

Fifteen times the size of our land area, New Zealand's marine environment is home to an estimated 80% of our biodiversity.

Scientists tell us that by far the biggest threat to this biological wealth is fishing.

Workshops on this paper are being organised Auckland, Wellington, Christchurch and Dunedin. For more details, contact ECO or Forest and Bird.

New Zealand's oceans are teeming with life. To date, some 8000 marine species have been identified. 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.

Scientists also tell us that by far the biggest threat to this biological wealth is fishing. Over the last twenty years, evidence of the impacts of fishing on our unique underwater environment has been mounting. In just the last decade, we have seen the collapse of scallop fisheries in Northland and the dramatic decline of the Bluff oyster beds.

Unless we change the way we manage our fisheries, the future for the marine environment looks bleak. Not only do we risk causing major and irreversible species loss, but we may also bring about the extinction of species we have yet to discover. Bluff oysters could be off the menu for good.

An Environmental Management Strategy

In response to growing concerns about the impacts of fishing on the marine environment, the Ministry of Fisheries is developing an **Environmental Management Strategy (EMS)**. The objectives of the EMS are to:

- Achieve meaningful improvements in managing the environmental impacts of fishing; and
- Ensure the Ministry's obligations under the Fisheries Act 1996 and other legislation are carried out in an efficient and consistent manner.

As part of the process of developing the Strategy, the Ministry has asked ECO and Forest and Bird to:

- Identify and rank environmental stakeholders' concerns about the management of fisheries-related impacts on the aquatic environment;
- Identify the appropriate balance between protection and use of fishery resources required to address these concerns;
- Identify opportunities for environmental stakeholders to work with tangata whenua and other fishery stakeholders to achieve shared environmental goals.

Have your say

ECO and Forest and Bird have prepared this document so you can contribute to the process. The document outlines the key impacts of fishing on the marine environment and identifies gaps in the current management framework. **A four-page questionnaire is included to enable you to provide feedback on the issues discussed.**

Please complete and return your questionnaire by **16 November 2001** to:

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1. Fishing for the facts: impacts of fishing on the marine environment

1.1 The state of our fisheries

New Zealand manages the world's fourth largest fishing zone. Last year, more than three quarters of a million tonnes of fish and shellfish were extracted from our oceans, earning the fishing industry over \$1.5 billion.

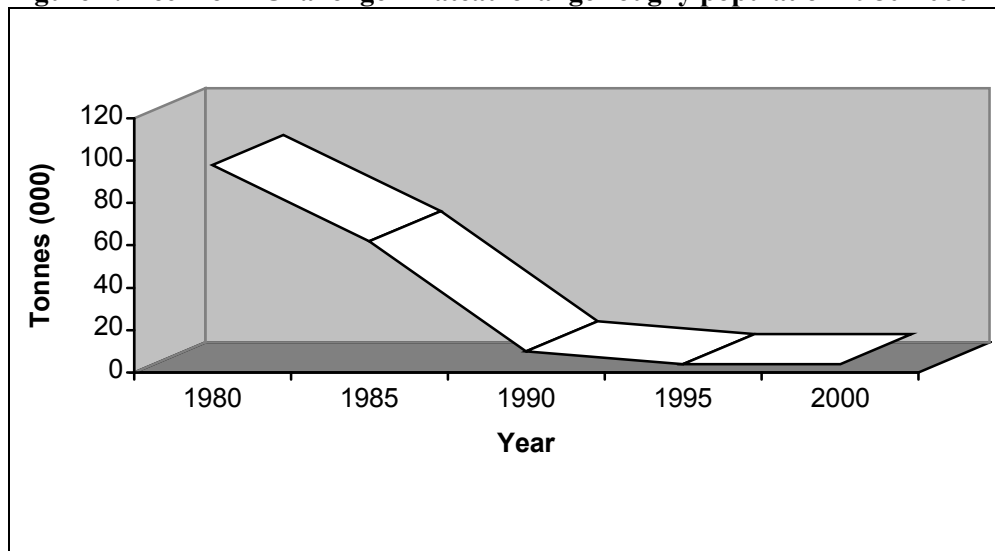
Our knowledge of the state of our fisheries is poor.

