



Ministry of

**Fisheries**

Te Tautiaki i nga tini a Tangaroa

# The State of Our Fisheries

Annual Summary 2006



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The marine environment features high in New Zealander's minds. Our waters support many valuable fisheries and are home to many special creatures. However, getting the most from our marine resources requires an ongoing balancing act.

We must balance what we take now against what we leave for the future. We must balance the economic benefits of catching fish against any environmental damage this may cause. We must also balance how catches are shared between our commercial and non-commercial fishing sectors.

The *State of Our Fisheries* reports on the management of New Zealand's fisheries now, and into the future.

To date, our fisheries management has largely focused on commercial species, and making sure sustainable catch limits have been set. The Quota Management System has solved one issue that many other nations still struggle with – the problem of too many boats and fishermen for the resource to cope with. But we can do better.

Concerns over the environmental effects of fishing have increased in recent years. And as a result, the government has developed more structured approaches to balancing protection and use of our marine resources. These involve everyone in the process – the fishing industry, environmental groups, tangata whenua, marine scientists, communities, and the wider public.

Involving people is important, because much of what we must do relates to people's values, behaviours and expectations.

Species like snapper, kahawai, paua, pipi and rock lobster are hugely valuable to customary fishers, and are part of our recreational fishing heritage. Many of these also bring valuable export returns to our commercial sector.

How do we share such resources so that we all get the best value from them? Again, we must involve everyone in the process.

As the collective owners of our marine resources, I urge all New Zealanders to become more involved in their management. Take up the opportunities for input and submission into government processes this year. And together we can shape what gets passed on to the next generation.

A handwritten signature in black ink, appearing to read 'J Anderton'.

Hon. Jim Anderton  
*Minister of Fisheries*  
May 2006

Together we can shape  
what gets **passed on to**  
the next generation.

# Introduction

“Fishing is the chief business in this part of the country,” wrote Joseph Banks when he visited Northland on *HMS Endeavour* in 1769. Two hundred and thirty years later, fishing is still big business for New Zealand.

Last year, about 600,000 tonnes of fish was sustainably harvested from our seas. Much of this came from productive commercial fisheries on the Chatham Rise and in the Subantarctic. Here, vessels process fish in factories at sea for markets in Europe, Asia, Australia and the United States.

Fishing is also part of our heritage.

The fact that we can go down to the coast from any of our cities and towns, and catch a feed of fish or shellfish is something very special. It is part of what it means to be a New Zealander.

New Zealand’s inshore fisheries reached crisis-point in the late 1970s. Government subsidies and high export prices had attracted more and more fishers with better boats and gear. This, and some ineffective management, led to species like snapper, scallop and rock lobster being over-fished. Everyone believed a new system was needed.

Also, New Zealand had declared an Exclusive Economic Zone out to 200 nautical miles and needed to rationally develop these offshore fisheries.

So in 1986, after extensive talks with fishers, the government brought in the Quota Management System. This controls commercial fishing and has led our inshore fisheries to recover. It also improves the value New Zealand gets from commercial fisheries.

The system gives security to fishing companies. Because they know what their share of the coming year’s catch will be, they can plan ahead. This encourages them to invest in equipment and staff to sustainably harvest, process and market the catch.

But what about the Treaty of Waitangi? In this, Māori were guaranteed “undisturbed access” to their fisheries. The courts found there was a major glitch. The way the quota system worked meant that Māori had no access to commercial fisheries, unless they owned fishing quota – which mostly they didn’t.

A solution was agreed to. The government would return 20 percent of commercial fishing quota to Māori. The government also agreed that iwi and hapū could continue to manage their non-commercial customary fisheries and traditional fishing grounds.

In the years since, Māori have built their commercial stake to a point where they now control or influence over 30 percent of our commercial fisheries.

Now the government has begun to look again at our important inshore fisheries. In some of these, there are simply not enough fish to meet everyone’s expectations.

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We have a growing population, which means more pressure on this valuable resource. Recreational fishing has become increasingly important in some regions. The role of tangata whenua in managing fisheries has increased. And we see changes in the commercial market values for some species.

In popular fisheries, where demand outpaces supply, the government must decide how to share the fish between our non-commercial and commercial fishers. Where does the best value for the country lie? This is a public policy issue the Ministry of Fisheries is working to resolve.

The oceans and their ecosystems are hugely complex. New Zealand's marine environment covers some 4.4 million square kilometres of ocean, and we struggle to understand a tiny fraction of this.

Poor knowledge of the oceans' natural systems and their creatures makes managing fisheries a difficult job. It is easy to get it wrong. And sometimes we do. So the government is cautious whenever it sets catch limits for fisheries.

But sharing and controlling fish catches, and maintaining breeding stocks in our fisheries are not the only management we need. Fishing can also disturb sea bed habitats and marine ecosystems, and can harm other species like marine mammals and seabirds.

The government is working with tangata whenua, scientists, environmental interests, and fishing companies to make sure these effects stay within acceptable levels.

The management of fisheries outside New Zealand waters is also important.

When New Zealand's 200 nautical-mile Exclusive Economic Zone (EEZ) was established in 1977, our fishing industry was largely an inshore affair. Since then, the industry has developed fishing opportunities throughout our EEZ and beyond, including international waters. Today, the government works to protect New Zealand interests in a number of fisheries outside of our EEZ. These include fisheries in the southern ocean, Antarctic, the Tasman Sea, and the Pacific Ocean.

As seafood exports are a valuable foreign exchange earner, the government also works to make sure our exporters get a fair deal in world markets.

	00/01	01/02	02/03	03/04	04/05	05/06*
Stock Assessment	46	40	54	53	56	57
Aquatic Environment and Biodiversity	16	18	21	11	14	17
Recreational/Non-Commercial	10	7	5	5	7	11
Socio-Economic	4	5	1	2	4	2
Customary	6	4	0	2	0	7
Other Research	22	29	21	22	24	18
<b>Total</b>	<b>104</b>	<b>103</b>	<b>102</b>	<b>95</b>	<b>105</b>	<b>112</b>

> Number of Ministry of Fisheries' projects by research area

\* provisional estimate

# Fisheries and Their Ecosystems



## Incredible marine habitats and ecosystems

New Zealand's 200 nautical mile Exclusive Economic Zone (EEZ) covers around 4.4 million square kilometres, and is the fourth largest in the world.

Within this lies a rich and complex seascape with a great variety of marine habitats and life forms. There are undersea plateaus and mountain ranges, volcanoes, coastal estuaries and the 10,000-metre deep Kermadec Trench – the second deepest point on Earth.

Over 15,000 marine species have already been found living in these seas. And scientists think that another 50,000 may yet be found here. This could represent about 10 percent of the world's known marine species.

Also, our isolation in the south-west Pacific means that there are many species unique to New Zealand.

Many migratory species also visit our waters. In fact, some marine mammal and seabird species depend on New Zealand breeding areas and feeding grounds for their existence.

## Oceans and productivity

The most productive areas of the world's oceans are where cold, nutrient-rich waters mix with warm surface waters. This occurs on a huge scale off Chile, Peru and Argentina. By comparison, only a small amount of New Zealand's offshore waters are highly productive.

New Zealand's ocean productivity results from a combination of its location in the Pacific, its undersea landscape, ocean currents, and climate.

Warm subtropical surface waters bathe the North Island and the west coast of the South Island. Much colder subantarctic surface waters surround the rest of the South Island and offshore islands to the south and east. These warm and cold waters meet to create the Subtropical Front, an ocean feature that circles the Southern Hemisphere.

Here, nutrient rich waters from the south mix with the warmer northern waters. These create ideal conditions for plankton and the animals that feed on them. This is good news for our fisheries. On the Chatham Rise and in the subantarctic, the undersea landscape and currents enhance these conditions.

## A network of marine protection

The government is setting up a network of Marine Protected Areas (MPAs) to protect examples of our different marine habitats and ecosystems, as well as those that are outstanding or rare. Like our land-based Protected Natural Areas network, this will make sure some of our biological wealth in the seas is 'banked' as an investment for future generations.

Some areas are already protected by marine reserves, Fisheries Act closures, and cable protection zones. These have each been set up to achieve slightly different things, and so are not integrated in any structured way.

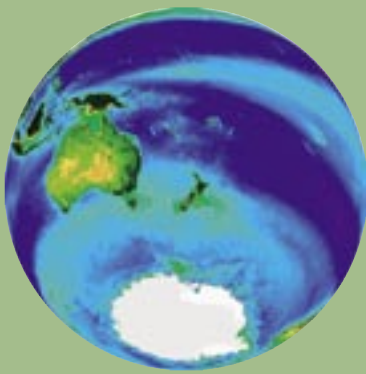
The MPA process will make sure that future marine protection is properly planned and integrated. We will decide what areas need protecting in our coastal waters (out to 12 nautical miles) on a region-by-region basis, and make decisions about protection in our EEZ at a national level.

The process is being run jointly by the Ministry of Fisheries and the Department of Conservation, and will involve other government departments, local government, marine users, tangata whenua, and groups with an interest in the marine environment.

