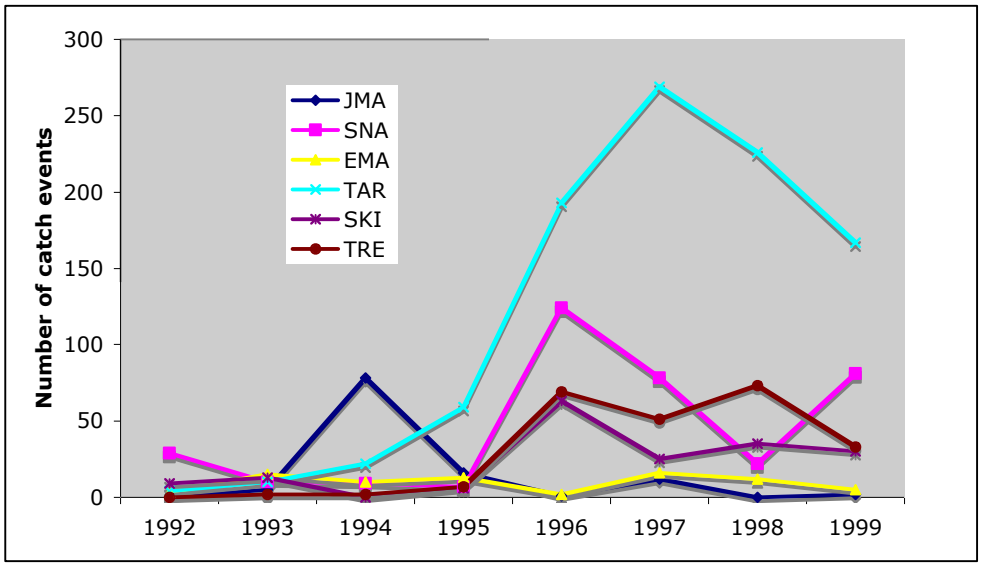


Figure 11. Total catch weight (kg) for snapper, tarakihi, trevally and gemfish from 1992 to 2004. Please note that for 2000-2004 catch is pooled, so provides a false perspective into catch trends for the Area.

Spatial analysis of trawling in the New Zealand EEZ has found that, offshore of Doubtless Bay, trawling effort for tarakihi, and possibly snapper, is a 'hotspot' (Dr. M. Cryer, pers. comm. 2005) (see Figure 10). This essentially means that from the spatial analysis, the mean area swept by a trawler was at least 15 to 25km^2 per year (based on doorspread rather than wingspread of a trawler).

Figure 12. Number of catch events for the top targeted species from the area. Years 2000-2004 are not included



So each bit of sediment was impacted by some part of a trawl net on average of one or more times each year.

Comparatively, outside of these 'hotspots' for trawling, fishing grounds are trawled once every other year.

Other trawling 'hotspots' in the far north is the west coast, adjacent to 90mile beach, where commercial trawl fishers are mainly targeting snapper.

More detailed information about catch levels for Statistical Area 2 or Fish Management Areas can be found in Ministry of Fisheries annual plenary reports (see http://www.fish.govt.nz).

The local commercial fishers land their fish at Mangonui wharf. The fishing company Moana Pacific Ltd have a processing plant on the Mangonui wharf and purchase up to 90% of the local fishers catch. In 2004 over 600t of commercially caught fish was landed at Mangonui wharf (Table 6).

Table 6. Total greenweight (t) of the top 10 species landed at Mangonui Wharf from 1990 to 2004. Note: these fish have been caught anywhere within NZ's EEZ or outside the EEZ. This information only gives an idea of types of fish and the amounts of fish being landed at this wharf. No estimate of economic value of this wharf has been calculated. (Source: Ministry of Fisheries)

Year	Total greenweight (t) of top 10 species landed at Mangonui wharf	Top two commercially targeted species landed at Mangonui wharf (Written in descending order by weight)
1990	514.7	Hapuka, Snapper
1995	733.8	Bluenose, Snapper
2000	874.5	Bluenose, Snapper
2004	673.9	Snapper, Albacore

Local Commercial Fishing Distribution

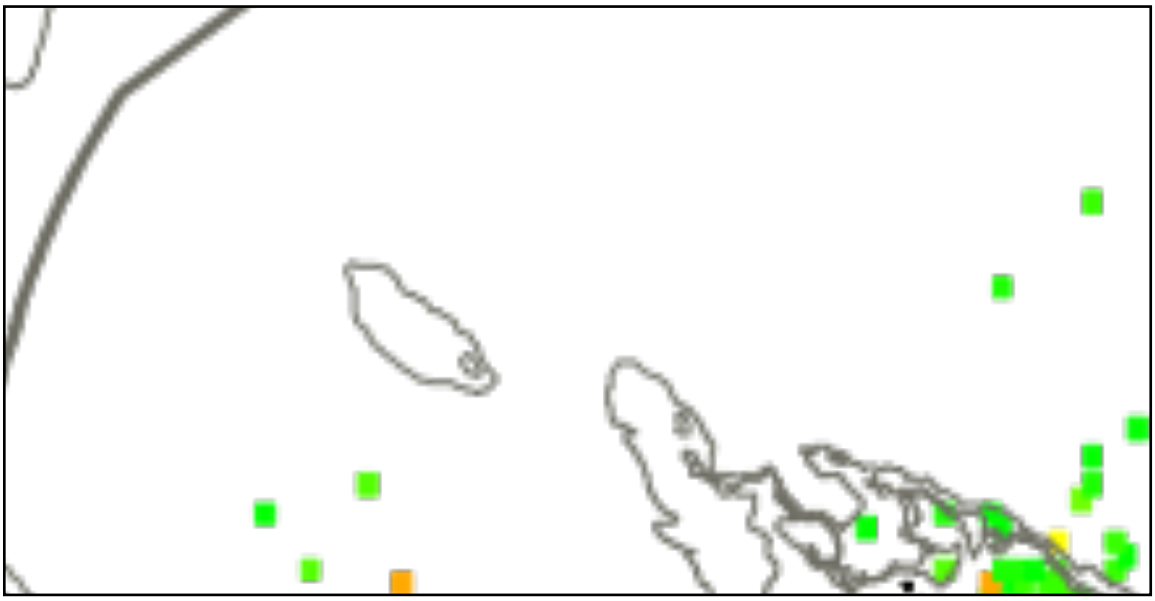


Figure 13. Distribution of trawling effort between 1989/90 and 1998/99 at a resolution of 3 minutes of

Figure 13 provides a snapshot of trawling effort in the Far North of the North Island. Trawling is only displayed here because the use of any type of commercial trawling gear, latitude and longitude information must be recorded in the Ministry of Fisheries catch return forms. Other methods of commercial fishing (eg. bottom longlining) only require the fisher to record statistical area.

Trawling occurs throughout the EEZ apart from a few closed areas (eg. seamounts, harbours and estuaries) or non-productive areas. Trawling occurred in Doubtless Bay prior to the closure in the early 1990s. As noted previously the red spots are 'hot spots' of trawling effort where trawl gear has moved across the seafloor once or more times a year, usually an area of 15 to 25km^2. These 'hotspots' occur within the 250m depth contour.

A more detailed analysis of trawling effort in the defined area (see Figure 7) will be provided at a later date.

Value of the Fishery

The value of the fishery to the local Mangonui community is unknown and has not been studied at such a localised scale.

However, New Zealand's combined commercial catch and aquaculture production is around 650,000 tonnes a year. In 2003, seafood exports were the 4th largest earner behind dairy, meat and forestry, with export revenues totaling $1.2 billion

(SeaFIC). Domestic sales are estimated to have remained static at less then $140 million annually for the last 5 years. In 2004, 337,800 tonnes of seafood were exported at a value of $NZ1.271 billion to New Zealand's economy.

Table 7 provides an overview of where some of New Zealand's fish are exported too.

Table 7. A list of species exported from New Zealand, their value and country of destination. (Source. SeaFIC and Forest & Bird)

Species	Value	Export Country
Tarakihi	$0.8 million	New Zealand and Australia.
Flatfish		New Zealand, Australia and Europe.
Snapper	$34 million in 2002	Japan was the single largest export market, taking around half. Europe & US biggest market today. Australia and Taiwan take some 30% between them.
Rock Lobster	$129 million in 2000.	Over 90% is exported "live" to Asian markets (Japan, Taiwan and Hong Kong).
Oreo's	$28 million in 2002	Key markets are the USA, Australia, Germany and Switzerland. The main market is for smooth oreos
Blue Mackerel	$8.3 million in 2002	Domestic
Jack Mackerel	$19.2 million in 2002	Domestic, Pacific Islands
Kahawai		Australia
Hapuka	$3.2 million in 1999	Domestic, Australia, Europe, US
Trevally	$7.5 million	New Zealand, Spain, Europe.
Scampi	$25 million in 2002	Europe, America, Asia, Africa
Hoki	$309 million in 2002	Most hoki is exported to the USA, Europe - including the UK and Belgium - Japan and Australia. The Fillet'o'Fish sold at McDonalds in New Zealand is hoki.
Orange Roughy	$127 million in 2002. Previously this was $200 million.	Orange roughy is one of the most valuable export fish species. Most is exported to the USA and Australia, and some to the UK where it is used by some fast food chains as fish fillet burgers. Some also sold in New Zealand, for example as frozen fish fillets.
Southern Bluefin Tuna	$42 million in 2002 (for all tuna species)	Japan, USA and Canada where it is highly prized for sashimi and sushi. Almost all large bluefins are shipped to Japan where they can fetch very high prices. An individual 444 pound bluefin sold for a record US$173,000 in Tokyo in 2001.

Environmental Impact of Fishing:

There is a worldwide acceptance that commercial fishing is having not only an impact on the target species but on non-target or bycatch species and communities. There has been a worldwide push from all levels of government and institutions, from the UN and European Union to governments of Britain, Australia and other European governments, to reverse the decline in fish numbers.

Bycatch:
One of the biggest problems facing governments, fisheries management agencies, other natural resource mangers and commercial fishing industries worldwide, other than sustainably managing a fish stock, is reduction of bycatch. Overwhelmingly amounts of evidence exist that demonstrates the impact of fishing on marine communities (Kenchington 2002, Dayton et al 1995; Thrush et al 1998; Poiner et al 1998).

Compared to other forms of fishing, trawling is generally found to generate the highest rate of bycatch. In some trawl fisheries the ratio of bycatch to target species can be as high as 8 or 10 to 1. For example, in Spirits Bay, bycatch was up to 9 times more than the trevally catch during the period1995-98 (Figure 14).

Bycatch includes large numbers of marine invertebrates, marine mammals and seabirds. In NZ, each year around 700-1,000 fur seals and 1,100 seabirds – mostly albatross species – are drowned in trawl nets.

There is so much bycatch mainly due to the large amounts of fishing gear "fishing" and most gear is non-selective, especially set nets and trawl nets. Some trawl nets are as big as the Cook Strait ferry, which are pulled through the ocean and indiscriminately trap, crush and usually kill everything in its path.

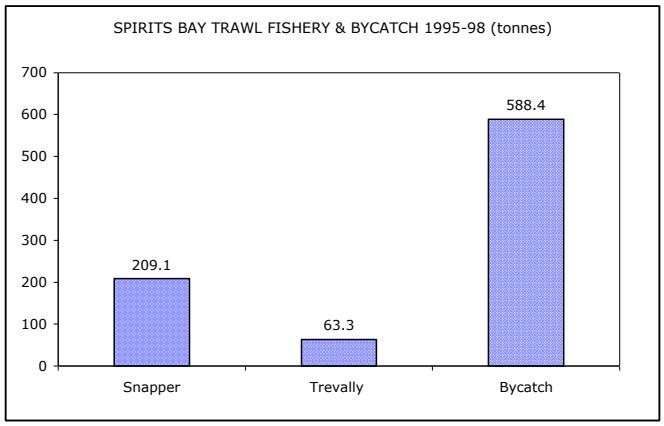


Figure 14. Spirits Bay trawl fishery and bycatch for 1995 to 1998. Trawling in Spirits Bay is now prohibited.

Impact of fishing gear:
Impacts caused by fishing gear, especially trawl and dredge gear, has scientifically been found to cause broad-scale changes to seafloor communities. Fishing does cause changes to seafloor habitats and communities by decreasing biodiversity and habitat complexity (ie. making seafloor the same) (Thrush et al 1995, 1998).


Orange Roughy trawler with a full net.

Other direct effects include the direct removal of species, resuspension of sediments, destruction of benthic communities and


A big otter board, used in a trawler to keep the trawl net apart while moving along the seafloor or midwater.

The commercial fishing industry is the main user of marine resources, and unfortunately we do not have detailed understanding of the environmental costs of its activities.

No trawling or dredging is allowed inside Doubtless Bay only outside the Bay, and can occur out to the EEZ and beyond.

Background Information of Some Popular Fish Species

Snapper (*Tamure*):

Pagrus auratus, Snapper, NZ's most popular and targeted fish and thus researched fish in the country. Unfortunately, Scientists and government still do not know the status of the population.

A long-lived species generally caught at depths of 10-100 metres. Distributed in the warmer coastal waters of the northern North Island and the Bay of Plenty, but can range to the north of the South Island.

Its maximum age is 60, maturing at 3-4 years old and is commercially exploited at 3-5 years. Are serial spawners (release egg batches over a season) during Spring-Summer.

Doubtless Bay commercial fishers fish in an area that is called SNA 1 (or snapper 1) (Figure 15) quota management area. It is believed that SNA 1 is being fished below a level that will sustain fishing mortality and is presently at a total population of about 16% of its original biomass. SNA 8 on the West Coast of the North Island, is at about 9% of its total population.

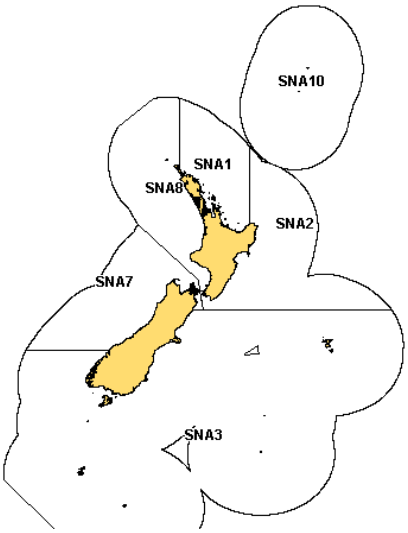


Figure 15. Snapper quota management areas. (Source: Ministry of Fisheries).

The 2004 snapper fishery plenary report states for SNA1 that it will take 20 years for the fishery to increase to near Bmsy[14] in the Hauraki Gulf/Bay of Plenty substock and to exceed the Bmsy in East Northland.

In summary, this fishery is being managed and fished below MSY. Other concerns with this fishery are the impacts of bottom trawling (Thrush et al 1998) and the bycatch of seabirds in the longline fishery and the lack of a management plan. In addition managing SNA1 as one stock not as two.

Hapuka (*Whapuku*) and Bass:

This deepwater species of groper and bass is mainly targeted by longlining in depths up to 400m. These long-lived species (live to 40-60 years) feed on blue cod, tarahiki, and hoki, are preyed upon by sperm whales. Juveniles are found in surface waters. Majority of commercial catch is caught off the East Coast of the North Island, Cook Strait, Kaikoura and the West Coast of the South Island.

These two species are managed as one and it has been found that they do migrate, possibly in relation to spawning. Spawning grounds are unknown and juveniles are very rarely caught as are believed to be pelagic and epi-pelagic and associated with drifting seaweed.

The 2004 Ministry of Fisheries Plenary report states that the current TACCs are larger than the maximum current yield (MCY) estimates and it is not known if they are sustainable or at levels that will allow the stocks to move towards a size that will support the maximum sustainable yield (MSY).

