

**Marine Reserve Application
Tawharanui Marine Reserve
(Re-notified)**

Marine Reserve Application Tawharanui Marine Reserve

A Re-notified Application by the Auckland Regional Council
April 2007



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1. INTRODUCTION

1.1 Application for a Marine Reserve

This is the second notification of this application. Due to a technical error with the first notification in August 2006, the Auckland Regional Council has decided, in consultation with the Department of Conservation, to re-notify the application.

The Auckland Regional Council (ARC) proposes to change the legal and management status of the existing Tawharanui Marine Park (Managed by the Ministry of Fisheries (MFISH) under the Fisheries Act 1996) to Marine Reserve (Managed by the Department of Conservation (DoC) under the Marine Reserves Act 1971).

This change will mean that:

1. The existing restrictions on taking or disturbing of marine life within the Marine Park will continue to apply.
2. The marine reserve boundary will differ slightly from the existing marine park boundary to enable better clarity for users of the reserve and adjacent areas.
3. Rules affecting use of the Marine Reserve will be clearer and more widely understood than with the existing Marine Park, given that rules are consistent from one marine reserve to another but can differ between marine parks.
4. Management of the Marine Reserve will formally reflect ARC's and DoC's responsibilities to establish sustainable and meaningful management partnerships with Tangata Whenua.
5. The Marine Reserve will be managed under a consistent regime with the nearby Cape Rodney Okakari Point Marine Reserve, rather than under two separate authorities as is currently the case.
6. The combination of all of the above factors will lead to greater protection of the marine area and eco-systems within it, leading to enhanced opportunities for the scientific study of marine life at Tawharanui.

1.2 Marine Reserves and The Department of Conservation

In 1987, the Department of Conservation was formed and became responsible for managing the Marine Reserves Act 1971. One of the Department's aims is "to conserve the natural character and quality of the coastal and marine environments of New Zealand". Establishing a network of marine reserves is one method of achieving this.

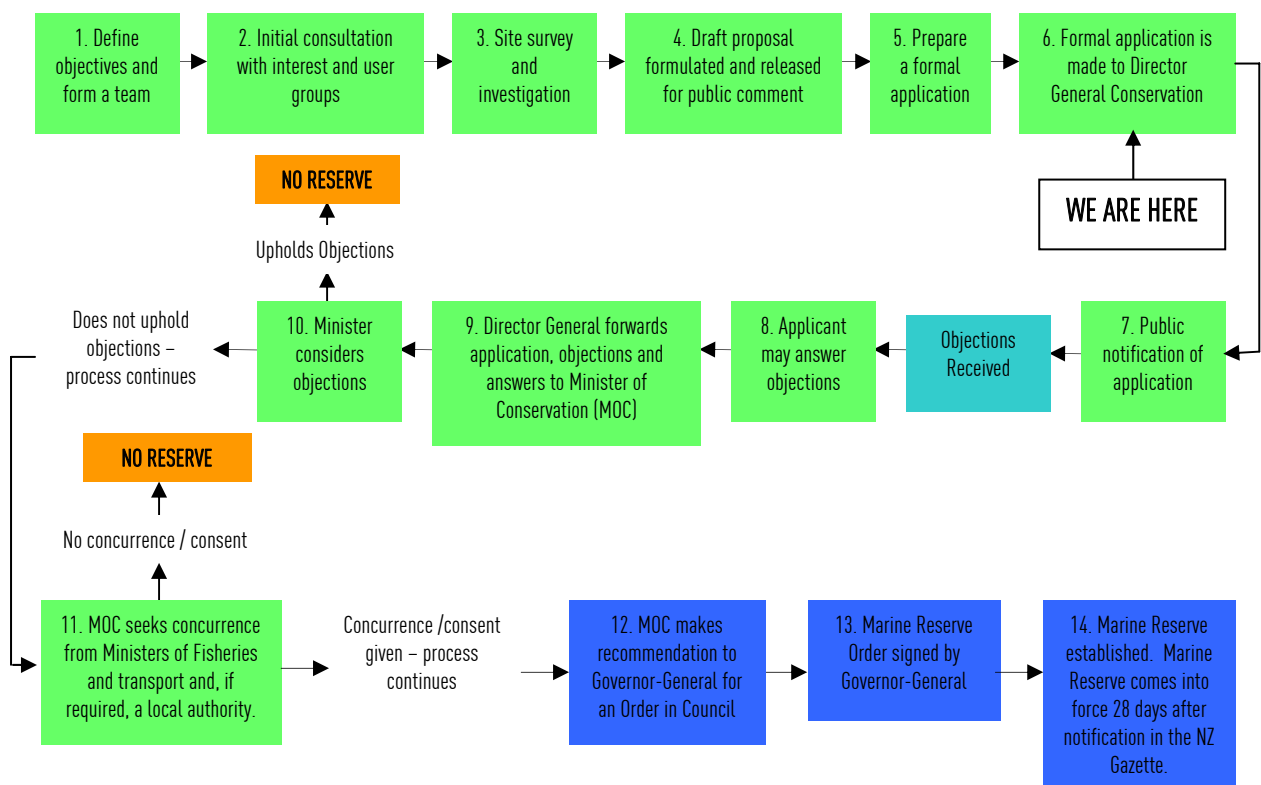
A marine reserve is a specified area of the territorial sea, seabed and foreshore which is set up and managed for the purpose of preserving it in a natural state as a habitat for marine life for scientific study. In addition to their main purpose of preserving areas for scientific study, marine reserves also provide a number of other benefits. These include the recognition and protection of marine habitats and organisms for their intrinsic worth, educational opportunities, new opportunities for recreation and tourism, potential refuge, feeding and nursery areas for fish and other organisms, and yardsticks for assessing the impacts or management of adjacent terrestrial and marine resources.

Any area below MHS and within the territorial sea or internal waters of New Zealand (provided no lease or licence under the Marine Farming Act 1971 is in force) may become a marine reserve. A size limit is not specified.

Section 3(1) of the Act contains a wide brief of the types of areas suitable to be marine reserves. Reserves may be established in areas "that contain underwater scenery, natural features, or marine life of such distinctive quality, or so typical, or beautiful, or unique, that their continued preservation is in the natural interest". In addition to the Director General of Conservation, many organisations are able to make marine reserve applications. Other organisations that may apply include:

- Any university (within the meaning of the Universities Act 1961).
- Any body appointed to administer land (subject to the Reserves Act 1977), which has frontage onto the sea.
- Any incorporated society engaged or having as one of its objectives the scientific study of marine life or natural history.

1.3 Process for Establishing a Marine Reserve



1.4 Responses Invited

A public notice in the Rodney Times and in national newspapers will call upon anyone wishing to object to this application to do so in writing no later than 10 July 2007. Any submissions in support that may be received will also be accepted, if in writing and received no later than 10 July 2007. Objections and submissions in support should be addressed to:

Director General of Conservation
Department of Conservation
Auckland Conservancy
Private Bag 68-908
Newton
Auckland

Fax: (09) 377 2919

Email: tawharanui@doc.govt.nz

2. THE APPLICATION

2.1 The Applicant

The applicant is the Auckland Regional Council (ARC), a regional authority whose role is established under the Local Government Act 2002 as being to give effect to the purpose of local government. These purposes are to enable democratic local decision-making and action by and on behalf of communities, and to promote the social economic, environmental and cultural well-being of communities, in the present and for the future. The ARC, in performing its responsibilities, must act in accordance with the principles established in the Act and within its wider legislative framework. Key legislation enabling the ARC to perform its functions includes the Local Government Act 2002, Resource Management Act 1991, Biosecurity Act 1993, Civil Defence Emergency Management Act 2002, Transit New Zealand Act 1989, Land Transport Management Act 2003, Transport Services Licensing Act 1989, Reserves Act 1977, Hazardous Substances and New Organisms Act 1996 and Hauraki Gulf Marine Park Act 2000.