Despite its size and significance, current knowledge of the state of our fisheries is poor. Of the 236 commercial fish stocks currently managed by the quota management system (QMS), population size 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.

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 unfished size.

Figure 1: Decline in Challenger Plateau orange roughy population 1980-2000



Where information is available, the news is not good.

Stocks of orange roughy, oreos, snapper and rock lobster have been severely overfished. Some populations have been reduced to 3% of their unfished size.

Orange roughy and oreos are particularly vulnerable to overfishing because they are long-lived, slow growing species. Orange roughy can live up to 120-130 years, only reaching maturity at 33-34 years. Black oreos can live more than 150 years. These characteristics mean they are slow to recover from overfishing.

Table 1: The state of our fisheries

Species (stock)	Population remaining (%)
Rock lobster (south)	4%
Hoki (eastern)	21%
Hoki (western)	38%
Paua (Marlborough)	17%
Paua (South Island)	22%
Snapper (West Coast North Island)	9%
Snapper (Hauraki/Bay of Plenty)	16%
Orange roughy (Challenger Plateau)	3%

Even some of our "short-lived" species are now facing an uncertain future. Scallops, which live for little more than four or five years, have been fished to very low levels in both Northland and the Coromandel. Scientific evidence shows hoki stocks are also in decline.

Substantial catch reductions are now needed for populations to be restored to sustainable levels.

1.2 Marine matters

Fishing not only affects commercial fish stocks but it also impacts significantly on marine ecosystems. Like land-based ecosystems, marine ecosystems are complex and interrelated. Impacts on one part of the system can impact on the ability of other parts to function properly. For example, reducing the numbers of one fish species can cause flow-on effects for other associated or dependent species. The end result can be major, sometimes irreversible, biodiversity loss.

1.2.1 The “bycatch” problem

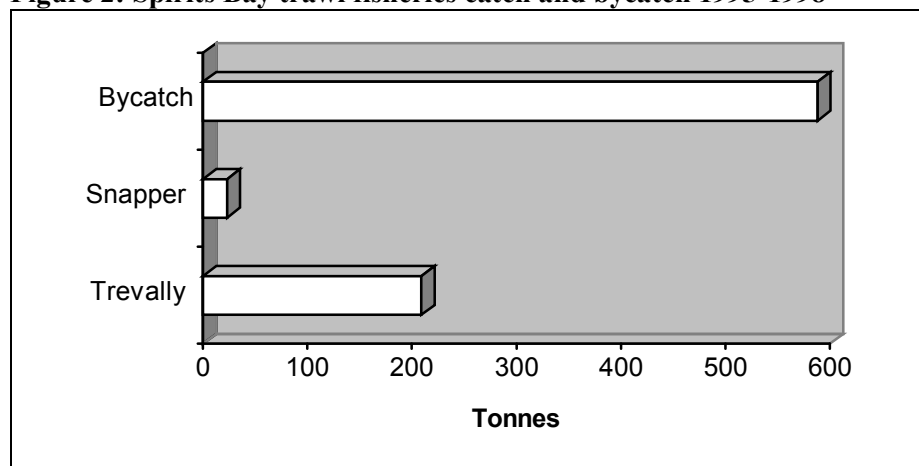
Compelling evidence of the impact of fishing on marine communities can be seen in the rate of “bycatch”. Bycatch is the term used to describe the catch of “non-target” species. Worldwide, an estimated 18 to 40 million tonnes of bycatch is discarded by the fishing industry each year.¹

Among the “non-target” species caught and discarded are large numbers of marine invertebrates, marine mammals and seabirds. In New Zealand, each year around 700-1000 fur seals and 1100 seabirds – mostly albatross species - are drowned in trawl nets. These nets are huge - big enough to hold the Cook Strait ferry. Dragged through the ocean, they trap or crush everything in their path.