Kahawai:

A midwater predator this fish is also popular with New Zealand anglers. Is more common offshore but occurs frequently inshore including estuaries, bays and

[14] Bmsy is the recruited biomass that supports the maximum sustainable yield.

inlets. Juveniles form schools in shallow coastal bays and estuaries and adults move in large schools along shores where they can form large surface aggregations in deep water. Can enter freshwater to take bullies, eels, smelts and inanga (whitebait).

Predominantly, kahawai has a northern NZ distribution. Grows to 80cm, maximum age is 26 years and sexually matures at 5 and is commercially exploited at 3-4 years old (40cm). Kahawai usually spawn between March and April.

Kahawai is commercially purse-seined (Figure 16) which has seen a decrease in numbers. The status of this fishery is unknown. It is believed the biomass is currently at about 20% of virgin biomass, and was recorded to be at about 50% in 1996 when the last stock assessment was completed. The 2003 Ministry of Fisheries Plenary report on Kahawai states there may have been some decline in biomass. Recreational fishers believe the cause of the decline is the direct result of an expanding set net fishery and purse seining methods.

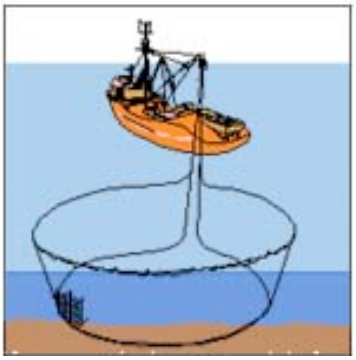


Figure 16. Purse seining

3. The recreational fishery

Recreational fishing is a popular past-time for local residents of the Area and occurs throughout the entire Area and further ashore. The Area also attracts numerous visiting fishers possibly for a variety of reasons. Boat based methods predominate compared to other forms such as kite fishing or surfcasting.

Photo L. Makey

The primary agency responsible for recreational fishing is Ministry of Fisheries. Recreational fishing is controlled using amateur fishing regulations[15] where bag limits, gear and species restrictions apply. An allowance is made for the recreational fishery when setting the TAC unlike the commercial fishery where a specific amount of quota is set by the Minister. Measuring if the recreational fishery is exceeding their allowance is difficult as there is no licencing requirement and recreational fishing surveys are not constant across species or time. Estimates of recreational take are usually used to assist in setting the TAC.

About 500,000 – 600,000 New Zealanders go recreational fishing at least once a year and many consider it their birthright. But it is important to acknowledge that with the right to fish, should come the responsibility to manage recreational fishing for the sake of future generations.

Incentives for recreational fishers to sustainably manage fisheries resources are non-existent compared to the commercial industry (which have property rights) and customary fishers, who have specific regulations for tangata whenua to co-operate in the management of commercial fisheries and to manage customary fisheries (eg. taiapure and mataitai).

The Group is currently completing a user survey of the Area to determine the level of recreational fishing effort, type of catch and distribution of effort. This information is collected using a temporally, stratified random sampling design. This is so we could assess the highly variable nature of recreational fishing in the Area. This is a similar sampling design to that being used at the North Island scale by NIWA. The user survey will be completed in December 2005.

From our observations we have found that:

- Snapper is the main target species
- Main type of vessel used is trailer boat
- Most popular method of fishing is baitfishing
- Most effort is concentrated around population centres (ie. Mill Bay, Mangonui)
- Most fishing effort is happening in summer and at weekends rather than week days and winter.

[15] See Ministry of Fisheries. 2004. A guide to New Zealand's marine recreaitonal fishing rults. Auckland and Kermadec Fishery Management Area (includes Northland, Waikato and Bay of Plenty). Effective from April 2004.

These observations are consistent with what is being recorded by NIWA during their annual survey throughout Northland and the Hauraki Gulf (Hartill, pers. comm., 2005).

Research on Northland's recreational fisheries began in 1990, during which a boat ramp survey was used to collect information on fishing effort, catch and catch rates. NIWA has commenced an extensive annual survey to collect further information about recreational fishing in the Hauraki Gulf and the northeastern coast of NZ. Harvest estimates from this survey for snapper and kahawai and possibly other species, will be available in June 2006. Table 8 provides some examples of recent harvest estimates of popular recreationally targeted species in the Area.

The snapper fishery is the largest recreational fishery in New Zealand especially on both west and east coasts of the North Island. Kahawai and kingfish are the next targeted but at a much lesser extent.

Doubtless Bay has several fishing clubs with each having monthly, bimonthly or annual competitions. Some competitions occur over 2-3 days or up to a week (eg. Doubtless Bay Sportfishing Club Marlin Classic). Table 9 provides an idea of the extent of the number of competitions and species targeted. Almost all of the competitions occur inside the Area of Interest.

There are 2-3 charter fishing operations based out of Mangonui. Charter operations usually provide gear, bait, knowledge of fishing 'hot spots' and advice. Operations are dependent on demand and weather. Charter fishing operations have serviced the Doubtless Bay area for over 15 years.

A large gamefish fishery also exists in the Area mainly targeting striped marlin, kingfish and yellowfin tuna. A popular spot for capturing gamefish is Cape Karikari (Whakapouaka). Ministry of Fisheries is currently studying the characteristics of the recreational gamefish fishery. The Bay of Islands north to the Cape, supports the largest annual catches within New Zealand for tuna, kingfish, billfish and shark. Males dominant this fishery rather than females, with a higher proportion of the fishers having 0-5 years billfishing experience.

*Table 8. Recent estimates of recreational catch for popular recreational targeted fish species in the Area. * These surveys have used various telephone/diary survey methods to estimate catch but the results from these surveys are now considered unreliable, especially in relatively unpopulated areas such as the Far North.*

Species	**Catch (t)**	**Source***
Snapper (SNA1)	6738 (East Northland 1669 t; Hauraki Gulf 3507 t)	2000-01 National telephone & diary survey
Kahawai (KAH 1)	960	1996 National Survey
Hapuku (HPB 1)	209-476	1999/2000 National Diary Survey

Trevally (TRE 1)	230	1996 National Survey
Flounder (FLA 1)	200-330	1999/2000 National Diary Survey

Table 9. Estimates and frequency of fishing competitions in the Area between July 2004 and June 2005.

DATE	COMPETITION	WEIGHT (kg)	Location	FREQUENCY	SOURCE
Feb-April 2004	Karikari Kitefishing Club	242	Tokerau Beach	Every year	E. Mackay G. Nicholson
21-28 Feb-2004	Doubtless Bay Sportfishing Club - Nationals				
Dec 2004	NZ Kite Fishing Comp.			Once	E. Mackay G. Nicholson
Jan 2005	Lions Fishing Club Comp.		Ahipara-Whangaroa	Every year	B. Campbell D. Shalders
Jan 2005	National Spear Fishing Comp		Moturoa Islands Berghan Point Rangiputa		G. Cullen
Jan 2005	Light Line & Rod Club – Monthly Comp.				
March 2004/ Feb 2005	Doubtless Bay Sportfishing Club – Ladies Open				
Feb 2005	Light Line & Rod Club – monthly comp.				
April 2004 & March/April 2005	Doubtless Bay Sportfishing Club – Marlin Classic				
March 2005	Light Line & Rod Club – Monthly Comp.				
April 2005	Light Line & Rod Club – Monthly Comp.				

May 2004 & May 2005	Doubtless Bay Sportfishing Club – Kingfish Open				
June 2005	Doubtless Bay Light Line & Rod Fishing Club				
August 2004 & August 2005	Doubtless Bay Sportfishing Club – Spring Open				

Recreational Fishery effort and distribution for the Area
(NEED THIS DONE)

4. Customary Fishing

Please see the section *Cultural Significance of the Area* for details about customary fishing in the Area.

5. The non-fishing activity

Other direct uses in the Area, which are not fishing, are also popular. These uses fall into the following categories:

- **Recreation** (tourism - 2-3 sightseeing charter operations; 2-3 yacht clubs, swimming, wildlife photography, sailing, 2 scuba diving charter operations)
- **Science and education** (3-4 schools of the Area have been involved with the *Experiencing Marine Reserves* program; scientific research has over several decades occurred in the Area, especially Karikari Peninsula with its visitors of subtropical marine fauna).
- **Intrinsic Value** (From previous studies of visitors to the marine environment it has been found that people also value the sea just for its existence without any intention to directly exploit the resource. Essentially this is known as an **intrinsic natural value**. This type of value would include the worth of wildlife species, natural areas and overall biodiversity as having intrinsic value and stewardship value).

Doubtless Bay has 2-3 yacht clubs[16] that have regatta and general enjoyment competitions every month. In February 2005, Taipa Boating Club was the host to the national P-class competition. Over 4 days there was up to 200 boats on the water. The Mangonui Cruising Club has weekly and monthly competitions, mainly during summer, and for the 2004/05 season, 815 yacht hours were recorded for the Club.

[16] Mangonui Cruising Club; Taipa Sailing Club; (NEED THESE)

From the Groups user survey we have observed the following activities:

- Swimming at beach – occurs throughout Area and is probably the biggest non-fishing activity in the Area.
- Yachting – depending on weather, popular anchorage are Maitai Bay, Brodies Creek, Whatuwhiwhi and Mangonui estuary.
- Scuba diving – occurs throughout Area. Matai Pinnacle, adjacent to Matai Bay, was rated one of the top 10 dive sites in the world by the Lonely Planet Guide for Scuba Diving.
- Kayaking – occurs throughout Area but is popular at Matai Bay and Waikato Bay
- Coastal walking – includes tramping through crown land and along beaches
- Beachcombing – collecting shells or beach debris occurs at all beaches in Area
- Shellfish collecting – cockles in Taipa estuary; green mussels from the rocks of Taipa and Mangonui estuaries.

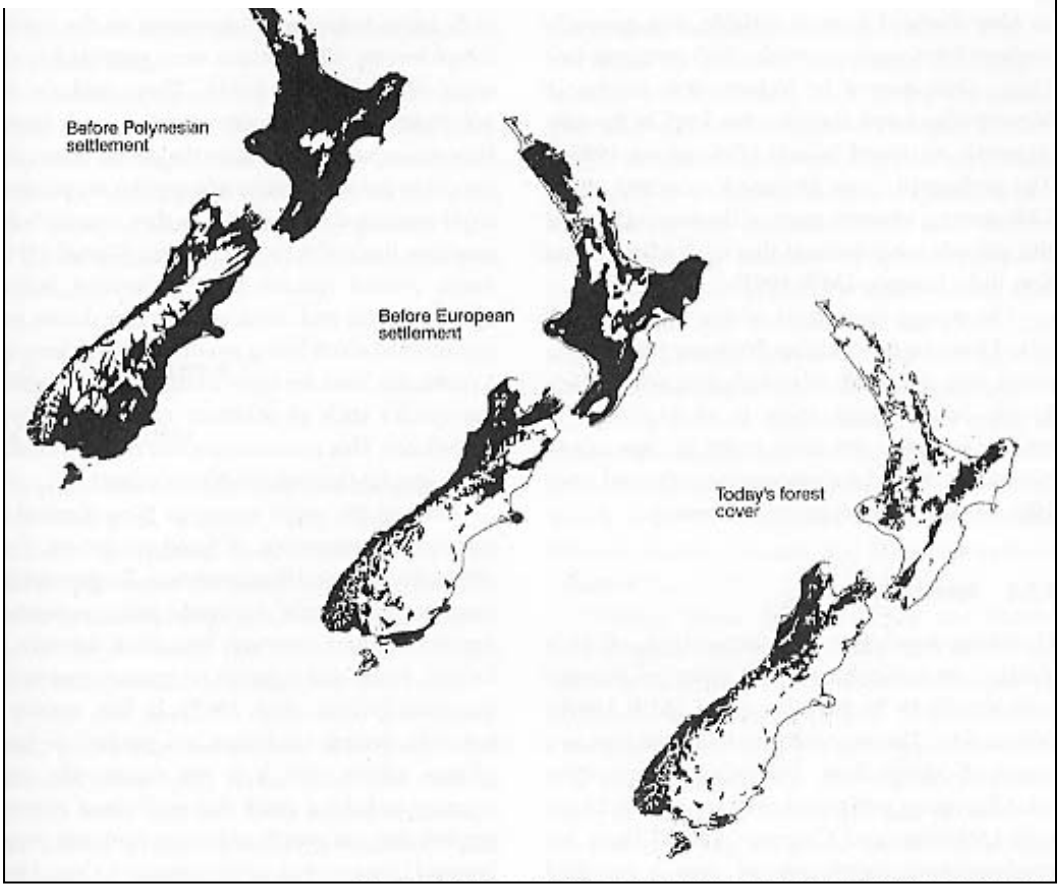
This type of information will also help to understand the various values and uses the marine environment has to people. It will also help formulate appropriate management that will both be sustainable for future generations and reduce the number of impacts on peoples' use of the marine environment.

6. Upstream Use – Land Use and Water Quality

The majority of landuse around the Area is farming (eg. cattle, sheep, cows) with a small population centre around Mangonui estuary. Other land use includes plantation forests, horticulture (eg. olive groves), conservation land (eg. Karikari Peninsula) and some coastal developments (eg. Carrington Resort; Whatuwhiwhi and Cable Bay residential developments). Like many coastal townships of New Zealand, Doubtless Bay and Karikari Peninsula are experiencing coastal development. This is mainly in the form of residential housing and lifestyle blocks, rather than high density buildings such as apartment towers. All housing in the Area requires tank water and septic tank systems.

The Doubtless Bay – Karikari Peninsula area has been protected from rapid coastal development compared to other coastal townships of New Zealand (eg. Mount Manganui, Raglan, Pauanui). This may be result of its isolation in the Far North and driving distance from Auckland. However, the Mangonui-Tapia area is now experiencing rapid growth in population size compared to the growth in the Far North District and New Zealand (see http://www2.stats.govt.nz/domino/external/Web/CommProfiles.nsf) .

Figure 17. Forest cover before maori and Europeans, and forest cover today. (Source: van Roon & Knight 2004; NZBS 2000)



Like many other catchments in New Zealand significant land clearing and other modifications to the land has occurred (Anderson et al 1984, van Roon & Knight 2004; NZBS 2000) (Figure 17). 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 (Anderson et al 1984).

The size of the Areas catchments is XXXXX. It extends from XX to XX.

Why is Upstream Use an issue?

Upstream use affects what is happening in the sea. Every waterway, drain, stream, creek, river and estuary leads to the sea. What it carries also ends up and accumulates in the sea. For example, the daily washing out of diary shed wastes generates large quantities of sewage and is flushed into waterways if not treated on site. Farming is the single greatest source of nutrients to New Zealand's receiving waterways (van Roon & Knight 2004). Modification to the land also has increased sedimentation in our estuaries

Runoff = Nitrogen & Phosphorous

"150,000 tonnes of phosphorous (P) and 90,000 tonnes of nitrogen (N) is applied annually to pastoral land, mainly to grow clover and grasses. About 40% of P is lost through run-off, so there is a continuing need to import P fertiliser to sustain agricultural productivity (van Roon & Knight 2004)".

Farming increases the transfer of P to waterways compared to other forms of landuse.