The ARC's Mission, as stated in its 2005/2006 Annual Plan is:

"Working in partnership with our regional community to achieve social, economic, cultural and environmental well-being."

The ARC works in a number of key areas to achieve this mission, two of which are particularly relevant to this Marine Reserve application.

Regional Parks

"The ARC aims to:

- *Manage and enhance the regional parks network so that it provides maximum community and environmental benefit.*
- *Provide parks that together offer a diverse range of high quality natural settings and that are representative of the region's heritage.*
- *Provide parks that are safe to visit, examples of environmental excellence, and relevant to all sectors of the community."*

Coastal Management

"The ARC has a principal role in looking after the coastal environment. We are responsible for managing the use and development of the coast, protecting and enhancing the natural character (beaches, estuaries, dunes and cliffs), and ensuring that the quality of coastal water is maintained or enhanced".

The ARC manages approximately 40,000 hectares of parkland on behalf of the people of the Auckland region. These parks range from farmland and bush wilderness to sandy beaches. One of these parks, Tawharanui Regional Park, located approximately 20 minutes north of Warkworth, is a significant terrestrial conservation area. 533 hectares of this 588 hectare park have been set aside as an open sanctuary for native flora and fauna developed in partnership with the local community.

Immediately adjacent to the north of the open sanctuary is the Tawharanui Marine Park. This 378 hectare marine park was established through the initiative of the (then) Auckland Regional Authority (now the ARC) under the Fisheries Regulation and Harbours Act 1950 (since superseded by the Resource Management Act 1991). It was the first of its kind to be established and is to this day still only one of two marine parks established under this legislation. The only other marine park established under the Harbours Act 1950 is Mimiwhangata Marine Park in Northland. Tawharanui Marine Park has been jointly monitored and managed by the Ministry of Fisheries and the ARC.

2.2 Location

Tawharanui Marine Park is located approximately 90 kilometres north of Auckland City on the northern side of the Tokatu Peninsula (*Figure 1*). The Tokatu Peninsula separates Omaha Bay from Kawau Bay. The marine park abuts and complements the ARC's Tawharanui Regional Park and Open (wildlife) Sanctuary.



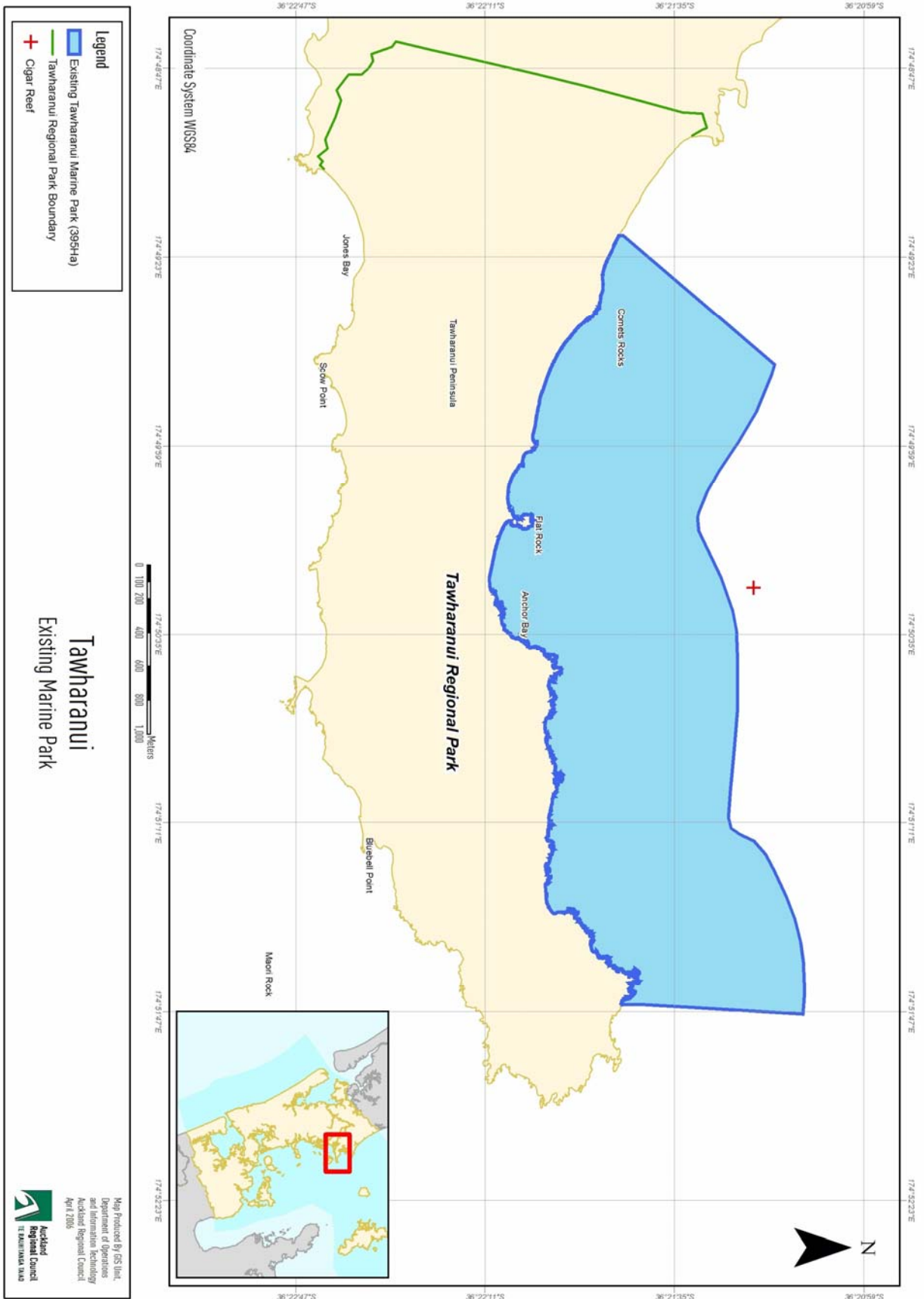
Figure 1

2.3 Name

The name of the proposed marine reserve is the Tawharanui Marine Reserve.

2.4 Boundaries

Figure 2



The boundaries of the existing Tawharanui Marine Park are illustrated in *Figure 2* above.

The eastern and western boundaries of the Tawharanui Marine Park are marked on the land by “special marks”, being orange and white triangular in-line markers.

Eastern Boundary

The eastern boundary, near Tokatu Point, is due north from a prominent headland, and is marked by two in-line orange and white triangles. When the triangles are aligned, the boundary line is true. MHWS at this point is at grid reference 36°21.3's, 174°51.7'e. These markers can be clearly seen from the sea in most conditions.

Western Boundary

The western boundary is located at MHWS 650 metres east of Pukehinhini Point and is marked by two in-line orange and white triangles located in the sand dunes at grid reference 36°21.4's, 174°49.56'e. These markers are not clearly visible from the sea due to poor siting.

Seaward Boundary

The seaward (northern boundary) is not physically marked but is depicted on plans and maps as following a line approximately half a nautical mile (926 metres) from mean high water springs (MHWS). For this reason, it does not run in a straight line but follows the line of the coast, making it practically impossible to physically mark.

The ARC proposes that, as part of this application to change the status of the marine park to marine reserve, the western and seaward boundaries of the protected area are amended to resolve the issues noted above.