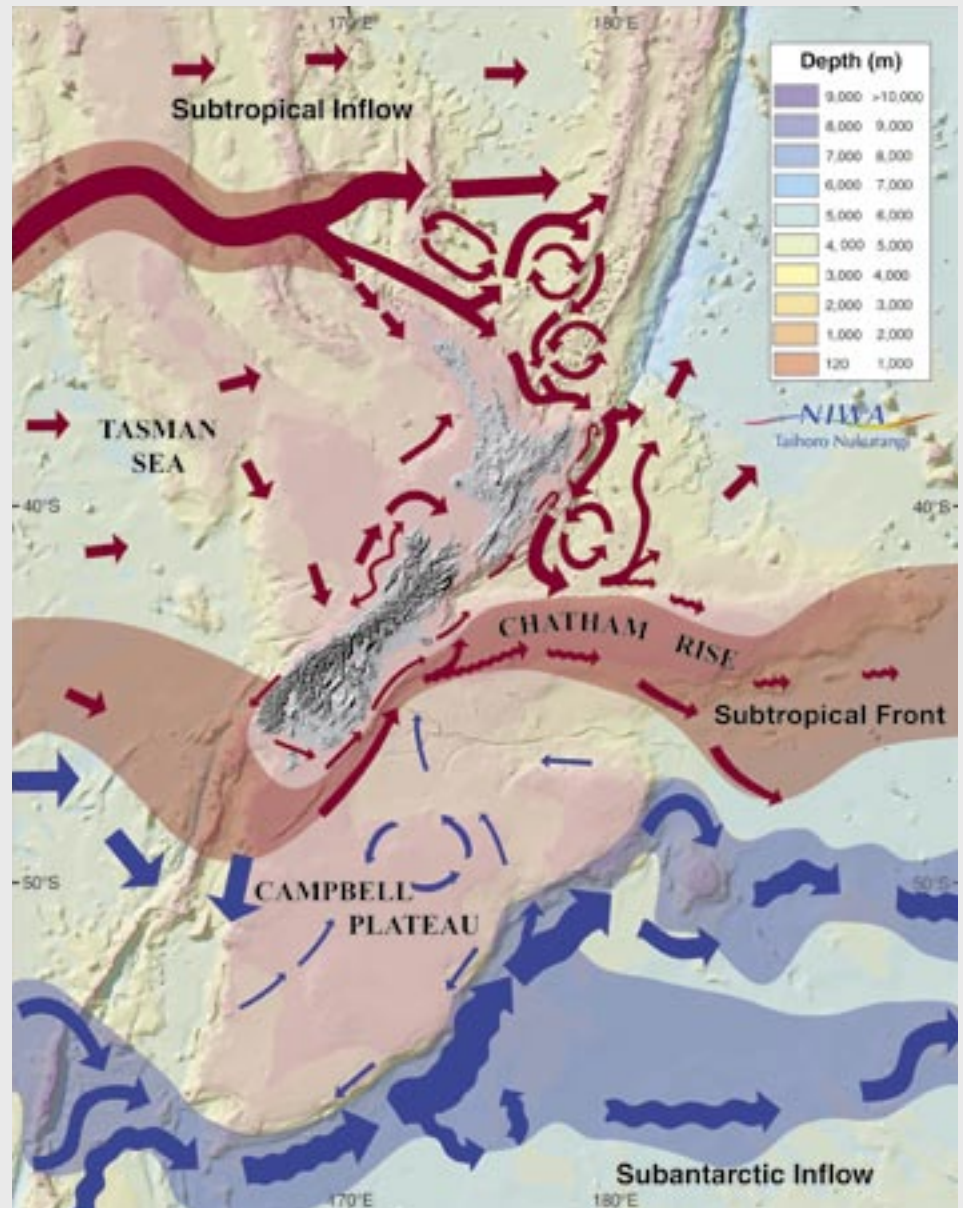


## Fisheries and their Ecosystems

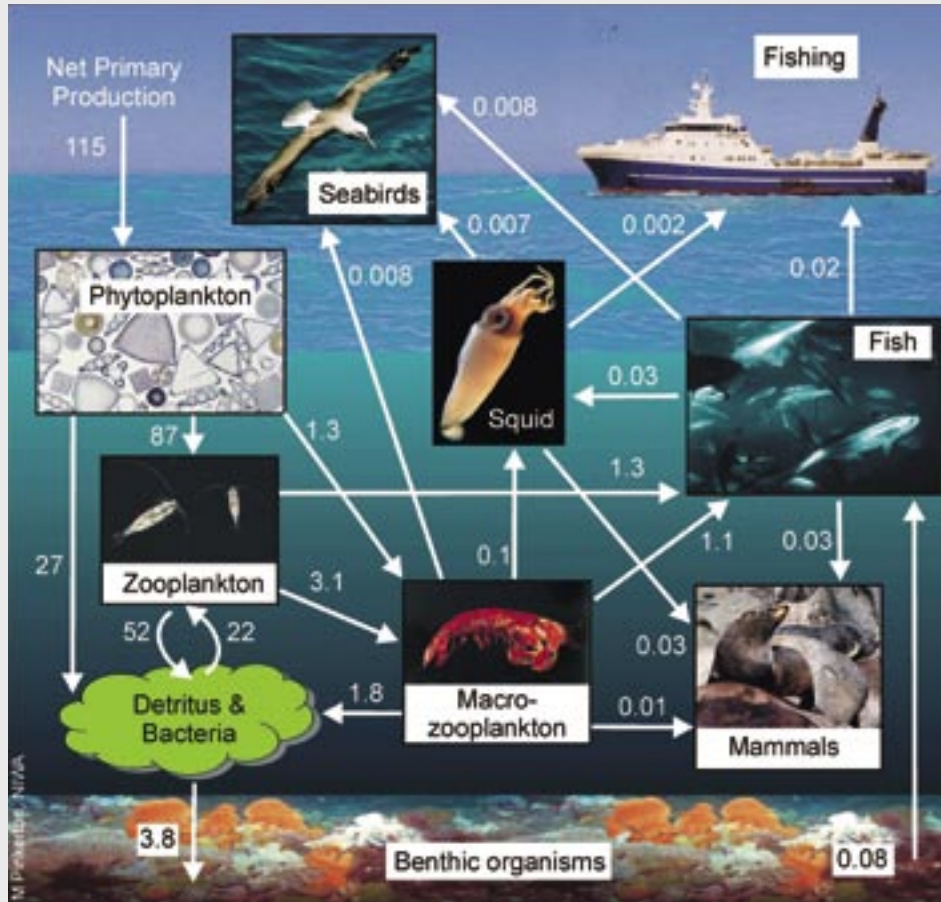
- > The Subtropical Front is created by nutrient rich subantarctic waters mixing with warmer surface waters. This creates ideal conditions for plankton and the animals that feed on them.



- > Surface concentration of phytoplankton in Autumn. Highly productive waters appear green; less productive waters appear blue. Image is based on data from the ocean colour satellite sensor SeaWiFS, courtesy of NASA and Orbimage.







> This simplified food web for the subantarctic area of New Zealand shows the estimated transfer of energy between the different parts of it.

## ‘Flow-on’ effects in fisheries

The traditional way to manage fisheries is to focus on a single species - working out how much can be caught each year without affecting the breeding population and causing irreversible harm to the species.

However, taking any fish affects other marine life – the species that eat that fish, and species that are eaten by them. The government is now starting to look at these ‘flow-on’ effects, and how important they might be when managing fisheries.

The Chatham Rise is our most productive and important fishing ground, and the Ministry of Fisheries has begun a three-year study there to learn more about the flow-on effects of fishing.

Scientists from NIWA are working their way through more than 40,000 fish stomachs, to learn about the diets of different species across the Chatham Rise.

When we combine this study with similar diet studies for sea mammals and birds, and with other climate and ocean studies, we will have a better picture of how different parts of the Chatham Rise ecosystem fit together.

This will help us predict the effects our catches are having on other species, including seabirds and marine mammals.

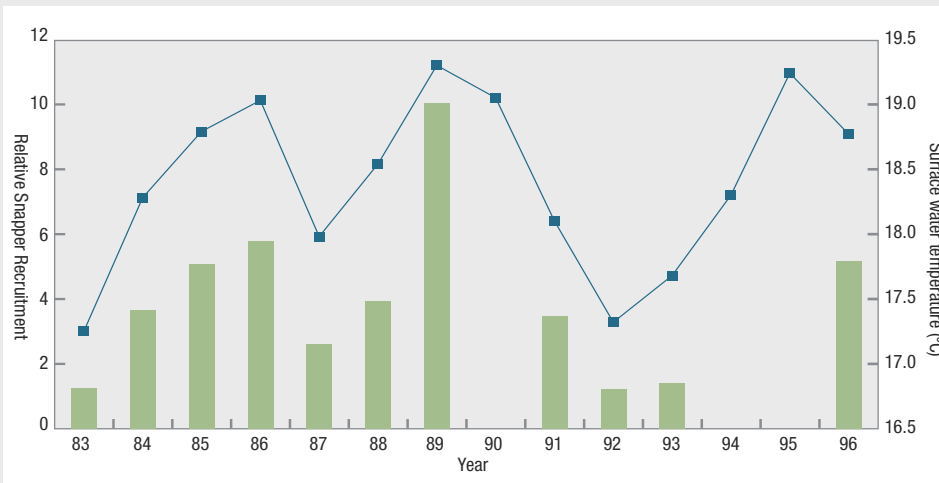
## Fisheries and their Ecosystems

The Chatham Rise and subantarctic fishing grounds provide 60 percent of New Zealand's fish catch. Most of this comes from areas near the Subtropical Front. This includes the main hoki, hake, ling, silver warehou, squid and orange roughy and deep sea (oreo) dory fisheries.