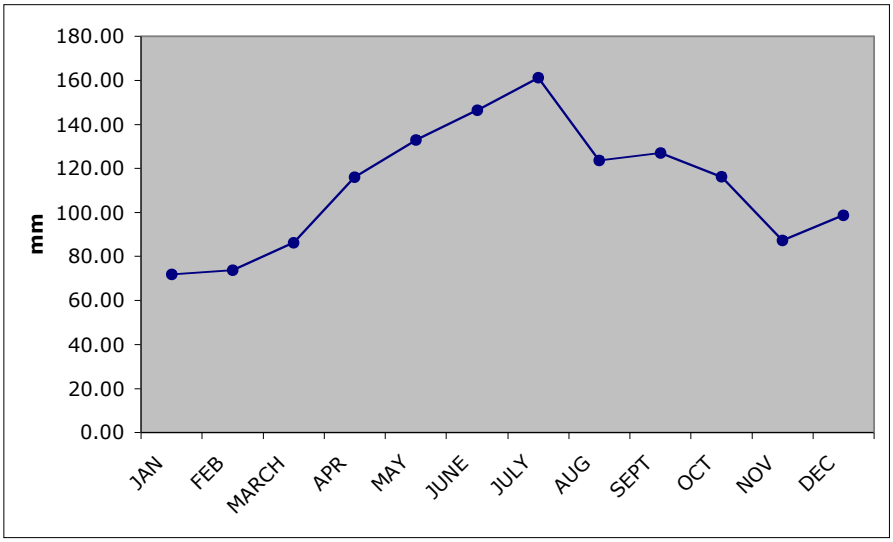
75% of total N in waterways is likely to come from farming land (MfE 1997).

A study of 49 rivers in NZ illustrated how farming degrades water quality, especially through elevation of sediments and dissolved phosphate; flows are turbid and nitrate N levels

and so our coast, and is showing no sign of abatement (D. Pankhurst, H. Matiu, R. Lloyd, pers. comm. 2005).

Sediment is carried to our estuaries through 'run-off', which has increased significantly in concentration and volume with increasing modification of the land. With every heavy rainfall event large amounts of sediment (that has been eroded from the land) and other contaminants (eg. nutrients from fertilisers applied to pastoral land and bacteria from animal excrement) flow into our estuaries and coastline. Heavy rainfall occurs about July-August in Doubtless Bay with average rainfall of 161mm, and the driest month is January-February with average rainfall of 71mm (Figure 18). Mean annual rainfall is 1340mm. The area does experience occasional summer droughts, and may also receive very heavy falls of rain, especially from tropical cyclones (Dept. Lands & Survey 1979).

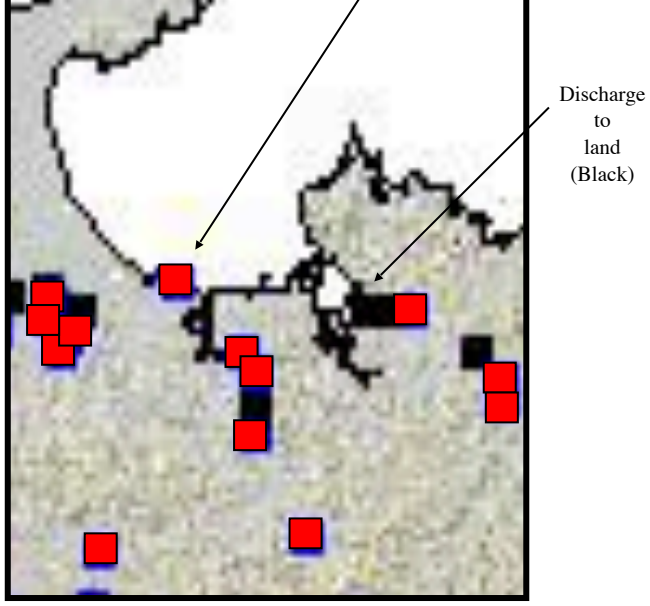
Figure 18. Average monthly rainfall between 1993-2004 (Source: D. Panckhurst)



Land use and processes affecting the sea in our Area have been identified as (see Northland Regional Coastal Plan 2004):

- Point-source discharges:
  - Discharges from outlets and drains (eg. stormwater drains, cooling water, sewage) (Figure 19).
  - Discharge from boats mainly effluent and ballast[17]
- Non-point source discharges:
  - Runoff from farms which releases nutrients (mainly nitrogen and phosphorus),
  - leaking septic tanks.
  - Stormwater runoff from catchments carrying mixture of rainfall, pollutants such as organic matter, sediment, and road surface accumulations, carrying contaminants including zinc, copper, PCBs, organochlorins and hydrocarbons.

[17] Ballast discharge is when ships discharge water to maintain stability after moving into waters of different densities or loading cargo.



- Roading developments, forestry clearance and subdivisions which carry sediment and soil into streams and estuaries.

Determining the environmental effects of non-point source discharges is a continuing headache. We do know that non-point source discharges within the catchment do cause cumulative impacts on downstream ecosystem health and biodiversity. Addressing cumulative impacts is being addressed, especially in Australian river management and landbased aquaculture (eg. prawn farms) (Makey, pers. comm. 2005). System and species indicators are being used to assess cumulative impacts on downstream ecosystems.

Controlling the amount of sedimentation that enters catchment waterways and so to our coastline is the responsibility of the *Resource Management Act* and the Northland Coastal Plan 2004. However, setting water quality targets for the catchments has yet to be done, where targets are set on the total amount of discharge of sedimentation (this should include total nitrogen export and total phosphorous export).

Other initiatives, such as riparian planting of estuaries and rivers, do not occur in the Area. Evidence of doing such activities (eg. Whaingaroa estuary, Raglan) in New Zealand and overseas, has found significant reduction in sedimentation, improvement in water quality and fisheries habitat. Fencing riparian strips have been found to reduce P input to a lake by 50% in a pastoral catchment. N removal by riparian vegetation has been shown to exceed 90%[18].

Water Quality

The Northland Regional Council monitors the water quality looking for particular contaminants that will affect our shellfish and bathing in the sea. However, they do not monitor the overall effect of sedimentation on biodiversity in our estuaries, particularly benthic and soft sediment organisms.

Water Quality and Cultural Significance

Water quality is very important to Maori. It is vital for sustaining life. Every waterway or body of water has its own source of life, mauri. It is believed that mixing of water or separation or division of natural systems can markedly affect the mauri of many places. Maori focus on keeping all parts the natural environment pure, unpolluted and connected.

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[18] More ideas on how to manage waterways and to reduce nutrient runoff to waterways see *Mfe. 2001. Managing Waterways on Farms. A guide to sustainable water and riparian management in rural New Zealand. Ministry of the Environment, Wellington. 212 p.* (http://www.mfe.govt.nz).

MARINE ISSUES & PROPOSED ACTIONS

The Group has focused on several issues over the past three years. They include *Fisheries, Marine Conservation, Expressing Kaitiakitanga, Water Quality, Local Catchment Management, Education & Socio-Economic Opportunities*.

Water Quality

Healthy waterways is a key value for the Group and thus has been identified as a key issue for the Area.

Water quality is about measuring different parameters such as temperature, oxygen, ammonia, phosphorous and nitrogen. Water pollution is measured used these parameters but it is very hard to determine if we have good water quality because we have no reference sites (eg. pristine areas) or data before land modification begun.

We do know that good water quality is vital for healthy well functioning marine ecosystems.

Communities benefit from good water quality to sail on, swim in, fish, gather shellfish from or simply admire the view.

Economically, maintaining good water quality is important for life, commercial

LACK OF EDUCATION & SOCIO-ECONOMIC OPPORTUNITIES

About the Issue:

Over three years of meetings, Group participants have voiced their concern about the lack of marine areas their children and students can visit to enjoy and observe a totally natural, unmodified marine environment. Participants have also discussed the issue of the lack of marine socio-economic opportunities that are not solely about fishing.

With a 6.2% population growth rate, expansion of coastal residential development and many visitors attracted to the area, especially during summer, are all signs of increasing needs on marine resources and the environment. The Group believes that having areas set aside for marine education will have socio-economic spin-offs for the wider community. Education is also vital to expressing kaitiakitanga. The Group believes that 'hands-on' experiences in marine education (eg. Experiencing Marine Reserves program (see http://www.emr.org.nz) significantly benefits people awareness of the function and issues facing the marine environment, compared to just reading a book or having a poster.

Leigh marine reserve (B. Ballantine).

State of Marine Education and Socio-Economic Opportunities in the Area

Peria Area School (Year 7 and 8), Taipa Area School (Year 7, 8 and 12) and Te Kura Kaupapa Maori O Rangiawhia have all been involved with the experiencing marine reserves program, and have all learnt values of protecting the marine environment (S. Sutherland, pers. comm. 2004). No other locally based marine education occurs where students can visit sites to form 'care' groups or 'adopt-a' programs.

With over 100,000 visitors to Leigh (Goat Island) marine reserve annually, there has been socio-economic opportunities arise. This is in the form of hotels/motels, ecotourism (eg. glass-bottom boats, kayak hire), scuba diving charters and scuba diving and snorkel gear equipment and hire outlets, restaurants and cafes.

Residents and local business people of Leigh believe the community would be economically worse off without the reserve[19]. For Leigh all retail businesses obtain a substantial portion of trade from visitors to the reserve, primarily over the summer months. Almost unanimous support for the marine reserve from residents and most visitors and local businesses support the reserve.

The US Department of Commerce suggests that the substantial social and economic benefits derived from marine reserves may even exceed the extractive uses of marine reserves. Similar results have been observed in Australia. In 1991-92, tourism at the Great Barrier Reef World Heritage Area earned $682 million[20]. Only 5 percent of the 343,500km^2 reef was a no-take area, while the remainder was zoned multi-use. In the same period, commercial fishing on the reef earned $128 million, private boating and fishing $94 million and research $19 million. Together the value of these activities was estimated at close to $1 billion per annum, while government expenditure on management was $18.1 million. In 2002, the Australian Commonwealth Government announced its support for at least 25% of the reef to be included in the no-take area. The GBR tourism industry is valued at $539 million compared to fishing industry with $130.1 million. The increase in protection is expected to deliver substantial net benefits to Queensland and all Australians[21].

Comments from local students about experiencing marine reserves

"*I think Goat Island marine reserve is a really great example of how marine life should be cared for and treated for. Without marine reserves a fish population may be gone forever, so remember marine reserves all the way"* Danielle Campbell.

"*I reckon we should have more marine reserves around NZ because the younger kids of today won't be able to see fish like [in] the old days and little kids will not know what they really are"* Janessa Henderson.

"*The fish are more bigger and better. They are friendlier. We learnt more about the fish in 2 days than I have in my life. Plus there are more fish for our future generations. So I leave you with an idea of a marine reserve in the Far North"* Morgan Backhouse-Smith.

"*Thre is more sea life in marine reserves than out of them. I think we should get more marine reserves in our country so that the next generation can experience the sea life like us"* Nirvana Van Stratum-Jackson.

"*Seeing the fishing boats lingering outside the boundaries of the Leigh marine reserve shows how important it must be. As Dr Bill Ballantine says, if people are so against it, why is it so popular….we need marine reserves*" Kent Simpson, Teacher Peria

[19] See Cocklin & Flood 1992. The socio-economic implications of establishing a marine reserve at Leigh.

[20] Driml, S 1994 Protection for Profit – Economic and financial values of the Great Barrier Reef World Heritage Area and other protected areas. Great Barrier Reef Marine Park Authority

[21] Hand, T. 2003. An economic and social evaluation of implementing the representative areas program by rezoning the Great Barrier Reef Marine Park. Report on the revised zoning plan. Report prepared by PDP Australia Pty Ltd. 88 pages.

The economic value provided from New Zealand's marine reserves is currently being estimated by the Department of Conservation.

Proposed Solutions

Desired Outcome:
Present and future generations visit the sea and see a marine ecosystem with its integrity intact and learn about the role of ecology in human existence.

Goal	Action
Promote education and socio-economic opportunities	• Prepare an ongoing public awareness campaign to inform and educate the community, not just schools but users, about the marine environment. • In collaboration with local schools identify, create and protect marine super sites in Doubtless Bay and the Far North, which will include no-take areas and estuarine habitats. • Encourage young environmental stewards to participate in all aspects of local monitoring and the control of marine environment. • Report on the economic advantages and disadvantages of no-take areas to the local economy. • Support any development of economic opportunities that will clearly and directly benefit present and future generations and the integrity of the marine environment (eg. MarineWatch).

HAVE YOUR SAY
Please read the background information. The Group welcomes your comments on issues ra
Discussion Document and the proposed actions. Do you think socio-economic and educatio
opportunities will benefit you, your whanau and your community?

DECLINING FISH STOCKS

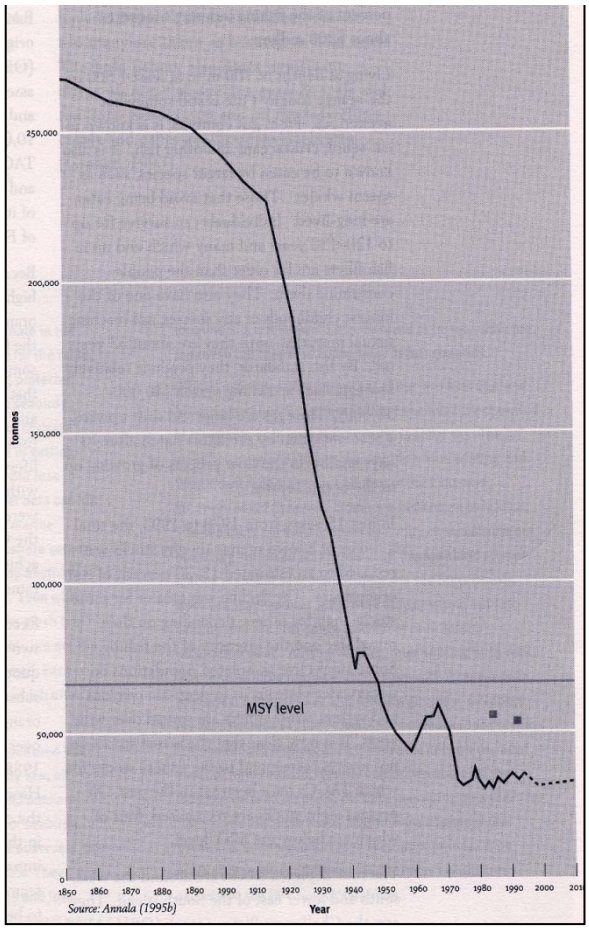
About the Issue

Local anecdotal observations of fishing, diving and using the coastal marine area, verify that changes have occurred. Fish stocks are not abundant in areas like they used to be, for example, Mangonui estuary used to be "*red with snapper tails*"; kingfish have virtually disappeared from Mangonui estuary due to the "*explosive*" increase in commercial set netting in Doubtless Bay during the 1990s. People may still catch the odd kingfish but "*not like they used too*".

Signs of growing scarcity are everywhere: fish are getting smaller, as are catches. Some fishing grounds are seriously depleted that they may never fully recover.

New Zealand's *Fisheries Act 1996* requires that fish stocks be utilised in a sustainable manner. This means sustaining target fish stocks while also sustaining marine ecosystems and non-target species. Most target stocks are harvested at rates that aim to maintain them at or near the level that produces the maximum sustainable yield. Establishing quota is the main method of stock management, which is achieved through the quota management system (QMS).

Figure 20. Snapper SNA1 fish stock showing the decline to below MSY. Dots represent tagging experiments to better quantify the stock size (Source. State of the Environment Report 1999).



The QMS hinges on the crucial assumption that the quota level is in fact set at the right level. As has been the case with all other attempts to manage fisheries, it is becoming apparent that we do not always have perfect knowledge of fish stocks that will allow us to set quotas correctly. The status of more than half the commercially exploited fish stocks is unknown but, of the stocks whose status is known, about 10 percent are considered to be below the level of maximum sustainable yield (Annala et al 2001, PCE 1999). For example, the

SNA 1 snapper stocks have declined to less than 16% of their original biomass (Figure 20) and now SNA 8 stocks on the west coast of upper north island has been reduced to 8-9%. So when you are fishing next be aware that only 16% of snapper are left on the east coast of the north island.

The type of fishing method used also has a direct impact on marine organisms and habitats, and bycatch of non-target species, including marine mammals and seabirds.