Western Boundary Adjustment

The ARC proposes to move the western boundary approximately 100 metres further west, so that it is sited approximately 550 metres east of Pukehinhini Point. This will allow the special in-line triangular marks to be located on the crest of a large stable dune, which is backed by a prominent land contour. This will make the marks clearly visible from the sea in most conditions. The western boundary will extend true north from these marks, rather than north north east as is currently the case.

Seaward Boundary Adjustment

The ARC proposes to adjust the irregular seaward boundary of the protected area to a straight-line boundary. Straight line boundaries are supported by the Department of Conservation because they are easier to locate on marine charts and can be clearly marked.

In order to avoid “Cigar Reef”, a favoured recreational fishing location outside the existing marine park, the length of the western boundary will be reduced to approximately 329 metres and the eastern boundary reduced to approximately 850 metres .

The effect of the above adjustments will be a very slight increase in the protected area by five hectares from approximately 395 hectares (the current marine park area) to 400 hectares (the proposed marine reserve), as illustrated in Figure 3 below.

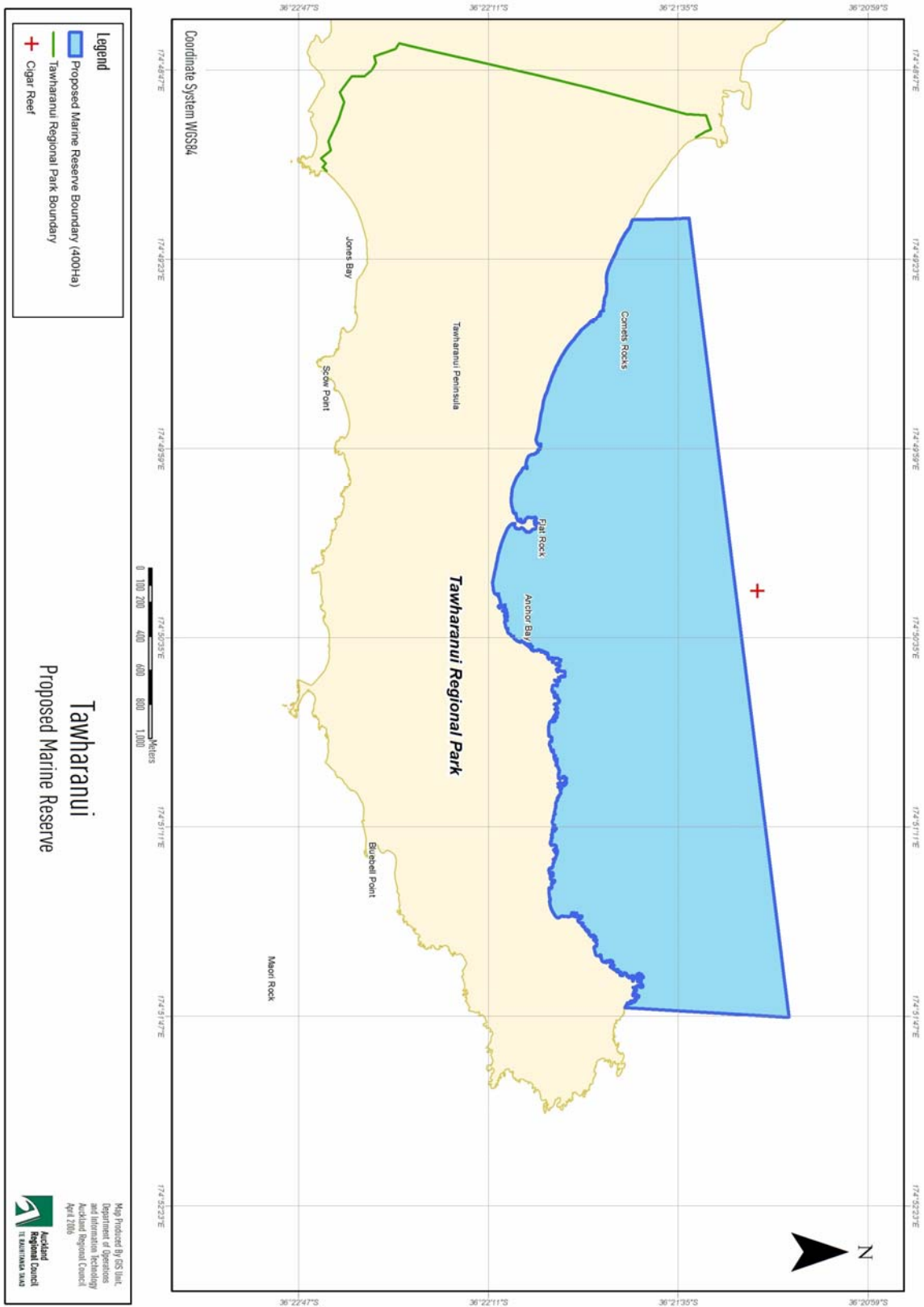


Figure 3

2.5 Objectives

The ARC has seven objectives driving its application to change the status of the Tawharanui Marine Park to the Tawharanui Marine Reserve.

1. Manage the protected marine area adjacent to Tawharanui Regional Park under a clear and widely recognised management regime.

Explanation: There are currently 28 marine reserves in New Zealand waters and only two marine parks (The Hauraki Gulf Marine Park bears the appellation 'marine park' but is established under separate legislation so is not included in this analysis). Marine reserves are generally considered to have more effective management and enforcement than marine parks, and have consistent and clear controls around them. Conversely, marine parks have park specific controls and regulations, which can lead to a lack of clarity around what activities can and can not be undertaken within them. For example, limited recreational fishing is allowed in the Mimiwhangata Marine Park but not in the Tawharanui Marine Park, whereas all fishing is excluded from all marine reserves.

2. Review the boundaries of the marine protected area at Tawharanui to make them clearer to users and visitors, and easier to monitor and enforce.
3. See the protected marine area adjacent to Tawharanui Regional Park as part of a network of marine protected areas, managed by one agency.

Explanation: Tawharanui Marine Park is currently managed as a separate protection area by the Ministry of Fisheries and the Auckland Regional Council, while within 50 kilometres, there are two marine reserves managed by the Department of Conservation as part of a much larger network (Cape Rodney-Okakiri Point and Long Bay Marine Reserves).

4. Establish a marine reserve committee to assist with the management of the Marine Reserve. This committee could potentially involve representatives from local tangata whenua (Ngati Manuhiri), Department of Conservation, Tawharanui Open Sanctuary Society (TOSSI) Auckland Regional Council, and other key stakeholders as appropriate. Such a Committee would enhance community ownership, protection and promotion of the Tawharanui Marine Reserve.

Explanation: There are two separate precedents for this type of arrangement, one relating to Ngati Manuhiri and the other to marine reserve committees.

The Tawharanui Open Sanctuary, while officially managed by the ARC, in effect relies on the work of a steering committee made up of ARC officers, Ngati Manuhiri representatives, community representatives and other key stakeholders. Under this arrangement Ngati Manuhiri retains a strong and active working partnership with the ARC in the management of the Open Sanctuary. It is this type of relationship that Ngati Manuhiri and the ARC are looking to replicate in relation to the proposed Marine Reserve.

In terms of marine reserves, the Tapuwae o Rongokako Marine Reserve has a marine reserve committee which provides advice to DoC on a range of matters to aid the management of the marine reserve. Nine members form the committee and are from the following groups: Ngati Konohi, commercial fishers, recreational fishers, Forest & Bird, and East Coast Hawke's Bay Conservation

Board. While the sections in the Marine Reserves Act relating to marine reserve management committees were repealed some time ago, community advisory committees consisting of representatives from tangata whenua, community groups etc can be established to help with the management of marine reserves. These committees can be set up by the Minister of Conservation under section 56 of the Conservation Act 1987.