Large bycatches of seabirds are also caught and drowned by longlines. Long lines, up to 100km in length and set with thousands of baited hooks, are cast behind fishing boats. Seabirds dive down to get the bait, get caught on the hook and drown. New Zealand’s tuna longline fleet is estimated to catch as many as 6000 seabirds per year. Most albatross and many petrel species are now considered to be threatened by fishing. In just the last 25 years, the Antipodean wandering albatross population has declined by 63%. During the same period, over 35,000 grey petrels have been killed.

In many fisheries, the amount of bycatch can exceed the catch of the “target” species. A Ministry of Fisheries study found trawlers in Northland’s Spirits Bay recorded more bycatch than the trevally and snapper they were targeting. In some instances, bycatch was up to five times more than the target catch landed.²

Figure 2: Spirits Bay trawl fisheries catch and bycatch 1995-1998



Source: Parliamentary Commissioner for the Environment (1999)

Like land-based ecosystems, marine ecosystems are complex and interrelated. Impacts on one part of the system can impact on the ability of other parts to function properly.

Compelling evidence of the impacts of fishing on marine ecosystems can be seen in the incidence of “bycatch”.

Trawl nets - big enough to hold the Cook Strait ferry – are dragged through the ocean trapping everything in their way.

¹ FAO Fisheries Department (1999). *The State of the World Fisheries and Aquaculture 1998*, Food and Agriculture Organisation of the United Nations, Rome.

² Parliamentary Commissioner for the Environment (1999) *Setting Course for a Sustainable Future: The Management of New Zealand’s Marine Environment*, Wellington, p64.

Similar stories can be told about other fisheries. The hoki fishery alone has caught around 26,000 tonnes of non-target species each year for the last 10 years. The southern bluefin tuna fishery catches such a huge number of sharks that it should really be called a “shark fishery”. In some areas, bluefin tuna is less than 5% of the total catch.

The same trawlers and dredges that can cause huge loss in marine populations can also have a major impact on marine habitats.

Hector’s dolphin

Found only in New Zealand, Hector’s dolphin is the world’s rarest marine dolphin with a population of only 4000. The main threat to the dolphin’s survival today is set nets. In 1998, over 25 dolphins were killed in set nets around the South Island coast. This year, the Minister for Fisheries banned setnetting along 400 kilometres of the North Island’s west coast where only 100 dolphins now survive. The fishing industry is appealing the Minister’s decision.

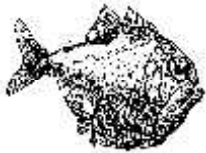
1.2.2 Impacts of fishing methods

The same trawlers and dredges that cause huge disturbance to marine populations can also have a major impact on marine habitats and marine invertebrate communities. In heavily fished areas, the ocean floor can be trawled or dredged several times a year, scraping or ploughing the seabed, disrupting sediment, damaging habitat and killing large numbers of bottom-dwelling organisms.

Huge damage is done to seamounts. Seamounts are underwater islands, submerged beneath the waterline.

Enormous damage is also done to seamounts. Seamounts are “underwater islands”, submerged hundreds of metres beneath the waterline. More than 700 seamounts are estimated to exist in the waters around New Zealand. Many are larger and higher than Mt Cook.

These underwater rises are known to be rich in biodiversity, home to nearly 200 fish species and 169 species of “macro-invertebrates”- corals, starfish, brittle stars, sea eggs, crustaceans and barnacles. Many of these species are new to science.



Despite their biological importance, seamounts are routinely trawled for orange roughy and oreos. Huge nets, designed to roll over the ocean floor, are dragged repeatedly over the seamounts crushing everything in their path. Forests of coral trees, up to five metres high and between 300-500 years old, are cut down in the process. After repeated trawling, these treasure troves of biodiversity are turned into rock and rubble. At present, only 19 seamounts are protected from trawling and dredging.

Inshore, marine farming is now emerging as another threat to marine habitats. Marine farming can cause significant impacts on the seabed and marine fauna and flora. Mussel farms, for example, can smother sponges, corals and other marine species. Over 35,000 hectares of the seabed is currently under application for mussel farm permits – an area bigger than Paparoa National Park.