New Zealand's west coast (mostly off the South Island) provides around 30 percent of our fish catch. Much of this occurs when fish gather there to spawn in winter and spring (eg hake, hoki, ling, silver warehou).

Westerly winds affect our ocean currents and the temperatures of surface waters. These vary between seasons and between years, and so affect the patterns of upwelling and nutrient mixing in our seas. This in turn affects how much food is available and how many fish are produced.

Longer term weather cycles like El Niño and La Niña not only affect New Zealand's farmers; they also affect our fisheries.



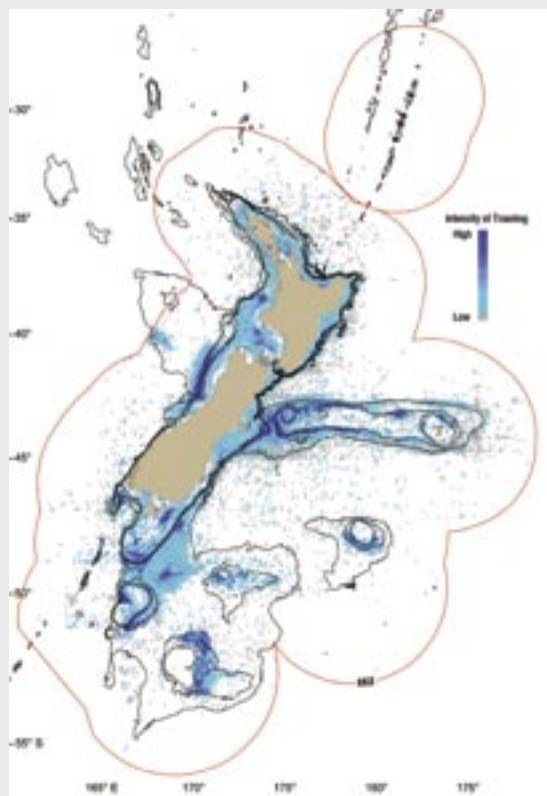
- Chart showing snapper recruitment against surface water temperature in the Hauraki Gulf. More baby snapper are produced when water temperatures are higher.

Scientists have found links between these weather patterns and fish abundance in a number of important fisheries. These include snapper, scallop, red cod, hoki, and rock lobster.

La Niña years favour the production of young snapper and scallops in the Hauraki Gulf and Coromandel.

Some climate scientists think New Zealand is coming into a time of more frequent La Niña years. This could be good news for our northern snapper fisheries, but it might not be so good for some other species, like hoki (where more young fish seem to be produced in El Niño years).

Learning more about the natural cycles that affect fish abundance will help us predict good years and bad years for fisheries. This would help in their management, and could help fishing companies in planning ahead.



> Trawling on or near the sea floor during the 1990s.

## Impacts of bottom fishing

About 35 percent of our EEZ lies in trawlable depths (0–1500 metres). Much of the shallower parts have been fished at some point, and some depths and certain fishing grounds are fished often. In places like these, the sea floor today will likely be different to what it once was.

One heavily modified stretch of sea floor is Foveaux Strait, where oyster boats have dragged their dredges for over a century. The plant and animal communities that develop on the sea floor there are those that can survive this sort of regular disturbance.

In shallow waters, some types of sea floor communities can recover quite quickly from the effects of dredging or trawling. However, fragile deepwater habitats may take hundreds of years to recover from such effects.

The government has already closed a number of areas to bottom fishing. Other areas of our sea floor may also need protection. So the Ministry of Fisheries and Department of Conservation are working together to learn more about the effects of bottom fishing on a range of sea floor communities.

### SMEEF

Using resources wisely is a delicate balancing act. It means meeting today's needs without compromising those of tomorrow. We want to leave future generations with at least as many options for using marine resources as we ourselves enjoy.

The catches in most of our major fisheries are set close to the maximum sustainable level. But we know it is not enough to just manage catches sustainably. We must also consider the effects fishing has on the wider environment – fish and other creatures caught or killed during fishing, habitat damage, and the flow-on effects of all these things on marine ecosystems.

To manage fishing's 'footprint' on other species, and on our marine habitats and ecosystems, we must set limits around what level of effect is acceptable, and what is not.

In 2005, the Ministry of Fisheries set out a Strategy for Managing the Environmental Effects of Fishing (SMEEF), which describes how such limits will be set.

Three key factors will be considered when setting environmental limits:

- > weighing up whether effects on species or habitats are sustainable in the long-term
- > what society feels is the right balance between use and protection
- > what the needs of future generations might be.

### Keeping within environmental limits

Children born in 2006 will be starting to plan for their future by 2020. What kind of world will they inherit?

Globally, the omens do not look good. Everywhere, there are signs of the environment's limits being stretched. The global fish catch has now reached the limits of ocean productivity. At the same time, some marine ecosystems and habitats are damaged or destroyed by fishing and pollution.

Our oceans and their ecosystems are hugely complex, and we struggle to understand a tiny fraction of them. So it is understandable for the government to be cautious when it sets catch limits for fisheries. Caution is also needed when dealing with the effects of fishing on threatened seabirds and marine mammals, or on habitats and ecosystems.

To get better at managing such things, we must learn more about the marine life in our seas. We need to know more about how these ecosystems function, and also what effects fishing, pollution from the land, or changes in ocean and weather patterns have on them.

When setting limits around the effects of fishing, three questions are asked: Can the environment handle the effects? What does society think about the effects? And what are we leaving for future generations?

To answer the first question, the Ministry of Fisheries' science group draws mainly on the work of scientists from research agencies like the National Institute for Water and Atmospheric Research (NIWA). Answering the other questions involves a wider range of people, including government agencies like the Department of Conservation, tangata whenua, environmental interest groups, recreational fishers, and fishing companies. Together, we are making progress in many areas.



The government and industry are working to reduce seabird deaths in our fisheries. As a result, we have seen huge drops in seabird deaths in the joint-venture tuna and ling auto-line fisheries. We expect to soon see a drop in seabird deaths in our squid and hoki fisheries, as a result of recent government/industry initiatives to keep seabirds away from the sterns of trawlers, where their trawl warps enter the water.

Recent laws have also closed parts of the North Island's west coast to set netting, in places where the endangered Maui's dolphin is found. The government is now working to stop deaths of its South Island relative – Hector's dolphin – in fisheries there.

Recently there has been growing concern about the effects of bottom fishing on seafloor habitats. Fragile bryozoan beds on the sea floor in Tasman Bay and Spirits Bay have already been closed to bottom fishing, as have 19 deep-water seamounts. The government is now looking at the effects of bottom fishing on other habitat types.

Many other types of human activities can potentially damage the marine environment. One of the greatest threats to near-shore fisheries is runoff from the land. This includes sediment and nutrients being carried down rivers from farmland, forestry and other land development. In some coastal areas, these effects may be greater than the effects of fishing.

Another potential threat to our marine environment is the introduction and spread of marine pests, like the seaweed undaria and the clubbed tunicate sea squirt.

## Threats from the land

**Soil and nutrient run-off from the land can have huge effects on our coastal ecosystems.**

Recent research, done by NIWA for the Ministry of Fisheries, shows that with more sediment in the water, fewer baby paua and kina survive. It also shows that sediment affects the tiny animals living on kelp. As these are a major food supply for other rocky reef species, it seems that high sediment levels will reduce the productivity of whole rocky reef ecosystems, and affect catches of important recreational, customary, and commercial species.

Future studies will look at the effects high nutrient levels are having on the marine environment. One of these will be done this year in Southland and will examine the effects of runoff from agriculture and intensive dairy operations on coastal ecosystems.



# Māori Fisheries



## Background

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Fisheries have always been important to iwi and hapū.

Seafoods were traded widely among tribal groups and, later, with European settlers in New Zealand. And being able to feed their guests seafood shows the host's mana at important events on the marae.

The fishing gear used by Māori impressed James Cook and other early Europeans. When the Treaty of Waitangi was signed in 1840, Māori were already trading seafood products into Australian markets.