5. Provide quality marine educational and recreational opportunities for the people of New Zealand.
6. Further enhance the ability of extensively harvested marine species such as spiny lobster and snapper, and the communities they are part of, to recover to a natural state.
7. Provide a quality site to enable scientific study of the value and benefits of marine reserves, and to enable study of natural marine population and community dynamics.

2.6 Natural Values (e.g. Marine Habitat and Coastal Setting Descriptions)

Land Sea Integration

Tawharanui Regional Park covers an area of 588 hectares managed by the Auckland Regional Council as part of an extensive regional parks network. Tawharanui Regional Park is comprised of approximately 170 hectares of pasture, 300 hectares of bush and dune lands, 80 hectares of wetlands and 40 hectares of recreational open space. The majority of this land area is now a protected open sanctuary for developed in partnership with the community for the protection of native species. A marine reserve on the northern boundary would complement the land based Tawharanui Open Sanctuary and provide for integrated management of both land and sea.

Unique Geology

Like Kawau Island, Ti Point and Cape Rodney, greywacke, the base rock of New Zealand, is exposed on the coast of Tawharanui in the form of massive, sometimes fractured, grey green rocks. Greywacke is seldom exposed on the Auckland mainland, being more characteristic of offshore islands. In fact the Waitemata Sandstones are more typical of the north east coastline.

At Tawharanui Waipapa Group rocks accumulated as layers of sand, silt and occasional gravel and lava flows on the ocean floor some 150 million years ago. They were deeply buried by further sediments and the resulting increased pressure and temperature compressed and slightly metamorphosed the sandstones and siltstones to hard greywacke and argillite respectively. The hilly areas of Tawharanui are carved out of greywacke, in places capped with basal Waitemata Group rocks, whereas the flat areas and dunes behind the ocean beach (and proposed marine reserve) are made of unconsolidated Holocene gravels, silts and sands.

Thinly bedded fine sandstone and siltstone at the east end of Anchor Bay contain the richest marine fossil localities of the Waipapa Group rocks anywhere in the Auckland region, providing evidence of past geological and climatic events (Sporli and Grant-Mackie 1976).

Sandy Beaches

Sandy beaches and rocky shore characterise the main intertidal habitat type within the proposed marine reserve. Ocean Beach, between Pukenihi Point and Flat Rock is 2.1km long and backed by low unmodified dunes dominated by *muehlenbeckia*. The foredunes are colonised by pingao (native sand sedge).

A small stream enters the western end of the beach and is a popular feeding area for the threatened New Zealand dotterel, which nests there, along with the threatened variable oystercatcher.

East of Flat Rock is Anchor Bay, a small sandy beach with good surf, backed by a dune colonised by pingao and spinifex. A small stream and suitable nesting areas attract New Zealand dotterel and variable oystercatchers. Scallop beds exist offshore in Omaha Bay.

Intertidal Rocky Shore

The rocky shore stretches over 3km along the coastline. Extending from Ocean Beach, Comet Rocks and Phoenix Reef form unusual swirling rock platforms, creating narrow rock pools and ridges. Mussels, catseyes, topshells, oysters and kina are the dominant marine organisms.

Flat Rock divides the main Ocean Beach from Anchor Bay. Small pools dominated by *Ecklonia* and neptune's necklace seaweed shelter kina in small numbers. To the east, the intertidal platform is more extensive, and more unstable boulder beaches occur, with lichen and a range of mollusc species. Caves and archways are a feature of this part of the coast.

Subtidal Reef

Snorkelling or scuba diving off Flat Rock reveals a range of colourful sponges, ascidians, molluscs and seaweeds. Small numbers of black-footed and white-footed paua occur around the coast, the majority of which are under the legal size limit for harvesting. Spiny lobster, snapper and other fish species are also commonly seen by snorkellers off Flat Rock and other reefs around the peninsula.

Deep Reef

At least 40 species of fish have been recorded within the proposed marine reserve (See table, Figure 4 below). These include eagle ray, yellow moray eel, longsnout pipefish, red banded perch, butterfly perch, kingfish, silver drummer, blue maomao, banded wrasse, leather jacket and red moki. Spiny lobster and snapper occur in higher densities inside than outside the marine park (Babcock et al 1999, Kelly et al 2000, Willis et al 2003) and are having well documented beneficial influences on the park's marine ecology (Cole and Keuskamp 1998, Shears et al 2002, Shears and Babcock 2004).

Birds

Sixteen species of native land birds and 15 species of native coastal birds are recorded within the Tawharanui Regional Park and around its margins. Notable amongst these are the bittern, spotless crane and fernbird from wetland areas, and the New Zealand dotterel, blue reef heron and variable oystercatcher on the shore (Auckland Regional Council, 2003). Bellbirds have also returned naturally to the open sanctuary in considerable numbers and are breeding there.

Superb Scenery

Large boulders and sheer drop-offs create impressive underwater scenery and ideal spiny lobster habitat. Old red moki have used the same holes and caves for refuge for at least the past 21 years. Bottle nosed dolphins are commonly observed close inshore, and pilot whales also visit occasionally.

KEY

A = abundant (seen in schools)

C = common (seen in small numbers)

F = frequent (often seen singly or in pairs)

O = occasional

R = rare (not often seen)

Short-tailed stingray	F	Two spot demoiselle	R	Oblique swimming	F	Graham's gudgeon	R
Long-tailed stingray	R	Trevally	C	triplefin	F	Crested blenny	F
Eagle ray	F	English mackerel	R	Marblefish	F	Mimic blenny	F
Yellow moray	O	Jack mackerel	F	Red moki	F	Black goby	R
Northern conger eel	F	Kahawai	C	Porae	F	Blue cod	F
Rock cod	F	Snapper	C	Yellow-eyed mullet	R	Leather jacket	F
Piper	F	Red mullet	A	Grey mullet	R	Porcupine fish	R
Slender roughy	F	Bartailed goatfish	R	Spotty	A	Anchovy	O
Common roughy	F	Bigeye	A	Banded wrasse	F	Pilchard	R
John dory	F	Parore	F	Scarlet wrass	O	Scorpionfish	F
Longsnout pipefish	F	Silver drummer	C	Hiwihwi	F	Crested weedfish	R
Red banded perch	O	Sweep	A	Yaldwyns triplefin	F	Spotted stargazer	R
Butterfly perch	C	Blue maomao	C	Mottled triplefin	F	Butterfish	R
Hoheru	C	Kingfish	C	Spectacled triplefin	F	Blue-eyed triplefin	F

Figure 4

2.7 Other Values (e.g. Cultural, Historical, Recreation, Education)

Cultural

Early Maori occupied the area and the Tokatu Peninsula. Echoes of Maori history are reflected by the names which remain in use and numerous archaeological features. Tokatu (upstanding rock) at the end of the peninsula was a landmark known throughout the region as an important navigational aid to the numerous waka travellers moving along the coast. The name Tawharanui means "the abundant edible bracts" of the kiekie vine and is used symbolically to refer to the abundant natural resources available.

When Europeans first arrived in the area in the 1830s, it was occupied by a small hapu of the Te Kawerau people, the Ngati Raupo.

Ngati Manuhiri, who lived in the Omaha and Pakiri areas to the north, occupied Tawharanui seasonally. Strong ties were also maintained with the Ngati Rongo iwi of Mahurangi. Ngati Wai occupied the coastline between the Wairoa River and Tawharanui. The Ngai Tahu, who occupied the park area for several centuries, and later intermarried with another migrant group, held stronger links with Tawharanui.