Spirits Bay and Tom Bowling Bay – an underwater Amazon

Spirits Bay and neighbouring Tom Bowling Bay are located on the northern most shore of New Zealand’s north cape. Since the early 1990s, the Bays have been intensively dredged for scallops. In the mid 1990s, concern about the impacts of the scallop fishery was raised after surveys found that the area supported an unparalleled diversity of rare and unusual marine species, including more than 200 sea sponges and 170 corals. Scientists found that these same species were highly vulnerable to damage from scallop dredges.

After intense pressure from environmentalists, iwi and others, regulations came into force in late 1999 prohibiting commercial fishers from taking scallops from parts of the Bays. But the regulations are likely to be too little too late for this unique underwater ecosystem. The areas closed to fishing are small and trawling and dredging is still permitted in surrounding areas. In early 1999, a survey found that scallops had almost completely disappeared from the Bays. Gone too is the “sponge garden”, renowned for its exceptional biodiversity.

The Fisheries Act 1996 sets out the requirements for the management of fisheries in New Zealand.



The purpose of the Act is to “*provide for the utilisation of fisheries resources while ensuring sustainability*”.

2.1 Legislation

The Fisheries Act 1996

The Fisheries Act establishes the framework for the management of fisheries in New Zealand. The Ministry of Fisheries is responsible for administering the Fisheries Act.

The Act has a clear purpose and principles aimed at ensuring fisheries are sustainably managed.

- **Purpose**

The purpose of the Act is to:

provide for the utilisation of fisheries resources while ensuring sustainability.

Under the Act, “ensuring sustainability” is defined as:

- (a) *Maintaining the potential of fisheries resources to meet the reasonably foreseeable needs of future generations; and*
- (b) *Avoiding, remedying or mitigating any adverse effects of fishing on the aquatic environment.*

“Utilisation” means:

conserving, using, enhancing and developing fisheries resources to enable people to provide for their social, economic and cultural well-being.

“Fisheries resources” includes all aquatic life.

- **Environmental Principles**

Section 9 of the Act sets out the environmental principles that must be taken into account when decisions are made. These principles are:

- (a) *Associated and dependent species should be maintained above a level that ensures their long-term viability;*
- (b) *Biological diversity of the aquatic environment should be maintained;*
- (c) *Habitat of particular significance for fisheries management should be protected.*

- **Information Principles**

The Act also sets out four information principles which form a type of precautionary approach. These principles are:

- (a) *Decisions should be based on the best available information;*
- (b) *Decision makers should consider any uncertainty in the information available in any case;*
- (c) *Decision makers should be cautious when information is uncertain, unreliable or inadequate;*
- (d) *The absence of, or any uncertainty in, any information should not be used as a reason for postponing or failing to take any measure to achieve the purpose of the Act.*

3. Putting the Act into practice – how well has the Ministry done?

Managing the environmental impacts of fishing has taken a back seat.

Despite the obligations contained in the purpose and principle of the Fisheries Act, the Ministry of Fisheries has done little to manage the environmental impacts of fishing.

A 1999 report on the performance of the Ministry by the Office of the Auditor-General 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.

3.1 Improving fisheries management – An ecosystem approach

To meet its environmental obligations, ECO and Forest and Bird believe the Ministry needs to develop an **ecosystem approach** to fisheries management. Ecosystem management aims to maintain both ecological processes and biological diversity. Key aspects of ecosystem management are set out below.

The Ministry needs to develop an **ecosystem approach** to fisheries management.

Key Principles of Ecosystem Management

1. Independent monitoring and research

Decision-making needs to be informed by independent monitoring and research to ensure the environmental impacts of fishing can be managed.

2. Integrated policy and planning

An integrated approach to management is required to ensure decision-making recognises the interrelationships between and within marine ecosystems.