Fishing's importance was recognised by the Treaty of Waitangi. The English version guaranteed Māori "undisturbed possession" of their fisheries until they wished to dispose of them to the Crown. This idea of Māori fisheries rights was later brought into New Zealand law.

In 1986, the government set up a new way for managing commercial fishing. The system created tradable quota shares in the commercial fishery. Suddenly, Māori no longer had special rights that guaranteed "undisturbed possession" of their fisheries.

This kicked off the largest indigenous rights claim in New Zealand's history.

## The Fisheries Settlement

After much debate, the government and Māori both agreed the new system was best for New Zealand's commercial fisheries. However, they spent some time in court before they could agree on how to settle this loss of Māori fisheries rights.

The settlement was split into two parts: commercial and non-commercial.

The commercial part was done in two stages. In 1989, the government bought back 10 percent of the quota shares it had given to fishers and gave this to the Treaty of Waitangi Fisheries Commission, for the benefits of Māori. In 1992, the government gave Māori a cash settlement that was used to buy half of New Zealand's biggest fishing company – Sealord. The government also gave Māori 20 percent of the commercial quota shares of any new species brought into the system.

The non-commercial part was settled in 1998 by the 'customary fishing regulations'. These laws recognise the control tangata whenua, or 'people of the land', traditionally had over fishing culture and some of their fishing areas.

As well as this, when the government sets catch limits for fisheries each year, it must now allow for Māori customary use (eg hui, blessings, tangi).

## Restoring Rapaki Bay fisheries

Rapaki Mātaitai Reserve in Lyttleton Harbour is a traditional fishing ground for the people of Te Hapū o Ngati Wheke Runanga.

The reserve covers the whole of Rapaki Bay, an area that has shown poorer and poorer seafood catches over the years. This has been blamed on overfishing, sewage, and road and pasture runoff into the harbour.

The reserve's guardians (Tangata Tiaki) are working with government agencies and the local community to help improve the state of these fishing grounds.

Included in this are new regulations to control fishing in the reserve. The guardians have stopped all customary and commercial fishing in the area, and are now monitoring the catches of recreational fishers.

Any recreational fisher in the reserve must now report their catch to the Tangata Tiaki, telling them how many fish were caught and when.

The guardians are working with the local community to reduce pollution from septic tank leakage, road and pasture runoff, and stock effluent. Great results have been achieved to date: the area's sewage is now piped to Lyttleton, some pasture has been retired, forest remnants are being fenced, and stream banks planted.

The reserve's guardians believe that pollution from sewerage outfalls in Lyttleton Harbour is having a huge affect on the health of sealife in the reserve. They are working with local councils to reduce this, as well as on ways to reduce the impacts of boating on Rapaki Bay.



## Taking up the customary regulations

To date, some 39 iwi and hapū groups have been officially recognised as having tangata whenua status over defined fisheries areas (rohe moana). Within these, some 278 individuals and groups of guardians (Tangata Kaitiaki / Tangata Tiaki) have been appointed.

The Ministry of Fisheries has been working with iwi and hapū to make them aware of the customary fishing regulations. The first step in this is for iwi and hapū groups to work out who has tangata whenua status over a fishery.

The customary regulations have already been adopted across much of the South Island. Ngai Tahu was one of the first iwi to see the opportunities open to Māori under the customary regulations, and quickly took advantage of these.

However, there are more iwi and hapū in the North Island, so it is taking longer to agree on defined boundaries between different hapū.

## Managing customary fisheries and traditional fishing grounds

The customary fishing regulations return some of the mana for fisheries management to tangata whenua.

They let iwi and hapū manage their non-commercial fishing in a way that best fits their local practices. But they do not have a major effect on the fishing rights of others.

To use the customary fishing regulations, iwi and hapū groups must decide who has tangata whenua status over a fishery. This can be shared by a number of groups. Groups choose people to act as guardians for the area (Tangata Kaitiaki in the North and Chatham Islands, Tangata Tiaki in the South and Stewart Islands). The guardians are then appointed by the Minister of Fisheries.

Guardians can issue anyone a permit to catch fish in their area for customary use. They must report these catches to the Ministry of Fisheries so the government can allow for customary use when it sets next year's catch limits.

Tangata whenua can ask for special management areas – 'mātaitai reserves' and 'taiapure-local fisheries' – to cover some of their traditional fishing grounds. Within mātaitai reserves, guardians can bring in changes to the rules for customary and recreational fishing. They can also say whether some types of commercial fishing should continue in the reserve.

Without the customary fishing regulations, iwi and hapū can only take fish for important events through the Amateur Fishing Regulations. This lets marae honour guests by providing seafood at events like hui and blessings. But it gives no more control over their fisheries than this.

The Ministry of Fisheries has been working with iwi and hapū to make them aware of the customary fishing regulations, and get them more involved in fisheries management in their areas.

By February 2006, 39 iwi and hapū groups had confirmed their tangata whenua status over their fisheries. Within these, 278 guardians (or groups of guardians) had been appointed. Six of these groups have gone on to create mātaitai reserves over their traditional fishing grounds. These include the Maitai River Mātaitai Reserve – our first freshwater mātaitai.

## The Māori Commercial Aquaculture Settlement

Recently the government made changes to the way marine farming (aquaculture) is planned for and managed around New Zealand's coast.

The Waitangi Tribunal found these changes would breach principles of the Treaty of Waitangi, as it found "Māori have an interest in marine farming that forms part of the bundle of Māori rights in the coastal marine area". This created some uncertainty for marine farmers and council planners.

The government settled this uncertainty by providing iwi with the equivalent of 20 percent of marine farming water-space rights allocated on or after 21 September 1992. However, claims relating to marine farming space created before this will be addressed through the Treaty of Waitangi historical claims process.

This settlement was made after discussions with the Waitangi Tribunal claimants and the Treaty of Waitangi Fisheries Commission. The aquaculture settlement aimed to be consistent with the principles of the 1992 fisheries settlement.



## Closures build on rāhui

New Zealand fisheries legislation supports traditional rāhui through temporary closures and fishing method restrictions. Two examples of this include support of customary rāhui in the Firth of Thames, and in Pukerua Bay, just north of Wellington.

In late 2004, local runanga requested the temporary measures in these two areas be extended through 2006 to allow their respective fisheries to continue rebuilding. After considering the state of these fisheries, as well as public submissions, the Minister of Fisheries agreed and the temporary measures were extended for a further two years.

The Hauraki Māori Trust Board instigated the closure of the pipi and cockle fisheries between Wilson and Ngarimu Bays in the Firth of Thames over seven years ago, in response to declining stocks there.

Te Runanga o Toa Rangitira instigated temporary measures that restrict take to hand line fishing only in Pukerua Bay, for the same reasons.

While the decline of both these fisheries has been largely because of fishing pressure, it is thought that environmental conditions may also be playing a role in the case of Hauraki's pipi and cockle fisheries.

# Recreational Fisheries



## World class and growing

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New Zealand's recreational fisheries are world class. Within minutes of our major cities, people can go and gather a feed of shellfish, or catch rock lobster (crayfish), snapper or blue cod.

This is part of our New Zealand heritage.

But we have a growing population. As our towns and cities grow, more and more people take seafood from the seas nearby; and more and more go to holiday or live in popular seaside spots like the Marlborough Sounds, Coromandel or Bay of Plenty.

About a million people each year go recreational fishing in New Zealand, including many who dive or gather shellfish from our beaches. This effort tends to be concentrated in our popular weekend and holiday spots.

Photos taken in the 1950s and 60s sometimes show recreational fishers with huge catches of fish. Hauls like this, along with intense fishing by commercial boats in the 1960s and 70s, badly affected some inshore fisheries.

Most are now recovering. Commercial catches were reduced in the 1980s, and some recreational limits have been reduced more recently.

But improving the state of our important inshore fisheries remains a challenge for fisheries managers.

Recreational catches are managed by a range of rules. Some set out how many fish a person can take each day. Others set minimum size limits, or limit the fishing methods that can be used.

The rules help make sure there are enough fish to go around. They are made to be simple, and usually apply to a wide geographic area.

But with lots of people chasing fish in popular coastal areas, there can be shortages. This happens particularly with species that stay in the same area, like shellfish, rock lobster, and blue cod.

For instance, in the Tasman/Marlborough area, we know there are enough blue cod to breed and keep up the overall population. But in more popular parts of the Sounds, fishers may find it difficult to catch a legal-sized blue cod.

Fishing pressure can also affect the sustainability of some popular species on a broader scale. Where this happens, rules are changed to reduce the numbers of fish caught.

Snapper fisheries on Northland's west coast have been slowly rebuilding after intense commercial fishing in the 1970s. These are important fisheries for both recreational and commercial fishers, and the government wants them to rebuild faster. So it has recently reduced commercial catch limits in the area, and reduced recreational bag limits from 15 to 10 snapper per day.

## Giving fishers a voice

Recreational fishing covers a huge range of people: charter boat skippers, big game fishers, divers and spear-fishers, kids catching sprats to feed the cat, or people fishing for a feed off the beach or digging cockles from the sand.