The Marutuahu tribes of the Hauraki Gulf had an ancient dispute with the Ngati Raupo over control of the shark fishing ground (tauranga mango) on the coastline north of Whangaparaoa, and may continue to have an interest in the area.

The Maori occupants of the Tawharanui area harvested the bountiful resources of the sea. Fish bones, in particular those of the snapper (tamure), are found in almost every midden along with some 13 varieties of shell fish.

Maori occupation continued until 1873 when the land was sold. As kauri timber was milled, Tawharanui was developed as a farm, shingle was quarried from 1955 to 1967, creating the large Jones Bay lagoon.

Local names such as Phoenix Reef commemorate some of the nine vessels shipwrecked along the coast between 1871 and 1978.

Recreation

Tawharanui Regional Park attracts approximately 160,000 visitors per year.

The northern coast of Tawharanui Regional Park is commonly used for a wide range of informal recreational activities, some of which are popular because of the presence of the marine park. These activities include:

- Surfing
- Boogie boarding
- Picnicking
- Swimming
- Snorkelling / scuba diving
- Walking / jogging
- Kayaking
- Jet skiing
- Camping /camper vaning
- Fishing (outside the boundaries of the marine park).

Education

The marine park forms part of the education and interpretation programme for Tawharanui Regional Park. An ecology trail for the park incorporates both terrestrial and marine components. Interpretation displays within the park buildings and outdoor displays promote the conservation of marine life. Park rangers and other specialist staff also frequently take visitors for guided walks, which include discussion about the marine park.

Numerous school groups visit the regional park, and particularly the northern coast of the peninsula, where they use the coast and marine park as part of their education programmes. Tangata whenua are actively involved in taking guided walks and tangata whenua groups also visit the park to participate in education programmes.

3. APPLICATION BACKGROUND

3.1 Origin of Proposal

The ARC’s proposal to change the status of Tawharanui Marine Park to Tawharanui Marine Reserve originated in the mid 1990’s, from concern about changes to the standard of protection provided by the existing Marine Park status.

Tawharanui Marine Park was established in 1981 under the Harbours Act (1950) and Fisheries Regulations. At that time, the Harbours Act allowed the ARC the same powers as the Harbour Board and the Fisheries Regulations gave the power for appointment of Fisheries Officers. In 1981, marine park status gave better controls and stricter penalties than marine reserve status. Legislative changes since then though have brought marine reserve penalties into line with those applicable to marine parks. In addition, at the request of MFISH to meet its volunteer fisheries officer quota, ARC park rangers are no longer warranted Fisheries Officers, so no longer have the same authority to enforce regulations within the marine park. For these reasons, there is no longer any benefit in retaining the marine park status in preference to a marine reserve status. In fact, as outlined in this application, the benefits of marine reserve status now outweigh those of marine park status.

3.2 Early Consultation

Tawharanui Marine Park has been in place for approximately 25 years and has been widely accepted. The Regional Parks Management Plan has been reviewed twice during this time and there has been general support and no objections to the protection status of the marine park during these processes. A questionnaire, released in 1998 as part of the regional park management plan review process, and requesting feedback on the proposal to change the status of the marine park to marine reserve met with only positive feedback (Auckland Regional Council and National Research Bureau 2000).

In 1995/1996, the ARC consulted with a variety of parties over the proposed change in status. The following table provides a summary of the outcome of this consultation.

CONSULTATION ON THE PROPOSAL TO CHANGE THE STATUS OF TAWHARANUI MARINE PARK TO MARINE RESERVE			
Organisation	Support	Oppose	Reason
Rodney District Council	x		
Ministry of Fisheries			
NZ Fishing Industry Board	x		Area is properly established and managed as a no-take marine reserve, with adequate compliance/law enforcement.
Ngati Wai Trust Board			Co-management, retention of customary fishing rights.
Kawerau A Maki Trust		x	Prefer rahui, mataitai or taiapure reserve. Wish to continue to exercise harvesting rights.
Leigh Fisherman’s Association		x	Do not support individual applications, wish DOC to produce a comprehensive plan for marine reserves in the Hauraki Gulf.

3.3 Early Investigation

Tawharanui Marine Park has been subject to regular and intensive biological monitoring. Monitoring commenced in 1977, four years before the park was established, and was continued annually until 1983 (Grace 1978, 1979, 1980, 1981, 1982, 1983). Monitoring was also carried out less regularly between 1989 and 1996 (Grace 1989, 1991, Marine and Environmental Research 1994, Nuthall and Russell 1996). Additional scientific research was also carried out on spiny lobster movement in the park during this period (Kelly 1996).

Monitoring between 1977 and 1996 indicated a dramatic increase in the number of spiny lobster and an apparent increase in kina population density. There was little change in fish numbers during this period. In fact, red moki numbers within the park declined during this period despite nearly 20 years of protection. Given that red moki are highly territorial, this suggests impacts from fishing pressure or other external environmental changes have had a negative influence on the population. An alternative theory is that red moki were migrating outside the park.

3.4 Tangata Whenua Consultation

Subsequent to the early consultation noted above, the ARC produced a discussion document and entered into a more extensive round of consultation in 2003. The ARC entered into discussions with Ngati Wai regarding the marine reserve proposal. Ngati Wai's position at the time was:

- Ngati Wai should be treated as a partner in respect to the marine reserve application and future management.
- Ngati Wai would prefer the western boundary of the reserve to be off Pukenihihi Point, rather than along the beach.
- Ngati Wai customary rights in the marine reserve should be retained by the Ngati Wai Trust Board and eventually devolved to Ngati Manuhiri in their Hapu Environmental Management Plan.

In 2005 the ARC considered all previous consultation, most notably that conducted on the draft proposal in 2003, and developed its revised proposal in response to the consultation.

Since that time discussions with Ngati Manuhiri, as mana whenua of the area in question, have been held and iwi representatives provided with information on the revised proposal. Ngati Manuhiri has considered the current proposal both informally through discussions and formally through its Trust Board.

Ngati Manuhiri has indicated support for the proposal. However in providing its support Ngati Manuhiri has emphasised its desire to play an active and meaningful role in the management of the Tawharanui Marine Reserve.

In response to this the ARC proposes the establishment of a Marine Reserve Committee including Ngati Manuhiri representatives and representatives of other key stakeholder groups as appropriate.

Under the Fisheries Act 1996 and the Fisheries (Kaimoana Customary Fishing) Regulations 1998, Tangata Whenua are able, with proper authorisation from the Minister of Fisheries, to carry out traditional fishing within the boundaries of marine parks.

Ngati Manuhiri have indicated that they would like the ability to pursue traditional cultural practices in relation to the proposed marine reserve. Tangata whenua representatives have confirmed that this would amount to only occasional harvesting, on a strictly non-commercial basis, from the foreshore. Such practices would be used only in relation to marae activities (such as tangi or special hui) and only when alternative sources outside the marine reserve are exhausted. Furthermore, such practices would only take place following prior approval from the marine reserve management committee.

Under current statutes, the issue of such traditional cultural practices in a marine reserve is one that the Minister of Conservation can consider, at the request of tangata whenua, when considering an application for a marine reserve.

As part of its partnership approach to working with tangata whenua, the ARC has ensured that Ngati Manuhiri representatives have had input into the content of this application.