The extent to which recreational and illegal fishing impacts on fish stocks and marine ecosystems is unknown.

We all know our fishery could be managed better. Whatever your reason we must ensure that the full range of fish stocks are replenished to a level that will maintain ecosystem integrity rather than collapse; and habitats are protected for future generations.

Status of Fish Stocks in the Area

Current knowledge of the state of our fisheries is poor. Of the 236 commercial fish stocks[22] currently managed by the QMS, the size of the fish stock population is known for only 15%.

Where information is available, the news is not good. Half of the 35 fish stocks, for which population estimates are available, are known to be depleted below sustainable levels. See Table 10 for a summary of the population status of some commercially and recreationally important fish species.

*Table 10. Year of the last stock assessment of popular angling and commercially targeted species in the Area. (Source Ministry of Fisheries 2004 Plenary Report). *indicates main area for commercial fishing of that species.*

Species	Status	Population Size	2003/04 TACC (t)	Landings (t)	Year of last biomass assessment
Snapper (SNA 1*)	Depleted	16% virgin biomass	4500	4466	1995
Scallop (SCA 1)	Declining	-			2003 (Northland substock)
Mullet (GMU 1*)	Uncertain	Unknown	925	791	None

[22] A fish stock is a genetically-distinct group of the same species. For example, the NZ commercial snapper population has 6 fish stocks. For SNA 1 stock there are two substocks – Hauraki Gulf/Bay of Plenty and East Northland.

Yellow-eyed Mullet (YEM 1)	Unknown	Unknown	20	9	None
Flounder (FLA 1)	Unknown	Unknown	1187	682	None
Kingfish (KIN 1*)	Unknown	Unknown	91	73	Insufficient data
Kahawai (KAH 1*) (*introduced into QMS 2004)*	Unknown	<20%		933	1995
Albacore (ALB 1)	Stable	60%	None available	832	2003
Trevally (TRE 1)	Uncertain	Uncertain	1506	1014	1984 Not available since QMS
Bluenose (BNS 1)	Unknown	Unknown	1050	1023	No biomass estimate available
Hapuka (HPB 1)	Uncertain	Unknown	481	442	None

Over the last twenty years, populations of orange roughy, oreos, snapper and rock lobster have been severely overfished. Some populations have been reduced to just 3% of their total population size (or total virgin (unfished) biomass).

Currently there is no recreational fishing catch and effort information for the Area until the Groups user survey and NIWA north island survey is complete.

There are no local incentives for recreational fishers to become involved in sustainably managing their fisheries resources for future generations.

Proposed Solutions

Desired Outcome: *Local fisheries sustainably managed and protected by the local community. Commercial fishing by local boats.*	
Goal	**Action**
Promote sustainable use and protection of fisheries habitat and marine ecosystems	Identify and establish a *mataitai* in Doubtless Bay and Karikari Peninsular where: • Bylaws are established to control effort of commercial fishing. • Bylaws include a 'no-take' calendar.
Protect customary fishing grounds from overfishing, habitat degradation and pollution	
To increase recreationally important fish species to levels that will reduce impact on fishing mortality on their population	Develop a voluntary code of practice for recreational fishing where: A spawning closure will be a major part.

Code of Fishing Practice

Below is a suggested code of fishing practice that the Group has developed over the past 3 years from Group meetings and interviews with fishers and fishing clubs in the Area. Developing a local code of fishing practice is an incentive for local fishers to become involved in sustainably managing the fisheries resource they use. It will involve being guardians or kaitaiki of the code through monitoring its uptake within the community and raising awareness of the code. The code is about expressing kaitaikitanga.

Suggested Code of Fishing Practice:

- Spawning closure between November to March (2x4 week periods) where no fishing can occur using all fishing methods.
- No set netting and gill netting at all times in the Area (except for Flounder & Mullet) and ban the use of other destructive fishing methods (eg. dredging).
- Only use hooks specifically designed to minimise gut hooking
- No more permits to be granted to commercial fishers for the Mangonui Habour and Doubtless Bay.
- Competitions – none inside Mangonui, Taipa and Aurere estuaries.
- Compliance – achieved by local fishers (customary, recreational, commercial) where visitors are made aware of Code and to respect this Code.
- The minimum size of Snapper to be 30cm
- Fishers to be encouraged to keep a Catch Diary.
- Restrict commercial fishing to every second year

Mataitai

Figure 21 is a suggested area for a *mataitai*, a *Fisheries Act 1996* customary fishing tool.

For more details about mataitai reserves see Appendix 3; and Appendix 4 on the type of decision-making criteria used to site the mataitai reserve.

Mataitai Reserves

Fisheries Act tool to protect traditional fishing grounds and significant areas special to tangata whenua. Bylaws/restrictions may be put in place to control level of taking fish, aquatic life or seaweed in the area. A maori committee or kaitiaki can be empowered to make bylaws over the area, if they consider it necessary for sustainable management. Both Maori and non-maori may fish in Mataitai reserves. Commercial fishing may not occur in Mataitai reserves unless the committee recommend to the Minster of Fisheries that it is allowed.

HAVE YOUR SAY

Please read the background information. The Group welcomes your comments on issues raised in this Discussion Document and proposed actions. What are your thoughts about a community based voluntary code of fishing practice? What do think about mataitai reserves?

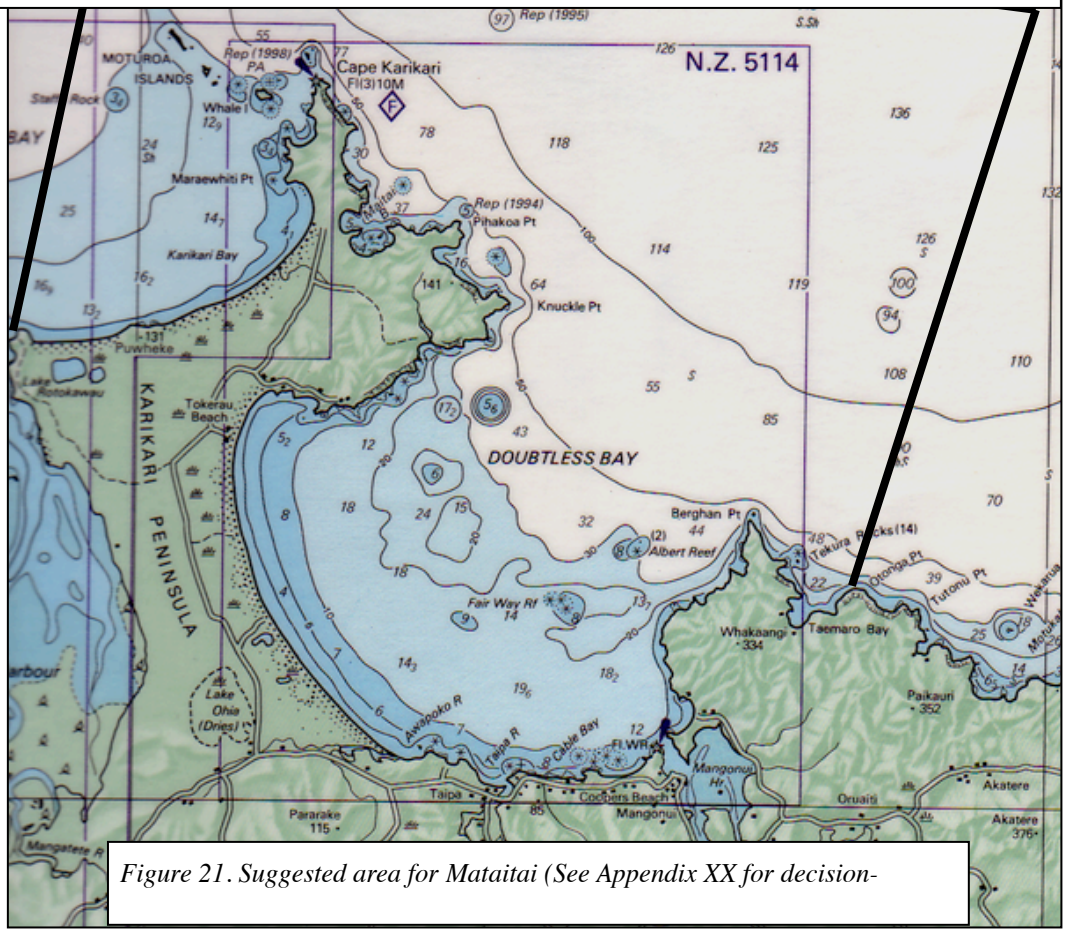


Figure 21. Suggested area for Mataitai (See Appendix XX for decision-

LOSS OF BIODIVERSITY & HABITAT DEGRADATION

About the Issue

Biodiversity is the diversity of non-human life on earth.

Biodiversity on earth, including NZ[23], is declining.

It is a worldwide trend, due to the destruction of habitat, harvest by humans and introduction of exotic pests, diseases and plants. In the space of 3 centuries our planet will have gone from a peak of species richness to a trough of poverty (Western 1992).

Biological diversity (biodiversity) refers to the number and variety of living organisms.

It includes diversity of species, between species, and of ecosystems and the processes that maintain them.

It also refers to genetic diversity, which is about the varied genetic make-up among individuals of a single species.

Restoring biodiversity and protecting natural heritage is a key value for the Group and so has been identified as a ***key***

[23] NZ is a signatory to the Convention of Biological diversity, making a c
indigenous biodiversity. See NZ Biodiversity Strategy (2000) for key act

Human activities within our marine environment, including catchments, has placed pressure on plants, animals and even natural processes (eg. sea temperature increasing), such that some species no longer exist and others are seriously threatened in their ability to survive.

Most of New Zealand's biodiversity is in the sea – most of the world's biodiversity is in the sea. There is more marine biodiversity and greater diversity than on land (Groves 2003).

The Group has identified that diversity of habitats (eg. rocky reefs, deepwater reefs, sandflats, mudflats) and features (eg. sand dunes, estuaries) and the presence of rare and endangered species (eg. orca, whales, black coral) are values of the Area's marine environment.

State of the Areas Biodiversity

No comprehensive study of the Areas biodiversity has been undertaken, so enormous gaps exist in our knowledge of life under the surf and waves. But we have only just begun gathering information through a habitat survey and mapping study (Dr. R. Grace, pers. comm. 2005). Identifying the variety of habitats, which are surrogates of biodiversity, will provide some idea of ecosystem and species biodiversity.

Loss of biodiversity is in decline in the Area. An example of this can be seen from the extensive number of kina barrens, which was once believed to be a normal feature of northeastern New Zealand. However, scientific research in no-take marine reserves has found that kina barrens are being replaced by kelp forest. This is a result of the phenomenon described as trophic cascade effect, where higher trophic level predators are returning to the food web and having an indirect effect on plant community structure (Shears & Babcock 2003).

"Without a marine reserve you'll have a barren mataitai and/or taipure – you need a breeding area" – Hone Tanumanu, Whangara, Ngati Konohi (Te

For Karikari Peninsula, Shears and Babcock (2004) seaweed research found that Karikari Peninsula had the highest species richness with 47 species. This was higher than the offshore islands of the Poor Knights, Mokohinau and Tuhua off Tauranga.

Doubtless Bay marine habitats have also been degraded over the years with increasing trawling and dredging effort, inappropriate land use activities sending tonnes of sediment, ammonia, nitrogen and phosphorous into the Mangonui and Taipa estuaries. Lush scallop, cockle and tuatua beds have disappeared with only a small number of remnants remaining.

In New Zealand we know of 8000 marine and coastal species. In 2000, we knew of 61 seabirds, 41 marine mammals, 964 fish (108 are endemic – found nowhere

else on the earth), 2000 molluscs (snails, shellfish and squid), 350 sponges, 400 echinoderms, 900 seaweed species and 700 micro-algae species.

World Wildlife Fund (WWF) New Zealand recently produced a report (Arnold 2004) outlining hotspots of marine biodiversity for cetaceans, seals and birds; fish; and benthic invertebrates, algae and plants. Doubtless Bay, Karikari Peninsula and offshore areas are part of biodiversity hotspots for fish, benthic invertebrates, algae and plants (Arnold 2004).

Biodiversity is everyone's business

Without biodiversity you would not have the variety of food you eat, the variety of seabirds you see, and the variety of fish and shellfish you see at the beach. It is in all our backyards. Biodiversity is the basis of all our food and resources and many economic activities. In 2002, 84 countries imported seafood products from NZ to the value of $1.51 billion.

A 1997 economic study suggested that the total annual value provided by New Zealand's indigenous biodiversity could be more than twice that of New Zealand's GDP (gross domestic product) (NZBS 2000).

We have a responsibility to maintain the existence of our sea and the species that reside there.

Proposed Solutions

Desired Outcome: *Marine life and their habitats are prolific and secure in their natural state for the enjoyment of future generations (mokopuna).*	
Goal	**Action**
To identify and protect areas of marine life and their habitats	Identify and establish an effective no-take (*tapu*) system where: • The system will support the mataitai • The system will contain special, unique and representative habitats • Natural ecological processes are protected • Ensure that the system provides for local community management • The size of the individual marine reserves are ecologically self-sustaining, may have an impact on local fisheries, preserves genetic diversity, connectivity of sites. • Sites are permanent with a generational review with the possibility of some site becoming a rahui • Use the best possible available information for decision-making, which is not only scientific but local anecdotal evidence. • Ensure economic and educational opportunities will exist with the local community (eg. easy access from shoreline).

Suggested areas for no-take zones

Figure 22 shows suggested areas for no-take (tapu) areas where no fishing will be allowed. The criteria used to design the location of the no-take areas are in Appendix 5. The best possible information was used to design these no-take areas including habitat mapping, biodiversity modelling, fishing effort, response modelling, and design criteria. Appendix 6 outlines the extensive process involved under the *Marine Reserves Act* to create a marine reserve.

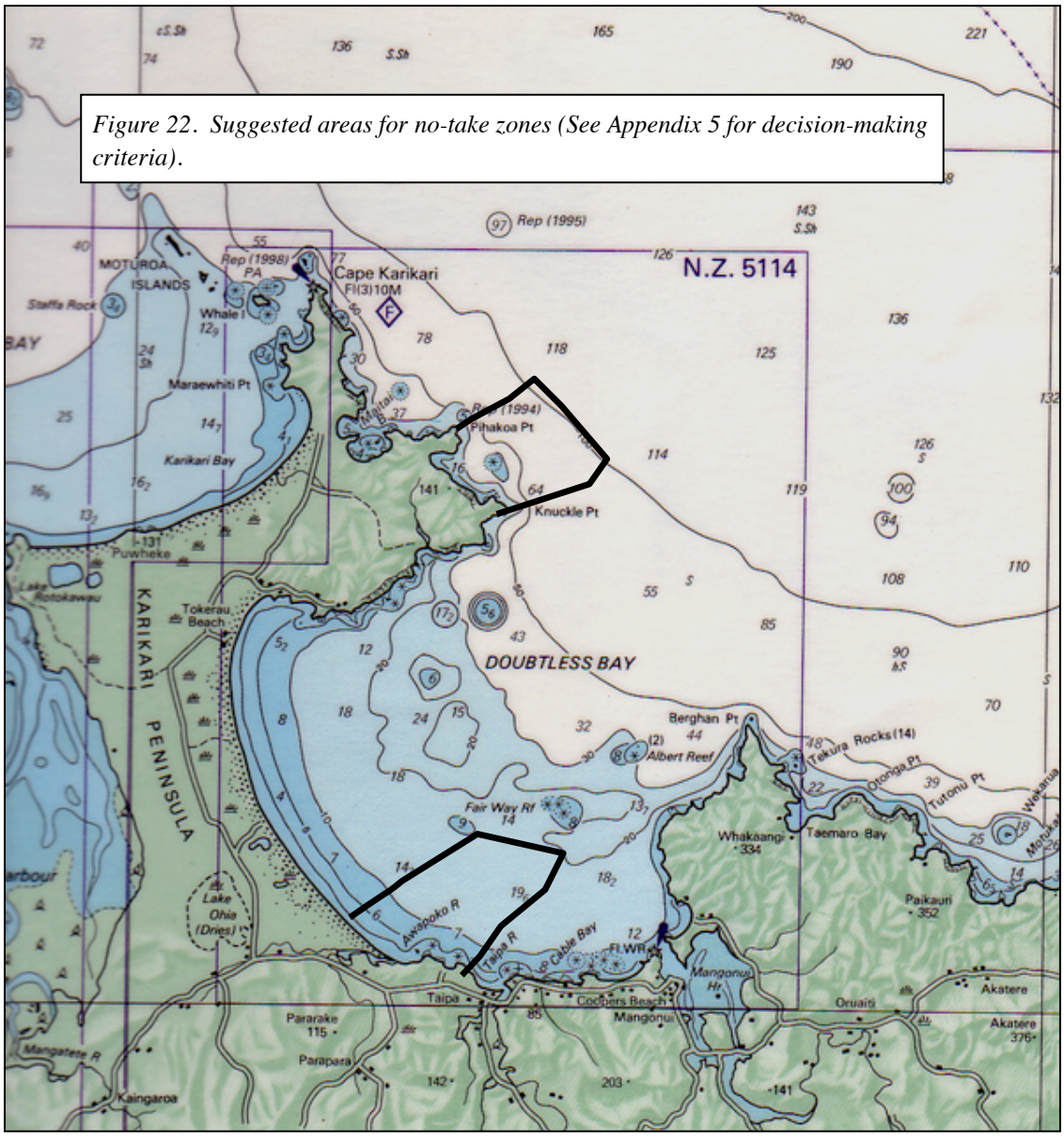


Figure 22. Suggested areas for no-take zones (See Appendix 5 for decision-making criteria).