Catching up with all these different interest groups has never been that straightforward. So the Ministry of Fisheries has set up a series of forums to help it discuss management issues with the wider fishing public.

"The seven regional forums are made up of people with good experience and understanding of the recreational fishing sector in their part of the country," says Senior Fisheries Management Advisor Arthur Hore. "They represent recreational groups and organisations in their area, and are passionate about their fisheries. They also have an appreciation of the issues involved in managing New Zealand's marine environment."

The new regional forums deal mainly with operational issues.

As well as the forums, the Minister of Fisheries meets regularly with an advisory group of recreational fishers. This group focuses more on strategic issues.

## Staying within the rules

Honorary fishery officers play a vital role in protecting our fisheries. They give up their time to patrol the beaches, checking to make sure everyone knows, and follows, fishing regulations. It can be a tiring job, but Auckland District Compliance Manager Matt Cowan says his 50 or so volunteers are motivated by a sincere love of the coastline.

“Many of them are older, and they do this on their own time because they want to help out.”

He says having these officers patrolling a beach can change it from a situation where many people are breaking the rules, to one where everyone is obeying them. This makes a huge difference on heavily populated beaches where there may be hundreds of people gathering shellfish.

“If everyone follows the rules, then there is enough for everyone. So it is really helpful to have an extra 50 sets of eyes and ears on the lookout.”

Mr Cowan says that education is a priority for honorary fishery officers, because often people are not aware of the rules, and the reasons they have been put in place.

## Sharing our fisheries

Deciding how to share New Zealand’s fisheries between the commercial and non-commercial sectors is something the government is grappling with, as it tries to ensure New Zealand gets the most value out of its fisheries.

But where does that best value lie - with the non-commercial fisher or the commercial sector?

The issue causes fierce debate, particularly in our snapper, blue cod, kingfish, kahawai, and rock lobster fisheries. These species are especially valued by recreational fishers.

The commercial sector sells fish to make money. Here, the value of fish is easily measured in export dollars and domestic sales.

However, non-commercial fishers value fisheries for a wider range of reasons. These include putting food on the table, the fun of fishing, and enjoying the outdoors. So measuring the value of fish to this sector is not so easy.

We know that both the commercial and non-commercial sectors contribute to the New Zealand economy. Commercial fishing creates jobs in catching, fish processing and marketing, as well as in marine engineering and fishing equipment industries.

We also know that many weekend and holiday communities in coastal areas depend on ‘good fishing’ to draw visitors. These visitors create jobs in the retail, service, and entertainment industries. Added to this are the jobs created from more general spending on fishing and diving gear, bait, boats, and fuel.

In shared fisheries, we need to know how much fish each sector is taking. While we have a good record of commercial catch, we know less about what recreational and customary fishers take each year.

This information is very important when we make decisions about how to share our fisheries.

The Ministry of Fisheries has commissioned a series of surveys that will tell us more about recreational fish catches in popular fishing areas – Northland, Hauraki Gulf, Bay of Plenty, and Tasman/Marlborough. This will help us to manage shared fisheries in these areas.

## Managing fish size and abundance

As well as deciding how much fish to give to different sectors, we also have to decide how large and abundant we want the fish to be.

Managing fisheries at the level of Maximum Sustainable Yield (MSY) lets commercial fishers catch the greatest amount of fish, year after year in a way that is sustainable.

However, recreational fishers often want to be able to catch big fish more easily. This may mean reducing catches to below the MSY level, so that more fish can grow larger.

So managing a fishery to best suit both recreational and commercial fishers is not always possible.



## A summer of snapper

A survey was recently done to estimate the recreational snapper and kahawai catches in the Hauraki Gulf. This was done by NIWA, using a mixture of spotter planes and boat ramp interviews to sample the recreational fishers and their catches over this period.

The Hauraki Gulf is a popular recreational fishery, accounting for around 35-40% of New Zealand's total recreational snapper catch.

Initial results suggest more than 840 tonnes of snapper and 20 tonnes of kahawai were harvested by recreational fishers in the Hauraki Gulf over the 2003/04 summer period. Final results of the survey will be available later in 2006.

Another survey, using the same method, is being used to estimate the recreational harvest of snapper, kahawai, kingfish and rock lobster over the whole of the area from North Cape to Cape Runaway for the 2004/05 summer.

A similar survey has begun in the Nelson/Marlborough region. Blue cod is a particularly popular fish there, with around 80 percent of the catch being taken by recreational fishers.



# Commercial Fisheries



## The Quota Management System

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Fishing is big business. In 2005, New Zealand companies caught and sold around 1.2 billion dollars worth of fish.

Much of the industry's success comes from how we manage our commercial fisheries.



To fish commercially in New Zealand you must have a fishing permit and access to someone's share in that fishery. These shares – or quota – can be bought or sold, entitling their owner to a share of the commercial catch.

Many other countries set annual catch limits for their commercial fisheries, but only a few countries split these into tradable shares.

Where there are limits, but no tradable shares, fishers are in a race to catch as much as they can before the limits are reached.

When fishers focus on quantity, not quality, their catch might not be stored or handled as well as it could be. So it may not be worth what it could be. Also, when fishers focus on quantity, fish often all the hit the market at the same time, again reducing prices.

Our system stops this race, and has improved the value New Zealand gets from its fisheries. Each quota owner knows how much fish they are entitled to at the start of each fishing year. So they can plan ahead.

Some owners simply sell off their entitlement each year to fishers and fishing companies. Others work to get more value from it by fishing and marketing the catch themselves, or getting someone else to do this for them.

Each year, the government sets a commercial catch limit for each quota species. The limit may vary from year to year, depending on the advice of fisheries managers and scientists. But quota owners have the security of knowing what their proportion of that catch limit will be.

This gives businesses the confidence to invest in costly vessels to process fish at sea, in onshore factories, in staff, and in global marketing. These investments have helped improve the value we get from our fisheries.

All commercial fishers must land their catch through a 'licensed fish receiver'. They must also report catch weights to the Ministry of Fisheries. The licensed fish receiver also reports the weight of the catch. That way the government can check catches are being reported honestly.

If fishers land a commercial catch without the catch entitlement to cover it, they pay a penalty. This helps stop over-fishing.

When a new species comes into the quota system, its catch limit is set. The government then decides how to share the catch between commercial and non-commercial fishers. Quota shares in the commercial fishery may be divided amongst fishers or companies who have been involved in the fishery. Or they may be sold through an open tender.

The government charges all quota owners their share of the costs of fisheries management. This includes researching and monitoring fish stocks and the environmental effects of fishing, and law enforcement.

## Buy hoki

**Hoki is one of New Zealand's largest seafood exports.**

This industry developed around fishing large schools of hoki that gather to spawn in Cook Strait and off the South Island's west coast each winter. Fishing now also occurs outside the spawning season on the Chatham Rise and in southern waters.

Initially, hoki was a low-value fish that was harvested in bulk and processed into surimi (the product that crab sticks are made of). This is because hoki flesh deteriorates rapidly once it is caught.

However, food scientists found that rapidly chilling the fish to 3°C when it is brought on board stopped this, and allowed quality frozen fillets to be produced.

These frozen-at-sea hoki fillets and fillet-blocks are now the cornerstone of New Zealand's hoki fishery.

Companies that own hoki quota have guaranteed access to their share of this catch. Such certainty means they view things long-term and plan ahead a lot more than can happen in other countries. This has led to ongoing company investment in staff, equipment, and collaborative marketing initiatives like the fishery's Marine Stewardship Council certification.

This 'ecolabel' helps secure New Zealand hoki exporters access to high-value, environmentally-aware markets in Europe.

## Our precious paua

Each year commercial divers collect about 1100 tonnes of paua, with an estimated value of over \$50 million. Unfortunately, poachers steal a huge amount of paua each year, threatening not only the commercial industry, but our whole paua resource.

The Ministry of Fisheries is working together with the paua industry on a coordinated approach to minimise the damage poachers do to our paua stocks. By working together, we can make sure these valuable fisheries are maintained for future generations.

Some of the stolen paua ends up in restaurants inside New Zealand, but most gets smuggled to overseas markets like Hong Kong and Taiwan, where it can fetch prices of up to \$100 a kilogram.

## An industry grows

New Zealand set up its 200-nautical-mile Exclusive Economic Zone (EEZ) in 1977.

At that time, our fishing industry was largely an inshore affair. Offshore waters, beyond our 12 nautical mile Territorial Sea, were fished by Japanese, Taiwanese, Korean, and Soviet vessels. But the new EEZ meant these vessels had to make arrangements with New Zealand if they wanted to keep fishing here.

Some New Zealand fishing companies saw opportunities in this, and made arrangements with foreign fishing companies. At the time, these foreign companies were the only people who owned the big vessels needed to fish offshore.

When the quota system came in, New Zealanders who had arrangements with foreign companies soon found they owned a big share of the offshore fishery. Many went on to invest in the vessels to fish this catch and onshore factories to process it.