3.5 Draft Marine Reserve Proposal

In February 2003, the ARC released its discussion document "Proposal to Change the Status of the Tawharanui Marine Park to a Marine Reserve". This was distributed to interested parties and made available to the general public. The discussion document included a reply form for people to make formal submissions. The release of the document was followed by a number of public and key stakeholder meetings.

Key elements of the discussion document were the proposed expansion of the protected area to approximately 585 hectares and the straightening of the boundaries.

The discussion document stated that:

"The purpose of this discussion document is to seek comment from individuals and groups on this proposal. These comments will be used to amend the proposal. The revised proposal will then be put to the Director General of Conservation as an application for a marine reserve under the Marine Reserves Act 1971."

Significant amendments to proposal have been made as a result of consultation. (See *Issues and Concerns/Conflict Resolution, Including Boundary Selection* below) and are reflected throughout the application document.

3.6 Public Response to the Draft Proposal

Eighty-seven submissions were received in response to the draft proposal. The clear majority of submissions were in objection to the proposal and were based on two points. Of these two points, the expansion of the protected area was the main point raised in objection to the proposal.

3.7 Issues and Concerns/Conflict Resolution, Including Boundary Selection

The main points raised in opposition to the draft proposal and the applicants response to them are as follows:

- Objections to the marine park becoming a marine reserve because submitters did not want DoC managing it.

Resolution: the ARC recommends, as part of this application, the establishment of a marine reserve committee (potentially including representatives from DoC, Tangata Whenua, TQSSI, ARC and other key stakeholders as appropriate) with responsibility for assisting with management of the marine reserve.

- Objections to the seaward boundary of the marine protected area being moved to further seaward to include a popular recreational fishing spot (Cigar Reef).

Resolution: the ARC resolved to amend the seaward boundary of the proposed marine reserve significantly to reduce the expansion of the protected area and exclude Cigar Reef.

4. IMPLICATIONS FOR CURRENT USES AND USERS, AND OTHER GROUPS

4.1 Adjoining Landowners

The proposed marine reserve adjoins Tawharanui Regional Park which is owned by the applicant. There are no other adjoining landowners.

4.2 Tangata Whenua

As highlighted throughout this application, tangata whenua are supportive of the application and have identified a number of positive impacts of the proposed marine reserve.

These include active participation in the management of the marine reserve through the proposed management committee. (In contrast to the current management arrangement with the Tawharanui Marine Park, the ARC is proposing that a marine reserve committee is established to assist with the management of Tawharanui Marine Reserve. This committee would provide tangata whenua, and other key stakeholders with meaningful and ongoing input into the management of the marine reserve). Tangata whenua representatives have also identified the potential for providing and participating in enhanced education and recreational activities.

4.3 Commercial Fishers

Given that there is currently no commercial fishing permitted in the Tawharanui Marine Park, there will be little effect on commercial fishing operators as a result of a change of status to marine reserve. The very slight increase in the size of the protected area proposed in this application will likely have only very minor effect, if any, on commercial fishing interests operating in the area.

It should be noted that effects on this sector of the community have been minimised with the revision of the proposed boundaries in response to concerns about the expansion of the protection area received during consultation in 2003.

In addition, the straightening of the boundaries for the protected areas and the improved location of land-based markers (on the western boundary) will add clarity to the protected area for all users including commercial fishing operators.

4.4 Charter Boat Operators

Given that there is currently no recreational or commercial fishing permitted in the Tawharanui Marine Park, there will be little effect on fishing charter boat operators as a result of a change of status to

marine reserve. The very slight increase in the size of the protected area proposed in this application will likely have only a very minor effect, if any, on fishing charter boat operators operating in the area.

It should be noted that effects on this sector of the community have been minimised with the revision of the proposed boundaries in response to concerns about the expansion of the protected area received during consultation in 2003.

In addition, the straightening of the boundaries for the protected areas and the improved location of land-based markers (on the western boundary) will add clarity to the protected area for all users including charter boat operators.

4.5 Recreational Fishers

Given that there is currently no recreational fishing permitted in the Tawharanui Marine Park, there will be little effect on recreational fishers as a result of a change of status to marine reserve. The very slight increase in the size of the protected area proposed in this application will likely have only a very minor effect, if any, on recreational fishers using the area.

It should be noted that effects on this sector of the community have been minimised with the revision of the proposed boundaries in response to concerns about the expansion of the protected area received during consultation in 2003.

In addition, the straightening of the boundaries for the protected areas and the improved location of land-based markers (on the western boundary) will add clarity to the protected area for all users including recreational fishers.

4.6 Divers

Given that there is currently no commercial/recreational fishing or harvesting permitted in the Tawharanui Marine Park, there will be little effect on divers as a result of a change of status to marine reserve. The slight increase in area of the protected area proposed in this application will likely have only very minor effect on divers engaged in harvesting or fishing in the area.

It should be noted that effects on this sector of the community have been minimised with the revision of the proposed boundaries in response to concerns about the expansion of the protection area received during consultation in 2003.

In addition, the straightening of the boundaries for the protected areas and the improved location of land-based markers (on the western boundary) will add clarity to the protected area for all users including divers.

4.7 Non-Extractive Recreational Users

There is likely to be minimal or no negative impact for recreational users in or around the reserve who do not extract any form of marine life.

In fact, the enhanced protection for the area as a marine reserve has the potential to enhance the experience of recreational users such as snorkellers, divers and even casual visitors. It is possible that additional recreational experiences, such as those offered by the glass-bottomed boat operator at Goat Island could feature at Tawharanui in the future. Tangata whenua have expressed a specific interest in providing such recreation and educational activities if the area becomes a marine reserve.

4.8 Scientific Interests

There is likely to be no negative impact on scientific interests in or around the reserve.

In fact, by enhancing the protection of the proposed marine reserve's natural and scientific values it is expected that scientific interests have the potential to benefit significantly from the creation of a marine reserve at Tawharanui. Consistent management regimes with other marine reserves will likely improve the comparability of sites being scientifically studied. A marine reserve adjacent to the terrestrial open sanctuary would create a unique juxtaposition and in terms of eco system management, restoration and opportunities for scientific research.

4.9 Educational Interests

There is likely to be no negative impact on educational interests in or around the reserve.

In fact, marine reserve status would provide the potential for educators using the site or the adjacent regional park to be an outlet for consistent marine reserve educational messages applicable not only at Tawharanui but also to marine reserves throughout the rest of New Zealand. All park visitors could be targeted with messages applicable to marine reserves throughout the country.

4.10 Conservation Interests

There is likely to be no negative impact on conservation interests in or around the reserve.

In fact, it is also anticipated that the marine reserve status (being more widely understood than the current marine park status) would result in less infringement and therefore lead to improved conservation of the species within the protected area.

5. JUSTIFICATION

5.1 Meets Purpose of Marine Reserves Act (Section 3(1))

"It is hereby declared that the provisions of this Act shall have effect for the purpose of preserving, as marine reserves for the scientific study of marine life, areas of New Zealand that contain underwater scenery, natural features, or marine life, of such distinctive quality, or so typical, or beautiful, or unique, that their continued preservation is in the national interest." Section 3(1) Marine Reserves Act).

The Tawharanui Marine Park has been in existence for approximately 25 years and was only the third marine protected area to be established in New Zealand waters (after the Cape Rodney/Okakiri Point and Poor Knights Islands Marine Reserves).