HAVE YOUR SAY

Please read the background information and criteria used to design these no-take (tapu) areas. The Group welcomes your comments on issues raised in this Discussion Document or any of the proposed actions.

DECLINING WATER QUALITY

About the Issue

60-80% of marine pollution comes from land, losses through sedimentation, plastics, and unsuitable land use. A phenomenal 390-million tonnes of sediment are washed from the New Zealand mainland into the sea each year (NZBS 2000). The Government recently reported that 95% of New Zealand's lowland rivers and waterways are not safe for swimming in or drinking from.

New Zealand's inshore marine areas, particularly estuaries and sheltered bays, are immensely rich and biologically diverse environments. The effect of all this sediment and nutrients when washed off the land can deplete oxygen, create harmful algal blooms and reduce the abundance and diversity of marine life.

Many locals have all witnessed first hand the dramatic decline of water quality in Mangonui, Taipa and Aurere/Awapoko estuaries. Also from local observations and anecdotal evidence, flood plumes (freshwater plumes originating from estuary mouth) from the estuaries have seen to occur as widespread as Perhipe Beach, Whatuwhiwhi.

State of the Areas Water Quality

Clean water is essential for ALL forms of life. The Northland State of the Environment (SOE) 2002 report stated that combined Taipa-Mangonui estuaries were unsafe to swim in and collect shellfish during winter (Figure 23).

The water quality of the Areas estuaries area degraded compared to less degraded estuaries such as Rangaunu and Parengarenga. Human modifications to the land are having an impact

Regional Coastal Plans

Regional coastal plans are plans prepared by regional councils for the coastal marine area of a region. Their purpose is to assist the regional councils in achieving the sustainable management of their coastal environment. The plans outline the policies and rules that govern what activities the councils will allow, control or prohibit in the coastal environment. To ensure consistency and integration of the management of the coastal environment throughout New Zealand, the Regional coastal plans must not "be inconsistent" with the New Zealand Coastal Policy Statement.

Coastal Plans are a requirement under the

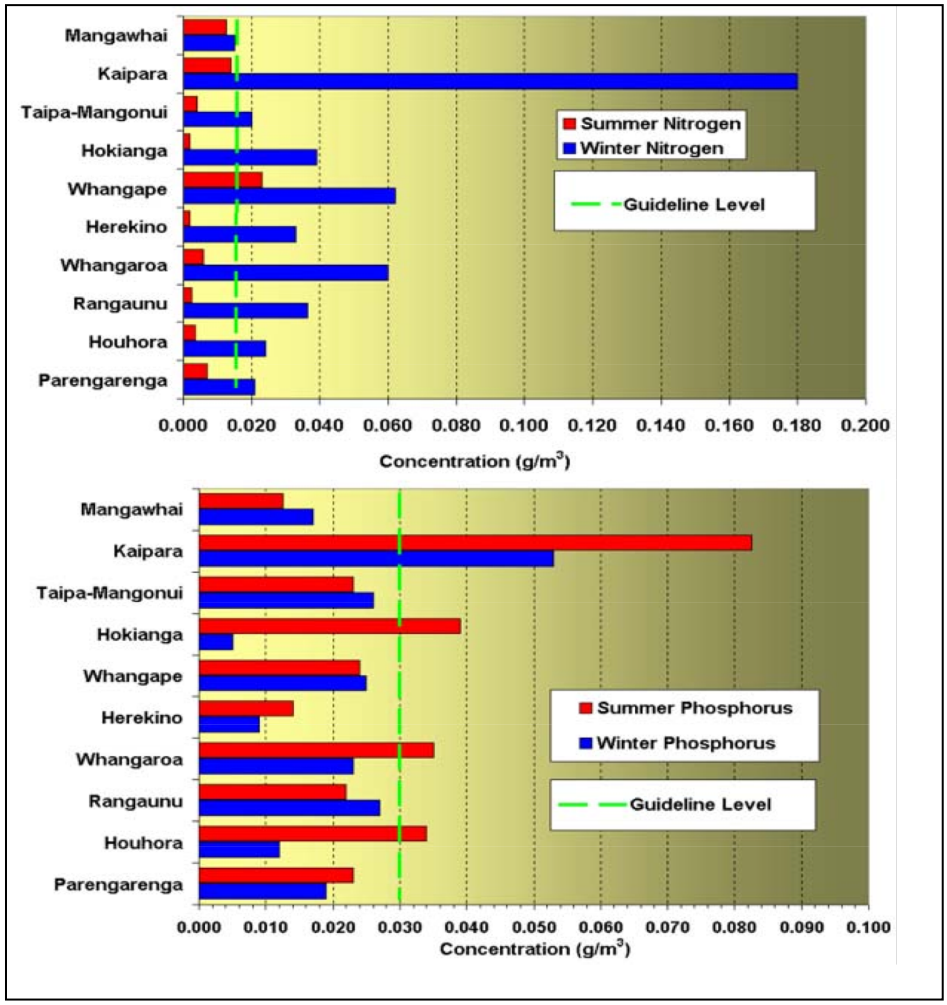
on water quality of harbours and water quality is reduced to a poor level following heavy rainfall (Northland Coastal Policy 2004).

Water quality information from Taipa and Mangonui estuaries has been collected for 1998 and 2004. Water quality is not monitored every year. Information received from the NRC on these sampling occasions found:

- Dissolved oxygen (DO) to be satisfactory (6-7 g/m^3) during summer and winter. This is a broad indicator of water quality health. It is one of the first parameters to monitor. Most of the measurements were taken during the day and DO can vary during the day and night because of photosynthesis and respiration occur by organic matter.
- Faecal coliforms and enterococci bacteria from animal and sewage varied between summer and winter, with 10-40 times more bacteria in winter than summer. Not safe to swim or collect shellfish during winter.
- Nitrogen, Phosphorous, Ammonia & Chl-a (Chlorophyll a) all play important role in primary production of coastal ecosystems. Ammonia can be toxic to aquatic life. Measuring these parameters provide an idea about impact of adjacent landuse. Guidelines used are ANZECC 2000 Water Quality Guidelines. For NO_3-N is 0.015 g/m^3 (estuaries) and 0.005g/m^3 (coast). For Total P is 0.03 g/m^3 (estuaries) and 0.025 g/m^3 (coast). Nitrogen was higher in winter and low in summer. In winter TN (Total N) exceeds ANZECC guidelines. Such high levels can cause problems including algae growth and blooms. Is high probably because of increased runoff from catchment during winter rainfalls, which is carrying nutrients (N & P) in soil. Total Phosphorous again is higher in winter and low in summer. For 2004 sampling, TP did exceed ANZECC guideline levels. Chl-a information was inconclusive and insufficient information to provide any comment.

Figure 23. Summer and winter nitrogen and phosphorous levels for combined Taipa and Mangonui estuaries, 1998, exceed the guideline level for nitrogen that cause problems in algal growth (Source. Northland SOE

Ammonia again was inconclusive and insuffient data to provide any comment.



Proposed Solutions

Desired Outcome: *Healthy, clean catchment waterways from land to sea.*	
Goal	**Action**

To implement a community-based Doubtless Bay integrated catchment management plan and activities	• Develop a catchment-based management plan where:
	  ○ Define common objectives for environmentally appropriate use of catchment resources. Develop plans and strategies to achieve them. This will include indicators of suitable water quality parameters to re-establish ecological integrity in the estuaries, zero pollution policy, zero remanent forest land clearing policy and better riparian management.
	  ○ Zero clearing of vegetation where it is fundamental for the stability of land.
	  ○ Immediate measures put in place to control erosion and subsequent sedimentation of creeks and streams.
	  ○ Indigenous coastal vegetation is protected (eg. mangroves)
	  ○ Build partnerships with tangata whenua, industry, landowners and regional and local councils to develop plan.
	• Seek funding for riparian vegetation planting and creek/stream fencing in Mangonui and Taipa catchments.
	• Support local landcare groups taking action in their catchments particularly with: measuring and monitoring water quality in all streams feeding into Doubtless Bay and; riparian planting and fencing.
	• Establish a local network of volunteers.

Ensure that regional councils and other government organisations are proper 'watch-dogs' of our waterways	Apply pressure to these organisations to carry out their mandate of protecting waterways.

HAVE YOUR SAY

Please read the information provided about water quality and upstream use. Do you
is a problem? What is the condition of your local stream, waterway or estuary? Wh
changes have you seen? Are weeds and other exotic plants a problem along your wa

LOCAL MANAGEMENT & KAITIAKITANGA

About the Issue

Locals managing local resources. This is expressing kaitiakitanga and guardianship. This has been a major ambition for the Doubtless Bay Marine Protection Group. Members have been concerned that there is virtually no local management or control of their marine environment. They are committed to working in partnership with tangata whenua who have mana moana (jurisdiction over the sea).

Kaitiakitanga – *its about the comprehensive spiritual and environmental code which governs tangata whenua use of NZ's biological resources. This ancestral code is directly concerned with the care and protection of mauri, which according to the traditions of tangata whenua, is the dynamic life principle that underpins all biodiversity.* *(Adapted from Matiu & Mutu 2003 and Te Papa Atawhai Kaupapa Maori Strategic Policy, 2001)*

There is a range of tools to manage the marine environment, both legal (eg. Fisheries Act, Marine Reserves Act) and non-legal means (eg. voluntary code of practices; community farming guidelines; rahui; tapu). The Group believes that to sufficiently address all the issues discussed in this Discussion Document, a range of these tools must be used.

State of local management and kaitiakitanga in the Area

Currently, the Ministry of Fisheries and quota holders manage fisheries resources; Northland Regional Council manage the coastal development and the District Council, Department of Conservation and Ministry for the Environment manage anything in between.

There is no co-ordinated local management or co-management situations in the Area. The Group with local hapu of Mangonui harbour worked together to implement a *rahui* for Mangonui harbour on all set netting. There are individual kaitiaki from the Area doing their bit for the environment. But local management is not about individuals. It is about a community working together to manage, monitor and measure the marine environment.

Proposed Solutions

Desired Outcome: *We are all proper guardians of places, natural resources and other taonga.*	
Goal	**Action**
Promote the active exercise of kaitiaki and guardianship of our local marine environment. Co-management between tangata whenua and the wider community of local resources and habitats.	• Support local hapu with establishing management partnerships and seeking ownership of seabed and foreshore, customary fishing grounds and other taonga. • Prepare a policy on kaitiakitanga in order to begin the spiritual and environmental journey. • Plant trees • Education

HAVE YOUR SAY

Please read the information provided on cultural significance and NZ management tools. How would you implement kaitiakitanga? Do you think "locals managing local resources" is a good idea?

TYPES OF MARINE MANAGEMENT TOOLS AVALIABLE IN NZ UNDER LEGAL MEANS.

The Parliamentary Commissioner for the Environment (PCE) completed a review of New Zealand's marine management in 1999. Its findings have lead to the development of an Oceans Policy for the sustainable management of New Zealand's marine environment. The PCE believes that there are fundamental changes needed to manage the sea and to value its resources, and to integrate a 'property rights' system with a 'public good' management system. Currently, fisheries management, protection initiatives in regional coastal plans and marine reserves have no links between them and therefore no provision and assessment of the best overall benefit for New Zealand's seas and New Zealanders.

Kaitiakitanga – *it's about the comprehensive spiritual and environmental code that governs tangata whenua use of New Zealand's biological resources. This ancestral code is directly concerned with the care and protection of mauri, which according to the traditions of tangata whenua, is the dynamic life principle that underpins all biodiversity.* *(Adapted from Matiu & Mutu 2003 and Te Papa Atawhai Kaupapa Maori Strategic Policy, 2001)*

There is a range of marine management tools available in New Zealand under legal means. Table 11, 12 and 13 is an analysis of the range of tools. The tools have been assessed on the basis of providing protection. You can see that the tools vary from providing total and comprehensive protection to enabling the widest range of uses. Each has its strengths and weaknesses and each has different objectives. The Group wishes to see a combination of all these tools and non-legal means such as rahui and tapu to address the 5 key issues, as using only one tool will not achieve our vision.

Community-based management

Community "care" groups and community initiated management of land and sea resources are not new to New Zealand. Fisheries management was tribal based and hapu based before European settlement. Essentially control of access to fishing was by tribes and hapu. This is a old system, stable, has had sustainable fisheries for centuries and is very common form of management in subsistence countries (Pinkerton & Weinstein 1995).

Examples of community-based marine management. The Guardians of Fiordland Fisheries[24] came together because they believed something had to be done today about protecting the natural features of

Community-based management

Community-based management is the underlying objective of the Doubtless Bay Marine Protection Group.

Empowering the community to manage their local marine environment in a way that will benefit future generations.

Restoring the management and control back to local communities is a key issue for the Group and so has proposed particular actions to address

[24] Guardians of Fiordlands Fisheries & Marine Environment Inc. 2003. Fiordland Marine Conservation Strategy: Te kaupapa Atawhai o Te Moana o Atawhenua. Principal Author: Laurel Teirney. 138 pages.

the fiords. The only way to achieve that was through a community driven management option and not wait for government driven management. The Guardians now have a marine management bill in parliament with bipartisan support, which will create 8 new marine reserves and 12 new non-commercial fishing zones.

Kaipara Harbour[25] community has also produced a management plan which proposes commercial fishing but only for locals under a specially created quota area. Whaingaroa/Raglan[26] community outlines in their harbour fisheries plan recommendations for a separate quota management system, restrictions in gill netting and marine protection mechanisms such as marine reserves, rahui and mataitai.

Countless coastal communities[27] around the world have also had the foresight, and have had the right, to remedy environmental damage and implement community-based management.

Why do community-based management systems tend to achieve sustainable use?

Achieving success in community-based management has been found to depend on the fishery, scale of the fishery and the type of community. Common features of success include:

- Highly dependent on the fishery
- Highly vulnerable to non-sustainable use
- Highly identified with their fishing place
- Unwilling or unable to transfer access rights out of their area
- Willing to use mechanism for equitable resource access or sharing and
- Stewardship (kaitaikitanga).