3. A precautionary approach

The precautionary approach calls for “risk-averse” decisions which recognise the uncertainty involved in decisions about complex marine ecosystems. Where information is uncertain, the benefit of doubt should be given to the environment.

4. Open public participation processes

Open public processes for policy and plan development are required to ensure decision-making takes into account public views and community values.

5. Environmental impact assessment

Decision-making needs to be informed by an assessment of the actual and potential environmental impacts, including an assessment of any impacts which may arise over time.

6. Establishing marine reserves and protected areas

A comprehensive area of marine reserves should be set aside to protect marine biodiversity from the impacts of fishing.

Ecosystem management aims to maintain both ecological processes and biological diversity.

4. Identifying the problems with current fisheries management

Opportunities to take part in decision-making processes under the Fisheries Act are limited.

To ensure an ecosystem approach to fisheries management, gaps in the current management framework first need to be addressed. ECO and Forest and Bird have identified the following key problems with present management processes.

4.1 Limited opportunities for public input

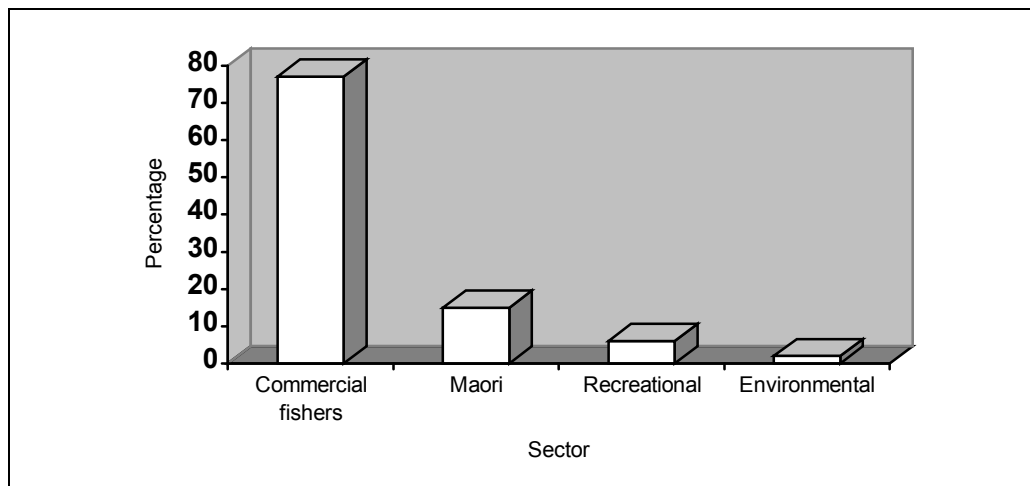
Opportunities to take part in decision-making processes under the Fisheries Act are limited. Unlike the Resource Management Act where anybody can take part in policy and planning processes, participation under the Fisheries Act is generally restricted to “approved parties”. Approved party status is given only to recognised “stakeholders” who can satisfy the Ministry they have a valid interest in the process. ECO and Forest and Bird are among the few environmental groups that have been granted “approved party” status.

Some informal opportunities for public participation exist through fisheries liaison committees which operate at the local level. However, these committees do not have any legal standing and there is no formal process for public input.

In practice, the majority of parties taking part in fisheries processes represent commercial fishing interests. Commercial sector representatives consistently out-number environmental and other interests. Figure 3 shows the participation of approved parties in meetings to review information on the state of fish stocks.

Figure 3: Participation of approved parties in stock assessment meetings

Commercial sector representatives consistently out-number environmental and other interests in consultation processes.



Source: Parliamentary Commissioner for the Environment (1999)

Commercial fishers made up nearly 80% of the participating parties – over three times as much as all other parties combined. Maori representatives comprised 15%, recreational fishing interests 6% and environmental interests just 2%.

Lack of resources presents another significant barrier to participation by non-commercial interests. While the commercial sector has substantial resources to call on to fund its participation, tangata whenua, environmental and other interests often struggle to take part. The Parliamentary Commissioner for the Environment’s 1999 report on the management of New Zealand’s marine environment noted:

Commercial sector representatives and government officials are funded to participate in what can be extended sessions.... Participation is not necessarily an easy matter for representatives of tangata whenua, the recreational sector and conservation groups.