The value of the Tawharanui Marine Park is recognised in the Auckland Regional Plan: Coastal, which classifies the marine park as a Coastal Protection Area 1 and is afforded the highest level of protection available in the Plan. Coastal Protection Area 1 sites are of regional, national or international significance and are considered vulnerable to the adverse effects of subdivision, use and development. The proposed plan identifies the values of the park as:

"The northern side (82b) and the tip (82a) of the peninsula are the best examples of open rocky intertidal and subtidal marine habitats on the coast of the outer Hauraki Gulf. Here is found a small geological exposure of fossils in Jurassic rocks (82c). This is a very rare occurrence in Northland and consequently the exposure is of national importance and has been selected by the Department of Conservation as an Area of Significant Conservation Value (ASCV). The open sandy beaches (82b) are also important as the mobile sands are an important New Zealand dotterel breeding area as well as being a threatened plant habitat. The majority of this area (82b) is included in the marine protected area associated with Tawharanui Regional Park."

5.2 Scientific Values

"...the existence of reserves increases our expectations of what is natural, and demonstrates that in some systems conservation of large predators can lead to the re-establishment of lost trophic interactions." (Shears and Babcock, 2002: 141)

The Tawharanui Marine Park has, since its gazettal, been a valuable site for scientific study and monitoring (Babcock et al 1999; Cole and Keuskamp 1998; Grace 1978, 1979, 1980, 1981, 1982, 1983, 1989, 1991; Kelly 2001; Kelly et al 1999; Kelly et al 2000; Marine Environmental Research 1994; Nuthall and Russell 1996; Shears and Babcock 2002, 2004a, 2004b; Shears et al 2005; Willis et al 2003). Being one of the oldest marine protected areas in New Zealand makes it especially significant for monitoring the long-term impacts of commercial and recreational fishing on marine communities. Research to date has provided key information to support continued protection and establishment of marine areas, particularly in respect to heavily targeted marine species such as snapper and spiny lobster and the important roles they play in maintaining balanced reef ecology. Key results have been found in three research areas.

1. Comparisons of population recovery within and outside the Tawharanui Marine Park

There is strong evidence to show the value marine reserves have in protecting and enhancing coastal marine species and communities. Research at Tawharanui Marine Park and Cape Rodney Okakari Point Marine Reserve has provided a large part of this evidence. Snapper and spiny lobster within the marine park are more abundant, larger and more reproductively prolific than outside it.

Willis et al (2003) found that snapper relative density and egg production were higher inside the marine park than outside it. They compared three marine protected areas (including Tawharanui Marine Park) with similar unprotected areas outside them and found that the density of legal sized snapper within the protected areas was 14 times higher than in the unprotected areas. These results are consistent with the earlier work of Babcock et al (1999) at Tawharanui and Cape Rodney Okakari Point who found snapper were 5.75 times more abundant in the marine park than outside and that they were also considerably larger (316mm mean length within the marine park compared to 186mm mean length outside it).

Similarly, Kelly et al (2000) found that spiny lobster populations increased 3.9% per year in shallow water and 9.5% per year in deep water within four marine protected areas including Tawharanui Marine Park. They also found that the mean carapace length of spiny lobsters within the study areas increased 1.14mm per year of protection. From these results, they concluded that protection of these marine areas had resulted in increased spiny lobster biomass and egg production. Once again, this is consistent with the earlier investigations of Babcock et al (1999) who found spiny lobsters to be 1.6 times more abundant and considerably larger (109.9mm compared to 93.5mm mean carapace length) within the marine park than outside it. They concluded that the marine protected areas they were studying clearly indicated higher levels of primary and secondary productivity and trophic complexity than their study areas outside them.

2. Community changes occurring within the Tawharanui Marine Park

“Trophic cascades are defined as predatory interactions involving three or more trophic levels, whereby primary carnivores indirectly increase plant abundance by suppressing herbivores” Shears et al (2002: 131 after Enge 1995).

Both spiny lobster and snapper are secondary predator species and both are heavily targeted by both commercial and recreational fishers. The differences between populations of these two species within and outside Tawharanui Marine Park has provided a better understanding of the concept of trophic cascades in New Zealand marine areas, particularly in respect to the impact of sea urchins on macroalgae (seaweeds) and the role of secondary predators in maintaining a balance.

Scientific studies have provided a clear indication that both spiny lobster and snapper play an important role in controlling sea urchin populations and thus reducing predation of macroalgae on coastal reefs. Cole and Keuskamp (1998) were the first to find that urchin populations within the marine park showed a bimodal population structure, with higher levels of predation of mid sized urchins compared to outside the marine park.

Further work by Shears et al (2002) clearly showed that rates of predation on urchins was higher, that urchin densities were lower and that macroalgal forest cover was higher within the marine park

than outside. They found that small urchins tended to be “cryptic” (living in cracks and crevices) while the larger urchins tended to occupy exposed parts of the reef. The medium sized urchins in transition between these two phases were susceptible to predation, hence the bimodal population structure. Because they produced consistent results over multiple sites, they could confidently conclude that the results were not a result of site specific environmental factors such as nutrient supply. This illustrates the value of Tawharanui Marine Park in a network of marine protected areas and the scientific and conservation benefits that can be gained from managing it under a consistent regime.

Shears and Babcock (2004) supported the effect of secondary predators on coastal reef communities but also found that the trophic cascade concept was not so relevant to sites subject to high levels of environmental stress such as sedimentation, turbidity and freshwater runoff (for example Long Bay Marine Reserve). They concluded that for this reason, future marine reserves should be carefully selected.

3. Spiny lobster behaviour and ecology within the Tawharanui Marine Park

Valuable research into the behaviour and ecology of spiny lobster has been undertaken at Tawharanui Marine Park, resulting in new understanding of the species life cycle that can be applied to the design of future marine reserves.

Kelly et al (1999) produced the first report on daytime aggregations of male and female lobsters. They found that spiny lobsters were not as dependent on coastal reefs as previously thought, but actually aggregate in large numbers in offshore areas of no or low relief. The aggregations appeared to be formed as a protective mechanism, with the lobsters displaying gregarious “mobbing” behaviour. Kelly et al proposed several reasons for the aggregations, based on feeding and reproductive cycles.

They found male lobsters tended to form aggregations soon after ecdysis (moulting), at the same time as maximum food consumption. Given that the sand flats where they were aggregating have a high abundance of potential prey, they were able to form a correlation. The other time of the year when the males tended to form aggregations (toward the end of the mating season) also coincided with a high level of food consumption.

Female lobsters formed aggregations mainly around the time that the young larvae hatched. Kelly et al concluded that they moved offshore at this time to permit rapid dispersal of the larvae away from reef dwelling planktivores. They noted that the female lobsters also had high levels of food consumption during this period.

The study concluded that, because spiny lobster populations are particularly vulnerable to harvesting during aggregation periods, aggregation sites should be clearly identified and included within the boundaries of any new marine reserves.

Kelly (2001) found that spiny lobsters at Tawharanui Marine Park didn't display previously accepted nomadic behaviours, but that they didn't tend to move large distances at all. He found that over a period of 12 months, the furthest any lobster within his sample moved in one direction was 3.1km. He found that most lobsters did move away from the coastal reefs for short periods during the year during moulting, reproductive and feeding cycles.

5.3 Meets Other Legislative Criteria

The site of the proposed marine reserve is not an area where there is a lease or licence under the Marine Farming Act 1971 (4(1)), and is not within the jurisdiction of any harbour board (4(2)). The formation of a marine reserve will not have any affect on the Coal Mines Act 1979, the Mining Act 1926 and 1971, the Petroleum Act 1937, the Iron or Steel Industry Act 1959 or the Continental Shelf Act 1964 (4(4)).

5.4 Has Widespread Support

The proposed establishment of a Marine Reserve has widespread support among many key stakeholders. This application is supported by the area's territorial local authority (Rodney District Council) local iwi (Ngati Manuhiri as a hapu of Ngati Wai) and the Tawharanui Open Sanctuary Society (the local community organisation which works in partnership with the adjacent land owner (the applicant) in managing the land. Endorsements are included with this application as Appendix 1.