Today, many New Zealand companies still use foreign vessels to catch their quota in our offshore waters.

New Zealand's inshore fisheries reached crisis-point in the late 1970's. Government subsidies and high export prices had attracted more and more fishers with better boats and gear. This, and some ineffective management, led to species like snapper, scallop and rock lobster being over-fished. Fishers were worried; as was the government. So the Quota Management System was brought in.

The first species came into the quota system in 1986. We now have 92 species in the system, with more to be added in October 2006.

As most of our fish is exported, New Zealand fishing has changed in response to global markets. The export values of paua and hoki have increased over the past two decades, while other fisheries, like snapper, have decreased in export value over time.

Today our most valuable commercial fisheries are: squid, hoki, orange roughy, and ling (offshore); and rock lobster and paua (inshore).

New Zealand companies also have fishing interests outside our economic zone. These include the waters just beyond our EEZ, as well as the southern ocean and Antarctic, the Central and Western Pacific Ocean, Indian Ocean and the Southern Atlantic Ocean.

## Who else gets the catch?

Quota shares give their owners confidence that no other commercial fisher is going to catch 'their' share of the fish.

However, theft is a concern. In some inshore fisheries, people catch fish and sell it illegally in New Zealand and overseas. Once stolen, this fish is not there for legitimate commercial or non-commercial fishers to catch. This is a particular problem in high value fisheries like rock lobster and paua.

The Ministry of Fisheries is working with quota owners and others to reduce fish theft.

Another issue is that, in some important inshore fisheries, there are simply not enough fish for everybody. Where this happens, the government must decide how the fish should be shared between the commercial and non-commercial sectors.

## The next step in management

The government is working on management plans for a number of New Zealand fisheries. These 'fisheries plans' will help the different sectors get the most from their fisheries.

For the commercial sector, this may mean things that make harvesting or managing the fishery more efficient. Or it might mean things that improve the value of their quota.

Species	*Weight (000 tonnes)	*Value (\$NZ millions)
Squid	70.9	168
Hoki	42.8	152
Rock Lobster	2.4	114
Orange Roughy	5.0	70
Paua	0.7	51
Ling	8.1	47
Hake	5.8	32
Jack Mackerel	30.3	31
Snapper	4.1	26
Warehou (all)	8.2	23

> New Zealand Fishing Exports 2005 (top 10 species)

\*2005 provisional figures

## A seafood icon

New Zealand's 'Bluff' oyster has been fished commercially in Foveaux Strait for well over a hundred years.

In the mid-1980s, we began to tackle the issue of Bonamia. This parasite was killing oysters, and caused the fishery to close midway through the 1986 fishing season. Fishing began again the next year, but the oyster beds most affected by Bonamia stayed closed, in case fishing worsened the problem. However, they found Bonamia spread anyway.

Next, they tried to limit the spread of infection by selectively dredging the central part of Foveaux Strait. This too failed, and the infection continued to spread. By 1993, the fishery was closed completely for three years.

The infection ran its course, and Bonamia disappeared for the rest of the 1990s, but reappeared as a new outbreak in 2000.

Managing Bonamia will be a great step forward for this fishery. So too will figuring out how to get more small oysters surviving through to market size. And also, we need to better understand the environmental impact of using dredges in Foveaux Strait.

Towards this, the Ministry of Fisheries is bringing everyone together to help develop a fisheries plan for the Foveaux Strait oyster fishery. The plan's development involves commercial, recreational and customary fishing representatives, scientists who have worked for years on oysters, environmental groups, fishery officers, and managers.

With everyone working together like this, we think that real improvements are possible.

# International Fisheries



## Government intent

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The government works to make sure 'high seas' fisheries around the world are managed in a sustainable way.

It particularly wants to make sure that fisheries New Zealanders are involved in are managed effectively, and that New Zealanders follow the rules wherever they fish on the high seas.

Much of New Zealand's seafood industry depends on exports. So the government works to reduce or wipe out unfair practices like trade restrictions and subsidies on seafood products in global markets.

## Fishing on the high seas

Outside of New Zealand's 200-nautical-mile Exclusive Economic Zone (EEZ) is the high seas. There, vessels must fly the flag of a country they are registered to. The only laws that apply are those of the vessel's 'flag state', and any international obligations that country has signed up to.

High seas fisheries and highly migratory fish, like tuna, that swim throughout EEZs and on the high seas are managed through agreements that set up Regional Fisheries Management Organisations (RFMOs).

It is best to include all the countries involved in the fishery in the agreement, because anyone not signed up will not be bound by the RFMO's rules.

Sometimes companies change their vessel's flag state to a country not signed up to a particular RFMO. This means they don't have to obey the rules of that high seas fishery. Such unregulated fishing makes it hard for people trying to manage high seas fisheries, because it means they can only control and get information from some of the fishers.

We can all do better in managing the world's high seas fisheries. Towards this, New Zealand is part of an international task force to tackle Illegal, Unreported, and Unregulated (IUU) fishing. This involves government ministers from Britain, Australia, Chile, Canada, Namibia and New Zealand.

New Zealand works to  
**improve management** of high seas fisheries.

## South Pacific Regional Fisheries Management Organisation

New Zealand is involved in negotiating an agreement to manage those South Pacific fisheries not already covered by other international agreements. These will include jack mackerel and orange roughy fisheries beyond our EEZ.

The agreement will create a new Regional Fisheries Management Organisation (RFMO) in the South Pacific. It may take around four years to establish - a comparatively short time in international negotiations. In the meantime, countries hope to bring in interim measures to protect the fish stocks and marine ecosystems while the negotiations continue.

The new RFMO will likely cover the most eastern part of the South Indian Ocean through the Pacific Ocean towards the EEZs of South American countries.

Once the organisation is set up, countries that sign the agreement are expected to adopt conservation and management measures for the relevant fisheries. These include measures to protect associated ecosystems. This could include catch limits, gathering data, gear restrictions, and other possible measures such as area closures in high seas waters covered by the agreement. Countries must then make sure their vessels obey these measures.

We also work to improve high seas management through international bodies like the United Nations' Food and Agriculture Organization, and through RFMOs. These include the Western and Central Pacific Fisheries Commission, the Commission for the Conservation of Southern Bluefin Tuna, and the Commission for the Conservation of Antarctic Marine Living Resources.

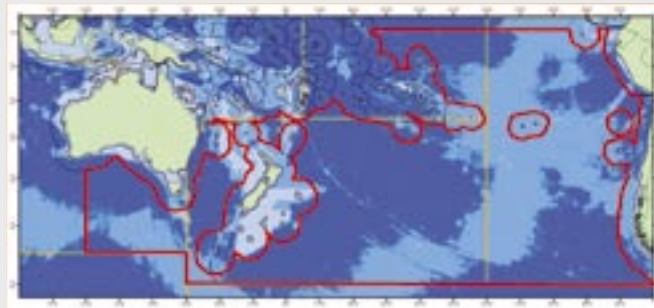
New Zealand works to negotiate new regional agreements in fisheries we are involved in. One of these has been negotiated recently for the Southern Indian Ocean, where our companies are involved in the orange roughy fishery. The government wants these interests protected, and the fisheries there well managed. The Southern Indian Ocean RFMO should be created in 2006.

Another new agreement in the early stages of negotiation will cover high seas areas of the Tasman Sea and South Pacific Ocean. When finished, this will create a South Pacific RFMO.

Fish do not respect lines on a map, and we know that some species like tuna, sharks and swordfish move all over the Pacific. This includes New Zealand waters, where we have important commercial and recreational fisheries for these species. Catches in other parts of the Pacific can affect what we catch here. So it is important, as a member of the Western and Central Pacific Fisheries Commission, that we are involved in negotiations on how these resources are managed and shared amongst all the people and nations involved in the fisheries.

New Zealand also works closely with its Pacific Island neighbours, towards developing and managing their fisheries in a sustainable way.

It is important to our integrity as a fishing nation that our companies and vessels follow international rules and agreements we have signed up to. So New Zealand controls the activities of our fishing companies and citizens on the high seas.



- > Proposed boundaries for the new South Pacific Regional Fisheries Management Organisation



## Market access

Around 90 percent of our catch is exported, making New Zealand heavily dependent on world markets. By improving our access to these markets, we can improve the value we get from our fisheries.

So the government gets involved in international trade negotiations. These include market access negotiations with individual countries.

New Zealand is working on free trade agreements with a number of countries, including China. An agreement with China could triple the value of our exports there; and increased customs cooperation might curb the export of black market seafood products to China.

Catches in some Northern Hemisphere fisheries have fallen recently, bringing hard times for fishers. Some countries have helped their industries through subsidies. However, these make it cheaper for the companies to catch fish, which is unfair for New Zealand exporters. Some subsidies are for building more fishing boats, which can lead to overfishing.

So the government is working in the World Trade Organization to end fishing subsidies.



> Photo: Forum Fisheries Agency

## Working in the Pacific

The Ministry of Fisheries works closely with other government agencies to help Pacific Island countries get the most from their fisheries. In many of these countries, fisheries are their most important economic asset.