Not all of the above points are relevant to New Zealand communities today, however one of the most important helpful indicators of success is the spirit of stewardship. Stewardship within a community does not happen overnight.

Stewardship is the essence of community-based management, and this has been seen in the examples provided above. This is what the Doubtless Bay Protection Group wishes to achieve with the development of the Community Marine Management Plan.

Communities have a duty to manage marine resources in New Zealand for future generations, which has been a key guiding principle for developing the Discussion Document: Community Marine Management Plan.

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[25] Kaipara Harbour Sustainable Fisheries Management Study Group. 2003. Kaipara Harbour. Fishing for the Future. December 2003

[26] Whaingaroa Environment Centre. 2003. Draft Whaingaroa Harbour Fisheries Plan. February 2003.

[27] Pinkerton, E and M. Weinstein. 1995. Fisheries that Work. Sustainability through community-based management. A Report to The David Suzuki Foundation. July 1995. 199 pages.

Table 11: Full Protection Tools (ie. Full Protection Of Primarily Natural Areas Because Of Particular Features/ Habitat/ Biodiversity Characteristics; Limitation On Uses)

TOOL	OUTCOME FROM THE TOOL:								
	Particular Species & Component Of Biodiversity	**Biodiversity & Ecosystem Protection**	**Fisheries Benefits**		**Educational Opportunities**	**Research Opportunities**	**Local Economic Benefits**	**Local Management Opportunities (include. Bylaws, Mgmt Committee)**	**Pollution Prevention**
			Comm. Fishing	**Rec. Fishing**					
Marine Reserve No-Take Area		**X**	**X**	**X**	**X**	**X**	**X**	**X**	

Table 12: Partial Protection Tools (ie. Protection of particular species and components of biodiversity; usually provides for multiple use in the area).

TOOL	OUTCOME FROM THE TOOL:								
	Particular Species & Component Of Biodiversity	**Biodiversity & Ecosystem Protection**	**Fisheries Benefits**		**Educational Opportunities**	**Research Opportunities**	**Local Economic Benefits**	**Local Management Opportunities (include. Bylaws, Mgmt Committee)**	**Pollution Prevention**
			Comm. Fishing	**Rec. Fishing**					
Marine Fisheries Park (Eg. Mimiwhangata,)				**X**		**X**			
Marine Park (undcr own Act)	Eg. Hauraki Gulf Marine Park; Sugar Loaf MPA								

Marine Mammal Sanctuary	X				**X**	**X**	**X**		
Quota Management System			**X**	**X**		**X**			
Bags Limits – Recreational Fishing Limits				**X**					
Taiapure			**X**	**X**			**X**	**X**	
Mataitai				**X**				**X**	
Rahui or Tempoary Closure			**X**	**X**				**X**	

Table 13: Mixed Use Tool (ie. Managing resource use and non-extractive use)

TOOL	**OUTCOME FROM THE TOOL:**								
	Particular Species & Component Of Biodiversity	**Biodiversity & Ecosystem Protection**	**Fisheries Benefits**		**Educational Opportunities**	**Research Opportunities**	**Local Economic Benefits**	**Local Management Opportunities (Include. Bylaws, Mgmt Committee)**	**Pollution Prevention**
			Comm. Fishing	**Rec. Fishing**					
Regional Coastal Plan – Resource Maangement Act									**X**

THE NEXT STEPS – WHERE TO FROM HERE?

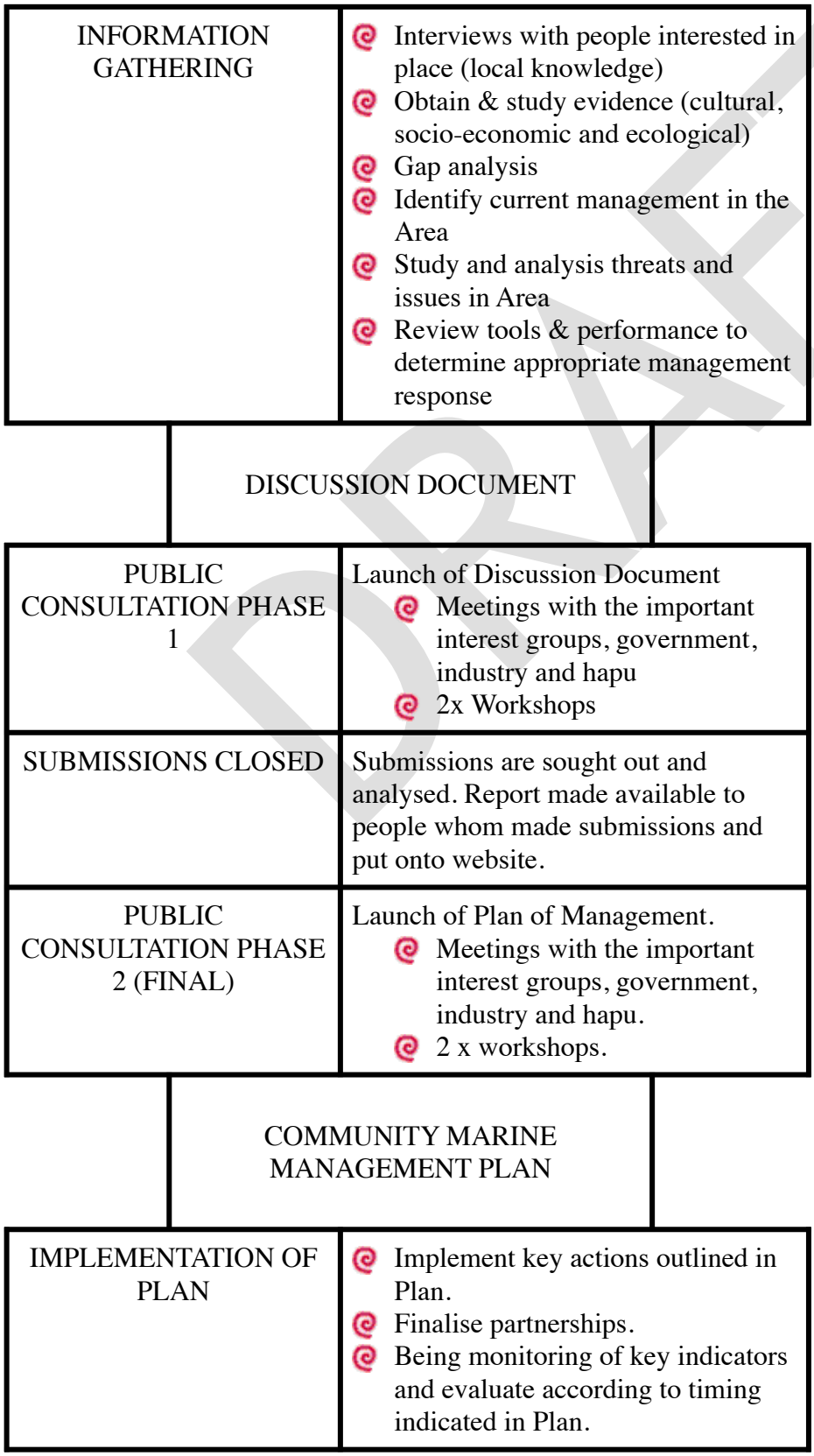
The questions many people have when reading documents like these are:

What will this Plan achieve?
How will it be implemented?

The Group has learnt a lot about the Area and has improved their knowledge of the ecosystem and issues in the Area, the region and even globally. This Discussion Document and consequently Community Marine Management Plan has one underlying achievement – *to empower the local community to manage their local marine environment in a way that will benefit future generations*. This Discussion Document purposes key actions to achieve this empowerment.

The Discussion Document is the initial stage (Figure 24) of our public consultation with the community and interested groups. The Group wishes for an open and utterly transparent process, where the most up to date and correct information has been provided to you, in order to attract your input and comments.

Figure 24. The process the Group is following to achieve their vision



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GLOSSARY

Biodiversity	*Biological diversity. Usually described as genetic diversity, species diversity and ecological diversity*
Bioregion	An area of land and/or water whose limits are defined by the geographical distribution of biophysical attributes and ecological systems.
Biomass	The living mass of an animal or plant population
Catchment	Catchments are defined by water flow. Rain landing on vegetation or the ground either percolates into the ground, evaporates, or flows via creeks and streams into rivers, lakes, estuaries, swamps, or coastal water bodies (Van Roon & Knight 2003).
ICM	*(Integrated Catchment Management) a management concept based on catchment components and ecological processes (climate, geology, soils, hydrology, groundwater, water quality, plant and animal communities, land use, social and economic systems, valued features and activities), and the needs of users.*
Ecological Diversity	*Variety of ecosystems in a region*
Ecoregion	*A geographically distinct assemblages of natural communities that share a large majority of their species, ecological dynamics, and environmental conditions* (Arnold 2004).
Ecosystem	*Biological system comprising a community of living organisms and its associated non-living environment*
Endemic	*Refer to uniqueness of a species to a defined area, such as NZ, or a more restricted area, like Chatham Islands*

Genetic Diversity	*Variation of genes within a species*
Habitat	*The place or type of site in which an organism (or group of organisms) naturally occurs.*
Hapu	*Sub-tribe or tribe, a group of whanau family)*
Hui	*Maori meeting. Protocols of which vary.*
Inshore	*The near coastal waters extending from coastline and estuaries out to seaward boundary of the continental shelf. Usually ocean floor habitat shallower than 200m.*
Iwi	*Tribe, a grouping of hapu*
Kaimoana	*Seafood*
Life cycle	*This means the developmental journey of an individual plant or animal has through its life*
Life History	*See Life Cycle*
Network of MPAs	*A system of individual MPAs meeting particular design criteria, which varies from country to country and plan to plan. An appropriate definition of a network system could be the recent development of the State of Victorias' marine protected areas system and the new zoning for the Great Barrier Reef World Heritage Area and Marine Park.*
Mataitai	*Fisheries Act tool to protect traditional fishing grounds and values. Bylaws/restrictions may be put in place to control level of taking fish, aquatic life or seaweed in the area. A maori committee or kaitiaki can be empowered to make bylaws over the area.*
Mana	*Pride, strength, reputation*
Mana moana	*Authority over identified marine areas through kaitaiki*
Mana whenua	*Customary rights and authority over land, customary authority exercised by an iwi or hapu in an identified area.*

Marine environment	*The oceans & atmosphere above; biological resources; mountains to territorial sea (12nm), EEZ (200nm) and continental shelf; islands, coastal zone, estuaries, sand dunes, beaches & cliffs, rocky reefs, soft sediments and deepwater.*
Marine Protected Area (MPA)	*Area of sea dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means. For example, a no-take area is commonly referred to as a MPA tool.*
Mauri	*Life principle, special character*
NZBS	*NZ Biodiversity Strategy. Fulfils NZ's commitments, under the international Convention on Biological Diversity (CBD)*
Protection	*Meaning varies with NZ legislation, but is defined here as:* *Conservation, enhancement and restoration of species, populations and ecosystems; of fauna and flora and processes that maintain their function and structure.*
QMS	*Quota Management System; used to manage NZ fisheries. A system based on ITQ (Individual Transfereable Quota) or property rights.*
Rangatira	*NgatiKahu kaumatua analyse: ranga is a shoal of fish; raranga is to weave or plait; tira is a group of people. A rangatira then is someone who holds a group of people together so that they move as one, like a shoal. (Matiu & Mutu 2003)*
Rangatiratanga	*Chieftainship including sovereignty, rights of self-determination, self-government, the authority and power of iwi or hapu to make decisions and to own and control resources (Matiu & Mutu 2003)*
Rahui	*A restriction on access, prohibition.*
Rohe	*Tribal region*
Species Diversity	*Variety of species within a region*

Species	*A group of organisms capable of breeding with each other but not with members of other species.*
Taiapure	*Area that is estuarine or littoral (low tide area) coastal waters, that have customarily been of special significance to any iwi or hapu either as a source of food or spiritual reasons. Recognition of rangatiratanga.*
Takiwa	*Territory of an iwi, hapu or whanau*
Tangata whenua	*People of a given place in relation to a particular area. Means the iwi or hapu that holds mana whenua over that area.*
Taonga	*Treasure, anything that is highly prized. It acquires a particular legal context when applied to the interpretation of the Treaty of Waitangi.*
Tikanga Maori	*Maori customary values and practices*
Whakapapa	*Geneology, ancestral connections*

INFORMATION GATHERED

Area	Subject	Literature	Copy	Raw Data
Far North, NZ	Fishing Maori customs	Muriwhenua Fishing Report, Waitangi Tribunal 1988.	Y	
Karikari Peninsula	Land Use	Dept. Lands & Survey. 1979. Karikari Peninsula. A land use study. Prepared by Department of Lands and Survey, June 1979. 133p.	Y (DOC Lib)	
Karikari Peninsular	Te Whanau moana customs & protocols	Matiu, M, and M Mutu. 2003. Te Whanau Moana. Nga kaupapa me nga tikanga. Customs and protocols. The teachings of McCully Matiu kaumatua rangatira of Te Whanau Moana and Ngati Kahu as told to Margaret Mutu. Published by Reed Books, Auckland, NZ. pp. 253.	Y	
Northland	Natural marine features & ecology	Morrison, M. 2005. An information review of eh natural marine feastures and ecology of Northland. Prepared for Department of Conservation. NIWA Client Report AKL2005-30, May 2005.	Y	
Far North, Karikari Peninsular	Habitats & fish assemblages	Anderson M J and R B Millar. 2004. Spatial variation and effects of habitat on temperate reef fish assemblages in northern NZ. *Journal Exp Mar Biol Ecol* 205:191-221.	Y	
Rangaunu Harbour	Coastal birds	Bellingham, M and A Davis. 1983. Rangaunu Harbour Wildlife Survey. NZ Wildlife Service, Dept of Internal Affairs, Wellington, 1983.	Y	
Karikari Peninsular	Fish biogeography	Brook, F J. Biogeography of near-shore reef fishes in northern NZ. J Royal Society of NZ. 32(2):243-274.	Y	Y (Vince)
Rangaunu, Doubtless Bay, Mangonui	Fisheries area restrictions	DOC. 2004. Area-based restrictions in the NZ marine environment. Department of Conservation, report prepared by Victoria Froude with maps by Roger Smith, December 2004.	Y	Y (Vince)
NZ	Fish biogeography	Francis, M P. 1996. Geographic distribution of marine reef fishes in the NZ region. NZ J Mar Freshw Res. 30:35-55.	Y	
North-east NZ	Fish	Francis, M P, Worthington, G J, P Saul, and K D Clements. 1999. New and rare tropical and subtropical fishes from northern New Zealand. NZ J Mar Freshw Res. 33:571-586	Y	
Houhoura, Rangaunu, Moturoa Islands, Cape Karikari, Mangonui, Whangaroa, Cavalli Islands	Coastal resources	Shaw, T and J Maingay. Coastal Resource inventory. First Order Survey. Northland Conservancy. Department of Conservation.	Y	