While there was considerable opposition, especially from commercial and recreational fishers, to the proposal outlined in the 2003 discussion document, the ARC has amended the proposal to minimise effects on these sectors of the community. The New Zealand Recreational Fishing Council president has had input into the amended proposal.

6. PROPOSED MANAGEMENT

6.1 Level of Protection

No extraction or disturbance of marine life, other than for approved scientific and management purposes or traditional harvesting (if approved by the Minister of Conservation) will be permitted within the marine reserve.

6.2 Public Access, Navigation and Anchoring

The main public access to the proposed marine reserve will be through Tawharanui Regional Park. The nearest boat ramp, which is the main one for the area, is at Omaha Beach. There are a number of other boat ramps between the Mahurangi Harbour and Tawharanui. Small boats can be hand launched at Jones Bay on the southern coast of the peninsula and at the Anchor Bay carpark during calm sea conditions.

Navigation within the marine reserve would be permitted provided it does not harm the marine life in the reserve.

6.3 Identification of Boundaries

The marine reserve would be clearly marked at both the eastern tip of the Tokatu Peninsula and at the western end of Ocean Beach.

The seaward boundary may be marked at its eastern and western extremes by appropriate markers. Such markers would need to be wave resistant given the prevailing sea conditions in the area. The seaward boundary would be a straight line between the markers.

The location of the boundaries would also be graphically displayed at key boat launching ramps in the area (e.g. Leigh, Mahurangi), on park notice boards and in information leaflets. Land Information New Zealand (LINZ) currently publishes the marine park boundaries in charts of the area. Such charts (hard-copy and electronic) would be revised in the future to include the marine reserve boundaries.

6.4 Enforcement Matters

Compliance and law enforcement activities would be undertaken by the Department of Conservation with potential assistance from the ARC, tangata whenua and community representatives.

6.5 Scientific Study and Monitoring

Tawharanui Marine Park is one of the oldest and most intensively studied marine protected areas in New Zealand. It has been subject to consistent scientific research and monitoring since its establishment. It is expected that this level of study and monitoring will continue or increase if the area becomes a marine reserve.

6.6 Education and Interpretation

The Auckland Regional Council will, in partnership with the Department of Conservation, and Tangata Whenua, publicise the marine reserve through displays in information buildings at Tawharanui Regional Park, in pamphlets, at appropriate public talks, media features and through electronic media (e.g. web pages). Education activities consistent with the marine reserve status will be encouraged.

6.7 Management Proposal

The ARC proposes that the future management of the marine reserve reflect the resources available and DOC's and ARC's Treaty of Waitangi obligations. While responsibility for management of the marine reserve would ultimately rest with DoC, assistance could potentially be provided by ARC, TOSSI and Tangata Whenua through a Marine Reserve Committee with clear terms of reference.

7. SUMMARY

The Tawharanui Marine Reserve application seeks to change the status of the area currently known as the Tawharanui Marine Park to a marine reserve. The proposed marine reserve would be approximately the same size as the current marine park, however the existing boundaries have been altered (straightened) to give the protected area more clarity. The proposed marine reserve lies to the north of and adjacent to Tawharanui Regional Park and there are no other adjacent landowners.

The proposed marine reserve would enhance the existing protection of the area's natural and scientific values. The application satisfies the requirements of the Marine Reserves Act 1971, and would make an important contribution to the establishment of a marine reserve network, incorporating representative examples of the full range of habitats and ecosystems found in New Zealand's marine environment.

8. REFERENCES

- Auckland Regional Council (2003) Regional Parks Management Plan Volume 2 : Resource Inventory.
- Babcock R.C., Kelly S., Shears N.T., Walker J.W. and Willis T.J., (1999) Changes in community structure in temperate marine reserves. *Marine Ecology Progress Series* 189: 125-134.
- Cole R.G. and Keuskamp D., (1998) Indirect effects of protection from exploitation: patterns from populations of *Evechinus chloroticus* (Echinoidea) in northeastern New Zealand. *Marine Ecological Progress Series* 173: 215-226.
- Grace R.V., (1978) Tawharanui Marine Monitoring Programme. Report on first year. Unpublished report prepared for the Auckland Regional Authority.
- Grace R.V., (1979) Tawharanui Marine Monitoring Programme. Unpublished report prepared for the Auckland Regional Authority.
- Grace R.V., (1980) Tawharanui Marine Monitoring Programme. Report on progress. Unpublished report prepared for the Auckland Regional Authority.
- Grace R.V., (1981) Tawharanui Marine Monitoring Programme. Report on progress. Unpublished report prepared for the Auckland Regional Authority.
- Grace R.V., (1982) Tawharanui Marine Monitoring Programme. Report on progress. Unpublished report prepared for the Auckland Regional Authority.
- Grace R.V., (1983) Tawharanui Marine Monitoring Programme. Report on progress. Unpublished report prepared for the Auckland Regional Authority.
- Grace R.V., (1989) Tawharanui Marine Monitoring Programme. Unpublished report prepared for the Auckland Regional Authority.
- Grace R.V., (1991) Tawharanui Marine Monitoring Programme. Unpublished report prepared for the Auckland Regional Council.
- Kelly S., (2001) Temporal variation in the movement of the spiny lobster *Jasus edwardsii*. *Marine Freshwater Research* 52: 323-331.
- Kelly S., MacDiarmid A.B. and Babcock R.C., (1999) Characteristics of spiny lobster, *Jasus edwardsii*, aggregations in exposed reef and sandy areas. *Marine Freshwater Research* 50: 409-416.
- Kelly S., Scott D., MacDiarmid A.B. and Babcock R.C., (2000) Spiny lobster, *Jasus edwardsii*, recovery in New Zealand marine reserves. *Biological Conservation* 92: 359-369.
- Marine Environmental Research, (1994) Tawharanui Marine Monitoring Programme. Report of progress 1994. Unpublished report prepared for the Auckland Regional Council.
- Nuthall S. and Russell A., (1996) Tawharanui Regional Park Marine Survey. Unpublished report for the Auckland Regional Council.
- Shears N.T. and Babcock R.C., (2002) Marine reserves demonstrate top-down control of community structure on temperate reefs. *Oecologia* 132: 131-142.
- Shears N.T. and Babcock R.C., (2004a) Indirect effects of marine reserve protection on New Zealand's rocky coastal marine communities. *DOC Science Internal Series* 192: 48pp.
- Shears N.T. and Babcock R.C., (2004b) Community composition and structure of shallow subtidal reefs in northeastern New Zealand. *Science for Conservation* 245: 65pp.
- Shears N.T., Grace R.V., Usmara N.R., Kerr V. and Babcock R.C., (In press) Long term trends in lobster populations in a partially protected vs. no-take Marine Park. *Biological Conservation*
- Sporli K.B. and Grant-Mackie, (1976) Upper Jurassic fossils from the Waipapa Group of Tawharanui Peninsula, North Auckland, New Zealand. *New Zealand Journal of Geology and Geophysics* 19(1): 21-34.
- Willis T.J., Millar R.B. and Babcock R.C., (2003) Protection of exploited fish in temperate regions: high density and biomass of snapper *Pagrus auratus* (Sparidae) in northern New Zealand marine reserves. *Journal of Applied Ecology* 40: 214-227.

9. APPENDICES

Appendix 1

Endorsements.

Appendix 2

Copy of the formal notice of intention to apply for a marine reserve at Tawharanui.