The largest and most valuable fisheries in the Pacific are tunas. These migrate across the region, and also visit New Zealand waters. To manage fish like these properly, all countries in the region and those who travel here to fish are working together to make sure catches are sustainable.

These countries have recently set up a Regional Fisheries Management Organisation to do this – the Western and Central Pacific Fisheries Commission. The New Zealand government is working in the Commission to set up programmes to keep track of where vessels are fishing and how much fish is caught. The government is also involved in negotiations around how these fisheries should be managed, and how they should be shared amongst the people and nations involved.

New Zealand works closely with individual Pacific Island countries on fisheries issues and is a member of the Forum Fisheries Agency, based in the Solomon Islands. The agency offers fisheries policy and technical services to Pacific Islands Forum countries.

The Ministry also works closely with its counterparts in the Pacific to develop the region's fisheries in a sustainable way. New Zealand has close constitutional ties and historical relationships with the Cook Islands, Niue and Tokelau. So it has a particular interest in working with these countries on the development of their fisheries.



# Managing Our Catch



## Setting catch levels

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It's almost 20 years since New Zealand brought in a quota system for managing its commercial fisheries.

Almost all the major commercial species are now included in this system.

They are managed in a way that lets us catch the greatest weight of fish, year after year, in a sustainable way. This is called managing for Maximum Sustainable Yield (MSY).

Managing for MSY means finding the delicate balance between taking what we'd like now, and leaving enough in the water to grow and breed for the future.

However, we need a lot of information to get this balance right. Ideally, we need to know what proportion of each fish stock is being caught each year. Knowing how quickly different species grow and reproduce, and how long they live, helps us work out sustainable catch levels. These levels are then adjusted, as more information on catches and abundance is gathered.

Commercial fishers must report their catches to the Ministry of Fisheries. This information can be used to work out trends in catch rates, and in some cases gives an idea of abundance. When there are more fish around, people usually find it easier to catch the same amount of fish from one year to the next. When there are fewer fish, it is usually harder to catch that same amount.

Knowing the catch rates and the size and age of fish caught is often enough to tell us how sustainable a particular catch level is. So in most important fisheries, we also gather information about length and age of fish caught. Some of this comes from Ministry of Fisheries' observers on board fishing vessels; some is gathered by the industry's own research programmes.

Where even more detailed information is needed, this can be collected through surveys by research vessels or tagging studies. However, these methods tend to be used only in our more valuable fisheries.

Where we have little information, it is hard to gauge how close a fish stock is to our target level. In these cases, the government must act cautiously, and set the catch at what it thinks is a safe level.

However, sometimes when we have little information the government may arrange to raise commercial catch levels slightly for a time, if quota owners agree to gather extra catch/effort data. Once this is analysed, the government decides whether to keep catches at the new level, increase them further, or reduce them.

Recreational fishers sometimes want different things from a fishery than commercial fishers. Particularly, they often want to be able to catch larger fish more easily. This may mean reducing catches to below the MSY level, so that more fish can grow larger. However, lowering catch limits simply for the sake of catching bigger fish might not be what commercial fishers want.

When catch levels need adjusting, the government seeks advice from Ministry of Fisheries' scientists and managers, as well as from commercial and non-commercial fishers, environmental interests, and the wider public.

Fisheries management in New Zealand is certainly not perfect. Some of our fish stocks have been over-fished. With only four million people, and the fourth largest exclusive economic zone in the world, we simply can't afford the science needed to manage all fisheries exactly at their Maximum Sustainable Yield.

The government must be cautious whenever it sets catch limits for fisheries, so that New Zealand's fisheries will continue to provide food and jobs for future generations.

## Species Focus - Hoki (*Macrurus novaezelandiae*)

Hoki is one of New Zealand's biggest fish exports, and forms an important part of the catch for offshore trawlers in New Zealand waters.

Hoki is caught mainly by mid-water trawl during spawning in late winter. This happens off the South Island's west coast and in Cook Strait. Outside this time, hoki are mainly caught by bottom trawl on the Chatham Rise and to a lesser extent in subantarctic waters.

Although hoki grow reasonably quickly, they do not mature and join the adult spawning population until they are four to five years old. There was a phase during the mid-late 1990s when fewer young hoki were produced. This meant a lot fewer adult fish were available over the last few years, so catch levels had to be reduced quite severely.



### Status of the fish stocks

Two hoki stocks are recognised in the HOK1 management area. The sizes of these stocks are monitored using trawl and acoustic surveys. Catch/effort data and information on size and age of fish caught are also used to assess the stocks annually.

The 2005 stock assessment indicates the western fish stock is below the government's target level. This happened because fewer young fish were coming through into the adult population. To let the stock rebuild, the government has cut catch limits, and is closely monitoring the situation.

The 2005 assessment indicates the eastern hoki stock is above the target level.

The catch limit of hoki has been progressively reduced from 250,000 tonnes in 2000/01 to 100,000 tonnes in 2005/06. Fishing at the current level appears sustainable, and the forecast is that hoki stocks overall will increase at a slow rate. How quickly they rebuild will depend on how many young fish come through into the fishery over the next few years.

## Current management issues

The main issue at present is ensuring enough young fish come through into the fish stocks. Most hoki spend their early years on the Chatham Rise fishing grounds, and it is important that enough of these fish reach mature size.

The industry has introduced fishing strategies that avoid catching too many young fish.

Other concerning issues are the deaths of seabirds and seals, and the impacts of bottom trawling in the hoki fishery.

The government and industry are working on ways to keep albatrosses and petrels away from the sterns of trawlers, where their trawl warps enter the water. The government is also working on the issue of bottom trawling in this fishery.

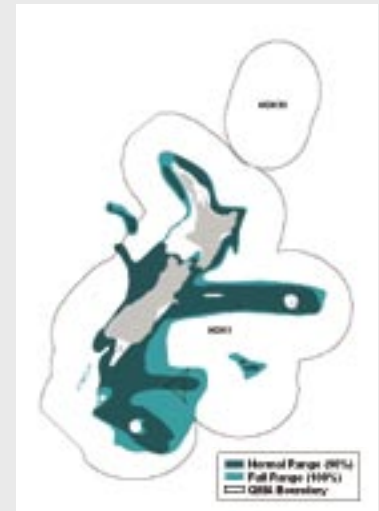
The industry has developed, and updates, a code of practice to avoid seal captures.

## Hoki catch limits and allowances

The catch limits and allowances for hoki have been set at 101,040 tonnes for the 2005/06 fishing year.

Of this, the government has allocated 100,000 tonnes to commercial fishers. This is split (by agreement between government and industry) between the two hoki stocks. The government has also allowed 40 tonnes to cover the combined recreational and customary catch, and 1000 tonnes to cover issues like illegal fishing (eg mis-reporting), and wastage or injury of fish.

The hoki fishery is managed using a range of restrictions. Some of these protect the fish stocks (eg catch limits and a voluntary code of practice to protect young fish). Others restrict large vessels from fishing close to shore, to protect the commercial viability of inshore fishers.



> Hoki distribution and management areas

### Species Focus - Kahawai (*Arripis trutta* and *A. xylabion*)

Kahawai is a particularly important fishery to recreational and Māori customary fishers; it is also caught by commercial fishers. Kahawai is part of a suite of fish that make up the 'catch plans' of purse seine vessels in New Zealand waters.

Most kahawai caught by non-commercial fishers are taken using set nets or lines. Most kahawai caught commercially is taken using purse-seine nets, with smaller amounts being caught in commercial trawl and set net fisheries.

Commercial fishers began targeting kahawai in the 1980s. Commercial catches peaked in 1987-88 at around 9600 tonnes. In 1991, commercial catch limits were set for kahawai targeted using purse seine nets.

Management of kahawai fisheries is causing some controversy. Recreational fishers say the numbers and size of kahawai they are catching have declined markedly, as a result of commercial purse seine fishing. Commercial fishers say that recent catches are at sustainable levels.



### Status of the stocks

Stock assessment work done in the mid-1990s suggested that kahawai stocks then were above a level that would support Maximum Sustainable Yield (MSY). Though these estimates are uncertain and depend on key assumptions, they are thought to be conservative. However, we have no more recent stock assessment than this.

Because of this uncertainty over stock size, catch limits and allowances were set cautiously – at around 7600 tonnes (around 15 percent less than recent catches had been) - when kahawai was brought into the quota system in 2004.

Kahawai catch levels were reviewed in 2005. It was assumed that the kahawai stocks would increase in size under the catch and allocation levels set in 2004. However, the government wanted to be more certain that stock size would increase, so it reduced the catch levels and allowances by a further 10 percent.

We need more information on kahawai stocks, and recreational catches of this fish. The current research programme for kahawai should provide a new stock assessment in 2007.

Until then, there remains uncertainty as to where current kahawai catch levels are in relation to the level that would support MSY. So we do not know whether the current catch limits and allowances are sustainable

### Current management issues

A key issue at the moment is how to manage the fishery in a way that takes the needs of non-commercial and commercial fishers into account.