Karikari peninsular	Algae communities	Shears N T and R C Babcock. 2000. Classification and preliminary productivity estimates of rocky coastal community types: northeastern NZ. Report to the Department of Conservation, November 2000.	Y	Y (Vince)
Rangaunu Bay	Harbours habitat, fauna & flora	Rangaunu Harbour Study Working & Steering Committees Report for the Northland Harbour Board, 1984.	Y	
Rangaunu Bay	Important descriptive work	Anon, 1983: Rangaunu harbour study, Northland Harbour Board.		
Northland, Rangaunu Harbour	freshwater survey	Poynter, M. 1988: Rangaunu Harbour Catchment: Freshwater Fisheries Report. Northland Federation of Acclimatisation Society. Northern Region Technical Report Series No 5, May 1988.		Y (Vince)
Mangonui estuary & Moturoa Islands	Surface temperatures	Grace, R.V. 1977: Sea surface temperatures between Mangonui and the Moturoa Islands, northeastern New Zealand, in May 1976. *Tane23: 67-69.*	Y	
Moturoa Islands	Intertidal & sublittoral/ rocky shore	Grace, R V and G F Puch. 1977. Intertidal and sublittoral patterns of marine life of the Moturoa Islands, northeastern NZ. Tane 23:51-57.	Y	
Cavalli Islands	Macrobenthos	Grace, R.V.; Hayward, B.W. The macrobenthos of the Cavalli Islands, northern New Zealand. *Tane 26: 189*	Y	
Cavalli Islands	Fish	Nicholson, J. 1979: A checklist of fishes from the Cavalli Islands, Northland, NZ. *Tane 25*:133-139.	Y	
Northern NZ	Fish	Francis, M P, M A Morrison, J Leathwick, C Walsh, and C Middleton. In press. Predictive models of small fish presence and absence in northern NZ harbours. Accepted to Est, Coastal & Shel Sci.	Y	
Cape Karikari,	Fish populations	Willan, R.C., Dollimore, J.M., & Nicholson, J., 1979. A survey of fish populations at Karikari Peninsula, Northland, by SCUBA diving. *New Zealand Journal of Marine and Freshwater Research 13*:447-458.	Y	
Northeastern NZ	Reef fish	Jones, G P. 1988. Ecology of rocky reef fish of northeastern New Zealand: a review. NZ J Mar Freshw Res. 22:445-462	Y	
Northeastern NZ	Reef fish distribution	Kingsford, M J. 1989. Distribution patterns of planktivorous reef fish along the coast of northeastern NZ. Mar Ecol Prog Ser. 54:13-24.	Y	
Karikari Peninsula		Bay of Plenty Polytech kaimoana report – Karikari Pensinsula	N	
Karikari Peninsula		Grahme Morrell (DOC funded) – habitat report	N	
Northland	Planning	Northland Regional Council Coastal Plan	Y (CD)	
Parengarenga, houhora, Rangaunu, Mangonui, Taipa	Mangroves, salt marshes	Chapman, V J. 1978. Mangroves and salt marshes of the Parengarenga, Houhora, Rangaunu, Mangonui Harbours and Taipa River. Dept. of Lands and Survey, Auckland.	Y	

Northland	East Auckland current	Ward, C, and L I N Roberts. 1986. The East Auckland current: one explanation for the distribution patterns of the coastal and off shore fish faunas of northeastern NZ. *NZ Dept. Lands and Survey Information Series* 16:211-219.	Y	
NZ	Subtropical convergence zone	Garner, D M. 1959. The subtropical convergence in NZ surface waters. NZ J Geol. Geophys. 2:315-37.	Y	
Ornithological society, botanical society ecological society, hydrological society, limnological society,		Ornithological society – Doubtless Bay, A. Goodwin	Y	
Far North	Commercial scallop stocks	Martin Cryer & Derrick M. Parkinson (2004). Dredge survey and stock assessment for the Northland scallop fishery, 2003. Final Research Report for Ministry of Fisheries Research Project SCA2002/02 Objectives 1 & 2. 34 p. February 2004.	Y	Y (Leane)
Far North	Commercial scallop stocks	Martin Cryer & Derrick M. Parkinson (2002). Dredge survey of scallops in the Northland and Cormandel scallop fisheries, 2001. New Zealand Fisheries Assessment Report 2002/61. 24p.	Y	
Mangonui estuary	Fish & habitat	NIWA (M Morrison) 25 harbours survey data	Y	Y
Doubtless Bay, STAT AREA 2	Research Trawl fish data	NIWA/Mfish trawl research database data	Y	Y
Doubtless Bay	Beach Seine Research database	NIWA/Mfish beach seine research database information	Y	Y
Doubtless Bay, Mangonui, Karikari Pen Offshore to 200m	Trawl, set net, purse seine effort distribution	Commercial fishing data (Ministry of Fisheries)	Y	Y
Doubtless Bay, Mangonui, Karikari Pen	Recreational fishing survey	NIWA/Mfish results of 03/04 and 04/05 surveys (Bruce Hartill, NIWA Auckland)	Pers. comm..	
STAT Area 2	Comm. Fishing	Mfish data	Y	Y
Far North	Natural features & ecology	Mark Morrison report to DOC on review of natural features & ecology of Northland.	Y	Y (V. Kerr)

Mangonui & Taipa estuaries	Water quality	Water quality data from NRC monitoring	Y	Y
Mangonui & Taipa catchments	# RMA consents		N	N
Doubtless Bay, KP, Mangonui	Economy statistics	None found on regional marine use expenditure	N	
Rangaunu, KP, Doubtless, Whangaroa	Marine classification	NIWA marine environment classification study – 1km resolution (chunky); caulerpa, cookia; physical variable		Y (vince)
Rangaunu, KP, Doubtless, Whangaroa	Marine mammals	Sightings & distribution-abundance (NEED); local, DOC d/base, orca	N	Vince
Rangaunu, KP, Doubtless, Whangaroa	Large fish & sharks	Include marlin, swordfish, yellowfin tuna, mako sharks, kingfish, great white, bronze whaler, blue & school sharks, sunfish, manta rays (Big Game Fishing Council; Clinton Duffy (DOC); MFish working group reports)	Y	
Moturoa Is	Seabirds	Breeding areas – none done; pers. comm. A. Goodwin	Y	Y
KP, Doubtless,	Fishing Competition data	Competitions data for 2004/05	Not all	
Rangaunu, KP, Doubtless, Whangaroa	Biodiversity	WWF ecoregions report on NZ's biodiversity – marine mammals, algae, benthic invertebrates and fish.	Y	Y (V. Kerr)
Karikari Peninsula, Doubtless Bay	Population statistics	Statistics NZ 2001 Population Census (www2.stats.govt.nz)	Y	

AERIAL PHOTOS:	
Cape Karikari, Karikari Peninsula, Matai Bay	Y
Moturoa Islands	
Rangaunu Harbour	Yes, on Vince CD
Doubtless Bay	Y
Mangonui	Y, on CD (Leane)
Taipa	

Aurere Bch	
Tokerau Bch	
Bergans Pt	
Taemaro Bay	

HYDROGRAPHIC CHARTS:			
Doubtless Bay NZ 5114	chart	Hydrographic Office; Royal New Zealand, 1977: Chart NZ5114, Doubtless Bay, 1:40000.	CD/LM Harddrive
Rangaunu Bay NZ 5113	chart	Hydrographic Office; Royal New Zealand, 1983: Chart NZ5113, Rangaunu Bay, 1:25000.	Hard copy
Whangaroa harbour NZ 5114	Chart	Hydrographic Office; Royal New Zealand, 1983: Chart NZ5114, Rangaunu Bay, 1:25000.	Hard copy
Doubtless Bay	Fair Charts	Fair Charts	Electronic (Leane & Vince)

APPENDIX 1: LIST OF RECORDED FISH ON KARIKARI PENINSULA BY BROOK (2002).

Listing also subtropical and tropical fish species found on Karikari Peninsular.

*Subtropical

**Tropical

Dasyatidae (Stingrays)
Dasyatis brevicaudata (Short-tailed stingray)
Dasyatis thetidis (Long-tailed stringray)
Myliobatididae (Eagle Rays)
Myliobatis tenuicaudatus (Eagle ray) (Whai keo)
Muraenidae (Moray eels)
Enchelycore ramosa (Mosaoic moray)*
Gymnothorax nubilus (Grey moray)*
Gymnothorax prasinus (Yellow moray)
Gymnothorax prionodon (Mottled moray)
Congridae (Conger eels)
Conger verreauxi (Common conger eel) (Ngoiro)
Conger wilsoni (Northern conger eel)*
Moridae (Morid cods)
Lotella rhacinus (Rock cod)
Pseudophycis barabata (Southern bastard cod)
Hemiramphidae (Halfbeaks)
Hyporhamphus ihi (Piper, Garfish (Ihe))
Trachichthyidae (Roughies)
Optivus elongatus (Slender roughy (Puramorehu))
Berycidae (Alfonsinos)
Centroberyx affinis (Golden snapper (Koarea))
Zeidae (Dories)
Zeus faber (John dory (Kuparu))
Scorpaenidae (Scorpionfishes)
Helicolenus percoides (Sea perch)
Scorpaena cardinalis (Northern scorpionfish (Matuawhapuku)
Scorpaena papillosus (Dwarf scorpionfish)
Serranidae (Groupers)
Acanthisitius cinctus (Yellow-banded perch)*
Caesioperca lepidoptera (Butterfly perch (Oia))
Caprodon longimanus (Pink maomao (Matata))
Epinephelus damselii (Spotted black grouper)*
Hypoplectrodes huntii (Red-banded perch)
Hypoplectrodes sp. (Halfbanded perch)*
Trachypoma macracanthus (Toadstool grouper)
Maomao))*
Girellidae (Nibblers)
Girella cyanea (Bluefish (Korokoropaounamu))*
Girella tricuspidata (Parore)
Kyphosidae (Drummers)
Kyphosus bigibbus (Grey drummer)**
Kyphosus sydneyanus (Silver drummer)
Arripidae (Kahawai)
Arripis trutta (Kahawai)
Chironemidae (Kelpfishes)
Chironemus marmoratus (Hiwihiwi (Kelpfish))
Aplodactylidae (Marblefishes)

Pomacentridae (Damselfishes)
Chromis dispilus (Demoiselle)
Chromis fumea (Yellow demoiselle)**
Chromis hypsilepis (Single-spot demoiselle)*
Parma alboscapularis(Black Angelfish)*
Parma polyepis (Banded scalyfin)*
Callanthiidae (Goldies)
Callanthias australis (Northern splendid perch)
Carangidae (Jacks)
Decapterus koheru (Koheru (Koheru))
Pseudocaranx dentex (Trevally (Arara))
Seriola lalandi (Kingfish (Haku))
Trachurus novaezelandiae (Jack mackerel (Yellowtail, Hauture))
Sparidae (Breams & porgies)
Pagrus auratus (Snapper (Tamure))
Mullidae (Goatfishes)
Upeneichthys lineatus (Goatfish, Red mullet (Ahuruhuru))
Pempheridae (Bullseyes)
Pempheris adspersus (Bigeye)
Chaetodontidae (Butterflyfishes)
Amphichaetodon howensis (Lord Howe coralfish)*
Pentacerotidae (Boarfishes)
Evistias acutirostris (Striped boarfish)*
Microcanthidae (Mados)
Athypichthys latus (Mado)*
Scorpidae (Stonebreams)
Labracoglossa nitida(Blue knifefish)*
Scorpis lineolatus (Sweep (Hui))
Scorpis violaceus (Blue maomao (
Labridae (Wrasses)
Anampses elegans (Elegant wrasse)*
Bodianus unimaculatus(Red pigfish (Pakurakura))*
Coris picta(Combfish)*
Coris sandageri (Sandager's wrasse)
Notolabrus celidotus (Spotty (Paketi, Pakirikiri))
Notolabrus fucicola (Banded wrasse (Tangahangaha))
Notolabrus inscriptus (Green wrasse)*
Pseudolabrus luculentus (Orange wrasse)*
Pseudolabrus miles (Scarlet wrasse (Puwaiwhakarua)
Suezichthys arquatus (Rainbowfish)*
Suezichthys aylingi (Crimson cleanerfish)
Odacidae (Butterfishes)
Odax pullus (Butterfish (Greenbone, Marari, Koeaea)
Pinguipedidae (Weevers)
Parapercis colias(Blue cod (Pakirikiri, Rawaru))
Tripterygiidae (Triplefins)
Forsterygion flavonigrum (Yellow-black triplefin)
Fosterygion lapillum (Common triplefin)
Fosterygion malcolmi (Banded triplefin (Mottled triplefin))
Karalepis stewarti (Scaly-headed triplefin)

APPENDIX 2 – RESEARCH OUTLINING IMPACTS OF MARINE RESERVES

New Zealand Experience:

Reserve name and location	Years of protection	Habitat type	Effects reported	Reference
Cape Rodney-Okakari Point Marine Reserve, NZ	27	warm temperate rocky reef	• Snapper 6 times more common in the reserve than outside. • Lobster 1.6 times more abundant, with a carapace 16mm bigger • Sea urchins densities declined from 4.9 per m^2 to 1.4 per m^2 .	*Babcock et al (1999). Changes in community structure in temperate marine reserves. MEPS (in press)*
Tawharanui Marine Park, NZ	14	Temperate rocky reef	• Snapper 9 times more common in the reserve than outside • Lobster 3.7 times more abundant, with a carapace 16mm bigger	*Babcock et al (1999). Changes in community structure in temperate marine reserves. MEPS (in press)*
Long Island – Kokomohua marine reserve, NZ	10	Cold temperate rocky reef	• Blue cod larger inside reserve than outside	*Davidson (2001). Changes in population parameters and behaviour of blue cod in Long Island – Kokomohua marine reserves, Malborough Sounds, NZ. Aquatic Conservation, Mar. FW. Ecosystems, 11:417-435*

Cape Rodney-Okakari Point Marine Reserve, NZ	27	warm temperate rocky reef	• Rock Lobster (jasus edwardsii) 3 to 50 times more abundant within reserve • Large individuals predominant inside reserve; biomass up to 10 times greater inside reserve	*MacDiarmid & Breen (1993). Spiny lobster popululation change in a marine reserve. In: Battershill et all (eds). Proceedings of the Second International Temperate Reefs Symposium, 47-56. NIWA Marine, Wellington.*
Cape Rodney-Okakari Point, Tawharanui, Te Whanganui-a-Hei, Tuhua marine reserves	27, 14, 10	Temperate rocky reef	• Abundance 3.9% increase in shallow (<10m) sites and 9.5% increase in deep (>10m) per year of protection • Mean size increased by 1.14mm per year of protection in reserves; mean biomass increased by 5.4% per year of protection • Egg production increased by 4.8 and 9.1% per year of protection for shallow and deep sites respectively	*Kelly, Scott, MacDiarmid & Babcock. (2000). Spiny lobster, Jasus edwardsii, recovery in NZ marine reserves. Biol. Cons. 92:359-69.*
Cape Rodney-Okakari Point Marine Reserve, NZ	27	Temperate rocky reef	• Sea urchins 20% more abundant inside reserve than outside; striking increase in abundance of rock lobster within reserve • Mean size snapper & rock lobster greater in reserve than outside	*Cole, Ayling & Creese. (1990). Effects of marine reserve protection at Goat Island, northern NZ. NZ J. Mar. FW. Res. 24:197-210.*

Cape Rodney-Okakari Point Marine Reserve, NZ **Spillover research**	27	Warm temperate rocky reef	• Spillover of rock lobster Jasus edwardsii; tagged lobster made extended excursions to offshore sandflats outside reserve	*Kelly, Scott, & MacDiarmid (2002). The value of spillover fishery for spiny lobsters around a marine reserve in northern NZ. Coastal Management, 30:153-66.* *Kelly (1999). Marine reserves & the spiny lobster, Jasus edwardsii. Unpublished PhD thesis, University of Auckland,. Auckland.*
Te Whanganui-a-hei marine reserve, NZ **Socio-economic research**	10	Warm temperate rocky reef	• Socio-economic research: cash injected into local economy by visitors to reserve supplemented livelihood of local businesses	*Cocklin & Flood (1992). The socio-economic implications of establishing marine reserves. Report to Department of Conservation. Department of Geography, University of Auckland, Auckland, NZ.*
Cape Rodney-Okakari Point marine reserve, Te Whanganui-a-hei marine reserve, Tawharanui marine park, NZ		Temperate rocky reef	• Snapper 14 times denser in reserve than outside • Snapper egg production 18 times higher inside reserve than outside. • Snapper size larger inside than outside reserve	*Willis, Millar & Babcock (in press). Protection of exploited fishes in temperate regions: high density & biomass of snapper (Pagrus auratus (sparidae) in northern NZ marine reserves.*