Question: How should the public be involved in fisheries management?
Put your suggestions on page 2 of the enclosed questionnaire.

To date, fisheries research has focused largely on a small number of commercially important fish species.

4.2 Gaps in information and research

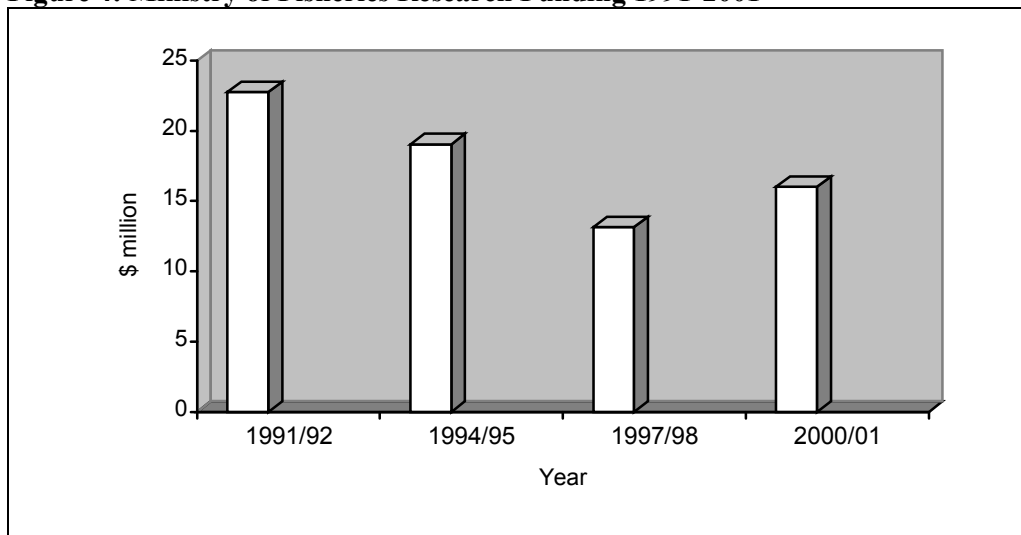
To date, fisheries research has focused largely on a small number of commercially important fish species. As a result, little funding has been given to research projects to assess the impacts of fishing on the marine environment.

One of the main reasons why research has focused primarily on commercial fish species is the way research priorities are set. The process for identifying priorities is not open to the public. Instead, input is limited to groups the Ministry recognises as “stakeholders”. Like other consultation processes under the Act, the majority of stakeholder groups taking part come from the commercial fishing sector.

Throughout much of the last decade, the dominance of the commercial sector has resulted in sustained pressure not only to prevent research projects with an environmental focus but also to cut the Ministry’s research budget. In 1991/92, research funding was set at around \$23 million. By 1997/98, funding had been cut to just \$13 million.

Funding levels have been partially restored since, rising to \$16 million in 2000/01, but still remain below 1991/92 levels. The research budget for 2001/02 is \$20 million.

Figure 4: Ministry of Fisheries Research Funding 1991-2001



Source: Office of the Auditor General (1999)

Questions: How should research priorities be set? Who should commission fisheries research?
Put your suggestions on page 3 of the enclosed questionnaire.

The potential for the commercial sector to influence research priorities has been increased by recent changes to the Fisheries Act. These changes enhance the ability of the fishing industry to carry out research on the Ministry’s behalf. There are very real dangers in allowing the industry to influence fisheries research in this way, not least in the potential for bias in the research results. Unless research is carried out in an environment free from commercial influence, there can be no guarantee the results will provide accurate and reliable information to ensure sustainable outcomes.

4.3 Failure to take a precautionary approach and assess environmental impacts

The precautionary approach is recognised internationally as a key element of fisheries management. The information principles of the Fisheries Act (see page 5) include a version of the precautionary approach, obliging decision-makers to take a “cautious approach” where information is uncertain.