Cape Rodney-Okakari Point marine reserve, NZ	27	Temperate rocky reef	• Red Moki abundance higher inside reserve than outside	*McCormick & Choat (1987). Estimating total abundance of large temperate-reef fish using visual strip transects. Marine Biology 96:469-78.*
Poor Knights marine reserve, NZ	22	Subtropical rocky reef	• Snapper, tarakihi and pink maomao increased in estimated density by 302%, 101% and 129% respectively after 1 year of protection. • Snapper significantly larger inside than outside reserve	*Willis & Denny. (2000). Effects of the Poor Knights Islands marine reserve on demersal fish populations. Report to the Department of Conservation, Science & Research Grant No. 2519. Leigh Marine Laboratory, University of Auckland, NZ.*
Piopiotahi (Milford Sound) marine reserve, NZ	9	Fiord	• Rock lobster, Jasus edwardsii, more abundant inside reserve than outside	*Munn (2000). Rock lobster monitoring in Piopiotahi marine reserve. Internal report, Southland Conservancy, Department of Conservation, NZ.*

Te Awaatu (The Gut) marine reserve, NZ	9	Fiord	• Rock lobster, Jasus edwardsii, no difference in abundance • Mean size of rock lobster significantly greater than in control sites outside reserve	*Kelly (1999). Lobster survey of Te Awaatu (The Gut) marine reserve, Doubtful Sound. Unpublished report to Department of Conservation. Coastal & Aquatic Systems Ltd, Clevedon, NZ.*
Te Awaatu (The Gut) marine reserve, NZ	9	Fiord	• 6 times more rock lobster inside the reserve than outside • larger rock lobsters inside than outside	*Department of Conservation (2000). Lobster survey of Te Awaatu (The Gut) marine reserve, Doubtful Sound. Internal report, Southland Conservancy, Department of Conservation, NZ.*
Piopiotahi (Milford Sound) marine reserve, NZ	9	Fiord	• 7 times more rock lobster inside the reserve than outside • average size of lobster was bigger inside than outside the reserve	*Department of Conservation (2002). Lobster survey. Piopiotahi marine reserve, Milford Sound. Southland Conservancy, Department of Conservation, NZ.*
Te Tapuwae o Rongokako marine reserve, NZ	3	Temperate rocky reef	• 50% more rock lobster inside than outside reserve • rock lobster densities has shown no change since reserve establishment • reef fish abundance has shown no change since 2000.	*Department of Conservation (in press). Te Tapuwae o Rongokako marine reserve monitoring survey. East Coast – Hawkes Bay Conservancy, Department of Conservation, NZ.*

Te Tapuwae o Rongokako marine reserve, NZ	3	Temperate rocky reef	• intertidal paua were significantly more abundant and larger within the reserve than outside • No changes in kina population abundance	*Freeman (2001). Te Tapuwae o Rongokako marine reserve. Intertidal paua and kina survey 2001. East Coast Hawke's Bay Conservancy, Department of Conservation*
Te Angiangi marine reserve, NZ	5	Temperate rocky reef	• Rock lobster more abundant inside than outside reserve • Rock lobster 10mm larger inside than outside reserve	*Department of Conservation (in press). Te Angiangi marine reserve monitoring survey. East Coast – Hawkes Bay Conservancy, Department of Conservation, NZ.*
Te Angiangi marine reserve, NZ	5	Temperate rocky reef	• Intertidal paua are significantly larger within the reserve than at control sites outside • No significant changes in intertidal kina and paua density, but changes in density have been detected	*Freeman (2001). Te Angiangi marine reserve. Intertidal paua and kina survey 2001. East Coast Hawke's Bay Conservancy, Department of Conservation*

International Experience:

This table adapted from Roberts, CM and JP Hawkins (2000) Fully-protected marine reserves: a guide

Reserve name and location	Years of protection	Habitat type	Effects reported
Mayotte Island, Indian Ocean	3	Coral reef	• Total species richness did not differ, however most carnivores were more diverse and abundant in the reserve • Mean biomass of commercial species 202g per m^2 compared to 79g per m^2 outside reserve.
Looe Key, Florida, USA	2	coral reef	• Snapper increased by 93% • Grunts increased by 439%

Cousin Island, Seychelles	15+	coral reef	• Groupers, emperors and snappers were more abundant and diverse within the reserve.
Merritt Island National Wildlife Refuge, Florida, USA	28	sub-tropical estuary	• Experimental catch per unit effort was 2.6 times greater in the reserve for all game fish combined. • Spotted sea trout 2.4 times greater • Red drum 6.3 times greater • Black drum 12.8 times greater • Snook 5.3 times greater • Striped mullet 2.6 times greater
Kisite Marine National Park, Kenya	5	coral reef	• Snappers, emperors and groupers were more abundant in the park and appear to be spilling over into fishing grounds.
Punta El Lacho, Chile	2	temperate, rocky, intertidal	• The commercially important marine snail, loco, increased in density from 5 to 14 times and doubled in body size.
Barbados Marine Reserve	11	coral reef	• 18 of 24 species were bigger in the reserve.
Exuma Cays Land and Sea Park, Bahamas	36	tropical seagrass meadow	• Adult queen conch 15 times greater in reserve. • Late stage larval densities 4-17 times higher.
Exuma Cays Land and Sea Park, Bahamas	10	coral reef	• Reproductive output of Nassau grouper 6 times greater in reserve.
Hawaii Marine Life Conservation Districts	unknown	coral reef	• Fishes 63% more abundant in areas protected from fishing.
De Hoop Marine Reserve, South Africa	2	warm temperate rocky reef	• Experimental catch per unit effort increased by up to five fold for 6 out of 10 of the most commercially important species.
Saba Marine Park, Saba, Netherlands	4	coral reef	• Biomass of target species in reserve more than twice that in fishing areas.
Hol Chan Marine Reserve, Belize	4	coral reef	• On average, biomass of target species in reserve double that in fishing areas. • In some parts of reserve, biomass was 10 times greater.
Anse Chastanet Reserve, St Lucia	2	coral reef	• Total biomass of commercially important species more than double that in fishing areas.
Ras Mohammed Marine Park, Egypt	15	coral reef	• Mean biomass of fish was 1.2 times greater on protected reef.

Three Kenyan Marine Parks: Malindi, Watumu, Kisite	unknown	coral reef	• Of the 110 species recorded on protected reefs, 52 were not found in fished areas. • In Malindi and Watumu there was no difference in abundance of commercially important species inside vs outside reserve.
South Lagoon Marine Park, New Caledonia	5	coral reef	• Within protected areas, the species richness of fish populations increased by 67%, density by 160% and biomass by 246% but the average size of most species did not increase.
Banyuls-Cerbere Marine Reserve, France	6	warm temperate rocky reef	• 18 target species were bigger in reserves.
Shady Cove, San Juan Islands, Washington, USA	7	temperate rocky reef	• Lingcod were nearly 3 times more abundant in the reserve.
Edmonds Underwater Park, Washington, USA	27	temperate rocky reef	• The number of rockfish eggs and larvae originating from within the park is 55 times greater than outside. • For lingcod, the number of eggs and larvae originating from within the park is 20 times greater.
Anacapa Island, Channel Islands, California, USA	20	warm temperate rocky reef	• Densities of commercially expoited red sea urchin were 9 times higher in the reserve than in nearby fished areas.
Tsitsikamma National Park, South Africa	22	rocky reef	• Of three species studied, one was 4 times more abundant and another 13 times more abundant in the reserve. • Bream were on average twice as big when protected.
Sumilon Island Reserve, Phillipines	10	coral reef	• 18 mths after fishing was resumed in the reserve, the total yield of fish was 54% less.
Apo Island Reserve, Phillipines	10	coral reef	• The biomass of predators increased 8 fold in the reserve. • In fishing grounds mean density and species richness of large predators also increased.
Kyoto Prefecture Closure, Japan	4	temperate sand and mud bottom	• The proportion of large male snow crabs increased by 32% in the closed area.
Maria Island Reserve, Tasmania	6	temperate rocky reef	• 260% increase in the number of rock lobsters within the reserve. • Rock lobsters produce 10 times more eggs than those outside reserve. • Bastard trumpeter showed an incredible 100 fold increase.

APPENDIX 3: DECISION-MAKING CRITERIA FOR MATAITAI USING A WEIGHTING EXERCISE.

Criteria	Weighting
ECOLOGICAL	No ecological criteria given under *Customary Fishing Regulations 1998*.
○ Habitats are replicated	
○ Area to include representative, special, and unique habitats	
○ Offshore & deepwater habitats to 12nm limit most be included	
○ Size of the area is ecologically self-sustaining	
○ There are at least 2 no-take (marine reserves) zones within the Mataitai to protect biodiversity and recover ecological integrity within those no-take zones.	
CULTURAL	
○ Area to include all traditional fishing grounds (eg. eeling, offshore fishing, netting)	
○ Area to be of significance to hapu (eg. wahi tapu)	
SOCIAL, ECONOMIC & MANAGEMENT	
○ Beach access	
○ Bylaw on commercial fishing where local boat owner-operators can only fish	
○ Bylaw outlining a spawning closure season & calendar	
○ Bylaw on no commercial trawling, seine netting and other forms of destructive fishing be allowed in area	

APPENDIX 4. FAQ ABOUT MATAITAI RESERVES.

(Source: http://www.mfish.govt.nz/customary/index.html)

Who can apply for a mataitai reserve?

Only tangata whenua, or Tangata Kaitiaki/Tiaki nominated by tangata whenua, can apply for a mataitai reserve in any part of their rohe moana. Any disputes over the status of tangata whenua or Tangata Kaitiaki/Tiaki must be resolved before a mataitai reserve application is lodged.

Who must be consulted on a mataitai reserve proposal?

When a mataitai reserve application is received, the Minister must publicly notify the application twice in a newspaper circulating in the area of the proposed reserve. The Minister must also call for written submissions on the application from the local community in that area. After the closing date for submissions, the Minister must call a meeting near the proposed mataitai reserve.

The local community must be consulted together by the tangata whenua and the Ministry of Fisheries. The regulations define local community as people who own land in the proximity of the proposed mataitai reserve, or people that have been resident in the area for at least three months in the preceding three years. The tangata whenua may amend their application following consultation with the local community.

Do fishers have the right to make submissions on mataitai reserve proposals?

Yes. After consulting the local community and learning of any changes that the tangata whenua have made to the application, the Minister must advertise the application and call for submissions from persons who own quota or fish, either commercially or as amateurs, in the area of the proposed mataitai reserve.

The Ministry of Fisheries will decide which newspapers are used to notify a mataitai reserve. The Ministry will need to ensure that all interested parties are properly informed of the proposal.

What happens if concerns are raised about a mataitai reserve proposal?

If the Minister of Fisheries has concerns regarding a mataitai reserve proposal, these issues can be discussed with the applicants before the Minister makes a final decision. The tangata whenua and the Minister may wish to agree on conditions for the mataitai reserve in order to address issues raised in any submissions. This will increase the likelihood of mataitai reserve proposals meeting the necessary criteria, gaining final approval and being effective.

What are the criteria which must be met for a mataitai reserve to be approved?

The Minister approves a mataitai reserve proposal when satisfied that the following criteria have been met:

- a special relationship exists between tangata whenua and the area of the proposed reserve
- the proposed reserve is a traditional fishing ground
- the proposed reserve can be effectively managed by tangata whenua
- the general management aims are consistent with the sustainable use of the fisheries resources in the area
- the proposed mataitai reserve is not a marine reserve.

The Minister must also be satisfied that the mataitai reserve will not:

- unreasonably affect the ability of the local community to take fish for non-commercial purposes; or
- prevent persons with a commercial interest in a species from taking their quota or annual catch entitlement within the Quota Management Area for that species; or
- unreasonably prevent persons with a commercial fishing permit for a non-QMS species from taking fish within the Fisheries Management Area for which that permit has been issued; or
- unreasonably prevent non-commercial fishers from fishing within the Quota Management Area or Fisheries Management Area for that species.

The criteria take account of the fact that a mataitai reserve could have impacts on other users of the fishery, such as commercial and recreational fishers. However, the Minister will not decline a mataitai reserve proposal simply because the area is used by commercial or recreational fishers. As long as commercial and recreational fishers are able to fish successfully in other parts of the Quota Management or Fisheries Management Area, the Minister may approve the mataitai reserve proposal.

Once a mataitai reserve has been approved and notified in the Gazette, the Minister must confirm and notify the appointment of Tangata Kaitiaki/Tiaki chosen by the tangata whenua to manage the mataitai reserve.

Is the overall number of mataitai reserves taken into account by the Minister?

Yes. The Minister will take into account any other mataitai reserves within the Quota Management Area or Fisheries Management Area when the potential effects of any new proposal are assessed. So while the first proposals for mataitai reserves within a particular area may be approved, later applications may not because of the cumulative impact of all the reserves on commercial and/or recreational fishing.

Tangata whenua organisations should work with neighbouring tangata whenua and local communities on the development of their mataitai reserve proposals. This will help ensure that mataitai reserves are spread evenly around the coast and that everyone's needs are met.

APPENDIX 5: DECISION-MAKING CRITERIA FOR NO-TAKE (MARINE RESERVE) ZONES USING A WEIGHTING EXERCISE.

Criteria	Weighting
ECOLOGICAL	
○ The system will contain special, unique and representative habitats	
○ Habitats are replicated i) A minimum of two of similar habitat types are included in reserves to enable meaningful comparison ii) Replicates safeguard against unexpected failures or collapse of populations	
○ Natural ecological processes are protected	
○ The size of the individual marine reserves are ecologically self-sustaining, may have an impact on local fisheries, preserves genetic diversity	
○ Use the best possible available information for decision-making, which is not only scientific but local anecdotal evidence. i) The absence of scientific certainty should not be a reason for postponing measures to establish fully protected representative ecosystems ii) Favour decisions that are informative and reversible	
○ Connectivity of habitats	
○ 5km coastline be adopted as a minimum size for a coastal reserve i) this is suggested as a rule of thumb, this is largely based on experiences with the edge effect studied in established marine reserves (Babcock et. al. 2002, Cole et. al. 2000, Willis et al. 2001) ii) generally the larger the area of the reserve and the greater number of connected habitats included will result in more species benefiting, (Roberts 2001)	
○ Estuary to be included in area to meet connectivity between habitats criteria. All zones of estuary be included: lower, middle and upper zones.	
○ Seaward boundaries to extend to at least 100m depth contour or 2 nautical miles where possible	
SOCIAL, ECONOMIC & MANAGEMENT	
○ Ensure that the system provides for local community management	
○ Sites are permanent with a generational review with the possibility of some site becoming a rahui or tapu a. To enable long term changes to be measured and assessed b. To allow for the fullest possible range of ecosystem functions to be supported and maintained	
○ Ensure economic and educational opportunities will exist with the local community	
○ Area is suitable for compliance purposes (eg. rectangle rather than octagon shaped areas)	
○ Large area rather than multiple of small areas	
○ Beach or land access, rather than boat	

CULTURAL	
○ The system will support the mataitai	
○ Tangata whenua have significant role in management	

APPENDIX 6. MARINE RESERVE PROCESS

New Zealand has 18 marine reserves. The process to establish a marine reserve is intensive (see Figure 25). A detailed step-by-step guideline is available at:
http://www.doc.govt.nz/Conservation/Marine-and-Coastal/Marine-Reserves/001~Handbook-for-Prospective-Applicants/index.asp

Figure 25. The marine reserve process (Source: www.doc.govt.nz)