Despite this obligation, more often than not management processes have responded to fishing impacts only after damage to the environment has been done.

A case in point is the Foveaux Strait oyster fishery (see box). Around the world, examples

Question: What needs to be done to ensure the environmental impacts of fishing are assessed? See page 3 of the enclosed questionnaire.

can be found of other fisheries where the story is the same – failure to recognise the potential environmental impacts of fishing activity has resulted in the decline of fish stocks and significant damage to marine environments. In some cases, fisheries have collapsed altogether.

The Bluff Oyster Story

One of New Zealand’s oldest fisheries, the Foveaux Strait oyster fishery is now struggling to survive. Catch rates started to decline in the fishery back in the 1960s. The response of fishers to the decline was to develop a heavier and more efficient oyster dredge, which succeeded in bringing catch rates back up. However, the increase was short-lived. By the late 1970s rates started to fall sharply.

In 1986, the fishery was closed early after the oyster population became infected by the bonamia parasite. The combined effect of the parasite and decades of overfishing saw catch rates continue to plummet until the fishery was closed again in 1993. Between 1993-95, there was no commercial harvest. In the years since, the catch limit has been set at around 19,000 sacks, compared with 170,000 in 1962.

Not only have many of the oyster beds been fished right down, but huge damage has been done to the underwater reefs that provide the oysters’ habitat. Little has been done to limit or exclude dredging from the area. Scientists estimate it may take more than 75 years for the reefs to recover.

The differences between the RMA and the Fisheries Act highlight the deficiencies in the present planning requirements of the Fisheries Act.

4.4 Lack of integrated policy and planning

The principle of integrated management is a key part of our legislation relating to land-based activities. In practice, integrated management means decisions about resource use need to take into account the likely effects on other parts of the environment.

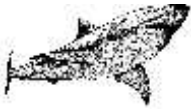
The framework of policies and plans established by the Resource Management Act (RMA) is designed to make sure this occurs when decisions are made about land-based activities. Under the Fisheries Act, however, there are no requirements to put in place policies and plans to ensure an integrated approach to management. Without this policy framework, fisheries management has focused on managing single fish stocks with little recognition of how decisions impact on the other parts of the marine environment.

Recent amendments to the Fisheries Act have introduced provisions enabling the preparation of fisheries plans. However, fisheries plans are not like policies and plans prepared under the RMA. First, fisheries plans are optional whereas regional policy statements and district plans are mandatory. Second, there is very little detail in the Fisheries Act on the content of fisheries plans and what they should cover. In contrast, the scope of regional policy statements (RPSs) is specified clearly in the RMA. Among other things, RPSs must state the significant resource management issues of the region and the environmental results anticipated from policies and methods.

Question: Do the policy and planning provisions of the RMA provide an appropriate model for fisheries management? See page 3 of the questionnaire.

Another important difference is the limited requirements for public participation in the preparation of fisheries plans. The RMA sets out a three-stage public process for participation in policy statements and plans. There is also a further right to appeal matters to the Environment Court. In contrast, the Fisheries Act requires only that there should be consultation with “representatives” of interested groups.

One of the major differences between resource management and fisheries plans is that fisheries plans do not have to be prepared by a statutory body. The Fisheries Act says anyone can prepare a fisheries plan. The idea behind this provision is to enable the commercial sector to develop its own plans. This is a lot like letting the mining industry write plans that control mining on conservation land.



The differences between resource management and fisheries plans highlight the lack of planning requirements in the Fisheries Act. While the Environmental Management Strategy being prepared by the Ministry may help to address some of the gaps in the planning framework, the EMS is not a statutory document and it will not be legally binding. It is not clear what status the EMS will have in decision-making processes.

Table 2: Planning and public participation requirements of RMA and Fisheries Act

Requirements	RMA	Fisheries Act
Mandatory policies and plans	<ul style="list-style-type: none"> ▪ National and regional coastal policy statements ▪ Regional policy statements ▪ District plans 	None
Public participation processes	<ul style="list-style-type: none"> ▪ Three stage public submission process. ▪ Right of appeal to the Environment Court. 	Participation restricted to “approved parties” or recognised stakeholders.

Question:
What needs to be done to ensure the values and priorities of other groups are recognised in fisheries management processes? See page 3 of the questionnaire.

4.5 Problems with the property rights approach to management

Since the 1980s, commercial fishing access has been controlled primarily by the quota management system (QMS). Under the system, the proportion of fish each fisher is entitled to catch is determined by the amount of “annual catch entitlement” (ACE) s/he owns.

The intention of the QMS was to create a “market” where fishing “rights” could be bought and sold. When the system was introduced, it was argued that quota ownership would give fishers a greater stake in the future of the fishery and act as an incentive to manage the resource sustainably. In practice, however, there is little evidence this has occurred.

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.

Together with the limited opportunities for public input into fisheries processes noted above, the property rights approach has meant commercial interests have dominated decision-making. Recognition of concerns held by tangata whenua and environmental interests has been minimal. In effect, the property rights approach has meant a public resource has been managed primarily for private, commercial interests.

4.6 Lack of marine reserves and protected areas

Marine reserves are areas set aside to preserve the marine habitat in its natural state. So far only 15 marine reserves have been established, protecting species in just 4 per cent of New Zealand’s territorial waters. In comparison, around 30% of our land area is protected in parks and reserves.

Around the world, the declining health of our oceans has created a critical need for more effective management of marine biodiversity. Fully protected marine reserves are a key tool to help reverse widespread overfishing and habitat disturbance.

There are many potential advantages of marine reserves including:

- protection of spawning fish populations;

Fully protected marine reserves are a key tool to help reverse widespread overfishing and habitat disturbance.

Question: what proportion of New Zealand's marine environment should be protected? See page 3 of the questionnaire.

- maintenance of areas of undisturbed habitat;
- protection of genetic diversity;
- insurance against management failures in fished areas.

Internationally, many marine scientists are calling for 20% of the oceans to be protected in marine reserves by 2020. Some advocate that as much as 50% needs to be protected to safeguard marine biodiversity from overfishing.

5. **Protection versus use - Restoring the balance**

To restore the balance between protection and use of the marine environment, ECO and Forest and Bird have identified key changes that need to be made to fisheries management.

Solutions

The key changes proposed include:

- Retaining government control and administration of fisheries management, research and enforcement;
- Introducing requirements for the environmental impact assessment of fishing;
- Ensuring fisheries are managed according to the precautionary principle so that:
 - a) depleted fish stocks are rebuilt through controls or area closures;
 - b) all fish stocks are managed to ensure populations do not fall significantly below unfished levels;
 - c) fishing is strictly limited or not permitted for fish stocks for which information on populations levels or fishing impacts is absent, seriously inadequate or indicates significant adverse effects;
- Ending fishing practices that cause significant adverse effects on the marine environment including an end to the use of set nets and bottom trawls;
- Reducing seabird and marine mammal deaths resulting from fishing to negligible levels approaching zero;
- Removing barriers to public participation and provide assistance to empower the public to take part in fisheries processes;
- Developing a system of representative marine reserves and other controls to avoid, or mitigate the effects of fishing on the marine environment.



The attached questionnaire provides the opportunity for you to provide feedback on the issues raised in this document.

Please complete and return your questionnaire by **16 November 2001**.

Further reading

Wallace, C et al (ed) (1998) *Seaviews: Marine Ecosystems Management Obligations and Opportunities, Proceedings of the conference held in Wellington, 11-14th of February 1998*, Environment and Conservation Organisations of New Zealand Wellington.

Office of the Auditor General (1999) *Information Requirements for the Sustainable Management of Fisheries*, Wellington.

Parliamentary Commissioner for the Environment (1999) *Setting Course for a Sustainable Future: The Management of New Zealand's Marine Environment*, Wellington. A summary of the report is available online at www.pce.govt.nz