Commercial fishers want kahawai stocks managed at the level of MSY, so they can catch the greatest amount of fish, year after year in a way that is sustainable.

However, recreational fishers want kahawai to be more abundant, and for bigger fish to be easier to catch. One way to do this would be to leave more fish in the sea. However this could mean that less fish could be taken each year.

### Kahawai catch limits and allowances

The catch limits and allowances for kahawai have been set at 6,834 tonnes for the 2005/06 fishing year.

Of this, the government has allowed 3,984 tonnes to cover the combined recreational and customary catch. It has also allowed 135 tonnes to cover things like accidental wastage during fishing. Commercial fishers have been allocated 2,728 tonnes.

At present there is no minimum legal size limit for kahawai taken recreationally. Up to 20 kahawai per day can be taken by recreational fishers within the mixed bag limit of 20 fish per person per day (except in the Southern Fishery Management Areas, where the daily limit is 15).

A range of commercial rules apply to kahawai, including catch limits and a voluntary fishing season. There are also voluntary commercial purse-seine fishing closures across a range of inshore areas from Northland to Kaikoura, including the Hauraki Gulf.



> Kahawai distribution and management area



### Species Focus - Orange Roughy (*Hoplostethus atlanticus*)

Orange roughy is a valuable commercial species. These fish are slow-growing, and long-lived. They are caught throughout the year, but the best catch rates are from June-early August, when they gather in dense groups to spawn (often over seamounts).

Orange roughy are caught from deep waters (800-1200 metres) by bottom trawling, with most catch being taken during the winter spawning season.

The main orange roughy fisheries are on the Chatham Rise, and off the southeast North Island/northern South Island. Most of New Zealand's orange roughy fisheries have had large reductions in catch over the years. They are now protected by low catch limits.



### Status of the fish stocks

It is not easy to manage orange roughy fisheries sustainably. Because these fish live in such deep water, they are difficult and expensive to research. We have made mistakes with this species, but we also have successes.

The Soviets and Japanese began commercially fishing orange roughy in the late 1970s. New Zealand companies joined in shortly after, as orange roughy became a 'boom' fishery. Total catches peaked at 54,000 tonnes in 1989. These fishers targeted dense spawning groups of fish. Initially, it was thought orange roughy would have similar growth rates and breeding success as other commercial species around the world.

However, by the late 1980s, scientists had discovered this was not the case. Orange roughy were found to be very long-lived (over 100 years) and slow growing. Unfortunately this came too late to save the Challenger (ORH7A) fishery, which has been effectively closed since 2000.

Today, we know more about these valuable fisheries and have become better at managing them. But there are still some big holes in our knowledge: we know little about how many young fish are out there, or the age structure of our fish stocks.

New Zealand's main orange roughy fisheries are on the Chatham Rise (ORH3B), and off the southeast North Island/northern South Island (ORH2A, 2B, 3A). All our orange roughy fisheries are managed towards producing the Maximum Sustainable Yield (MSY) of fish.

Assessments of fish stocks in these areas are done regularly, using a range of information. This includes trawl and acoustic surveys, information on the size of fish caught, and commercial catch / effort data.

The orange roughy stock on the northeast Chatham Rise appears to be in good shape, and is currently above management targets. This is the biggest orange roughy fishery in the world.

The southeast North Island/northern South Island roughy stocks also seem to be in good shape. They appear to be rebuilding, and catch levels have been set in line with this.

Of our 11 roughy stocks, scientists think six are probably near or above the government's target level. Three stocks are below the target (two of which have been closed), and the state of two exploratory fisheries is unknown.

## Current management issues

The environmental damage caused by bottom trawling is an issue in this fishery, particularly as past fishing has damaged sensitive seamount habitats in a number of areas.

The government and industry are working together to limit further habitat damage in orange roughy fisheries.

During 2006, assessments are being done for orange roughy stocks around the Subantarctic Auckland Islands, the East Cape, Northeast Chatham Rise, and Northwest Chatham Rise.

## Orange roughy catch limits and allowances

The catch limits and allowances for orange roughy have been set at 16,704 tonnes for the 2005/06 fishing year. Of this, the government has allocated 15,921 tonnes to commercial fishers. It has also allowed 793 tonnes to cover issues like illegal fishing (eg mis-reporting), and wastage or injury of fish.

Orange roughy fisheries are managed using a range of restrictions. Some of these protect the fish stocks (eg catch limits and voluntary industry restrictions within management areas). Others protect deep water habitats by closing some seamount areas to trawling.



- > Orange Roughy distribution and management areas



### Species Focus - Paua (blackfoot paua - *Haliotis iris*)

Paua is highly valued by both our non-commercial and commercial sectors.

It is a particularly valued customary fishery, as providing paua at important events like hui or tangi helps uphold the mana of the host marae. The use of paua shell for decoration and fishing devices is also a big part of Māori tradition. In some places, paua is an important part of the diet.

The main paua fisheries are in the lower half of the North Island (Wairarapa/ Wellington south coast), top of the South Island (outer Marlborough Sounds and Kaikoura), the lower half of the South Island (Otago/Southland/Fiordland), Stewart Island and the Chatham Islands.

Because paua is so commercially valuable and so easy to access, the theft and illegal sales of these shellfish is a big problem. The government has increased its focus on this issue.

### Status of the stocks

Stock assessments for most of our main paua stocks are completed every three to five years. No stock assessment is done for the lower North Island stock.

Assessments for the Marlborough Sounds and Chatham Islands fisheries have been updated in the last two years.

Paua stocks in the Marlborough Sounds are rebuilding to a level that will better support a stable, sustainable fishery. Paua around the Chatham Islands are thought to be sustainable at current catch levels.

Stewart Island stocks are currently thought to be at sustainable levels, since catches there were reduced in 2002.

The Southland/Otago stock was assessed in 2006. The assessment produced ambiguous results, so we don't know whether catches are sustainable here at the current level.

For the Fiordland paua stock, the 2006 assessment showed that the current catch levels are not sustainable.

## Current management issues

The most important management issue in this fishery at present is the theft and illegal sale of paua. This is particularly a problem around the lower North Island.

Actual quantities stolen are hard to accurately estimate. However, some estimates suggest that nearly as much paua may be stolen each year as is harvested commercially. Industry and government are working together on ways to reduce this theft.

Another issue that affects paua fisheries is that paua will bleed to death if cut. This is a problem where fishers damage a paua when taking it, then find out it is too small and have to put it back.

## Paua catch limits and allowances

The commercial catch limit for all paua stocks have been set at 1059 tonnes for the 2005/06 fishing year.

Allowances for recreational and customary catch have not yet been made in every paua stock. Likewise, allowances for issues such as paua mis-handling (bleeding to death), theft (poaching and illegal sales), and illegal fishing (eg mis-reporting) have not yet been made in every paua stock.

Paua size limits are the same for recreational and commercial fishers.

Recreational fishers can take 10 paua per person per day in most areas. However, smaller bag limits are in place in Fiordland and some mātaītai reserves. In the Otago/Southland fishery, recreational fishers have introduced a voluntary bag limit of five paua per person per day.



> Paua distribution and management areas



### Species Focus - Red Rock Lobster (*Jasus edwardsii*)

Rock lobster (crayfish) is one of New Zealand's most valuable species. It is highly sought after by both commercial and non-commercial fishers throughout New Zealand.

The largest commercial catches of rock lobster are landed in Southland/Fiordland (CRA8) and along the south east coast of the North Island (CRA4).

Non-commercial fishers mostly catch rock lobster by diving, but baited pots are also widely used. Commercial fishers mainly use baited pots.

Theft and illegal sale of rock lobsters is a major problem, particularly on the east coast of the North Island.

### Status of the stocks

There are nine major rock lobster management areas in New Zealand – CRA1-9. Stock assessments for CRA3, CRA4, and CRA5 have been updated within the past two years.

The assessment for fish stocks in the Gisborne (CRA3) area indicates these are below the government's target level. Commercial catches in CRA3 have been reduced from 327 to 190 tonnes, to help the stocks rebuild.

Catch rate information from the southern rock lobster fisheries (CRA7 and 8) suggests these stocks have rebuilt faster than expected, following catch reductions in 1999/2000 and 2001/02. The government has now increased harvest levels in these fisheries.

Fisheries in the other main management areas are assessed to be at a level around the government's target.

## Current management issues

Rock lobster fisheries face a number of challenges throughout New Zealand, particularly theft and conflicts over access to fisheries.

There are a growing number of recreational fishers around New Zealand; there is also an increasing interest in management of customary fisheries. This pressure to conserve rock lobster fisheries for non-commercial interests tends to be greater in coastal lifestyle and holiday areas (in the CRA3 area, commercial fishers have voluntarily agreed to stop fishing during the summer holiday period, to reduce conflict with recreational fishers).

Added to this competition is the fact that reserves and other fishing restrictions have either closed fishing grounds completely, or closed them to commercial fishing.

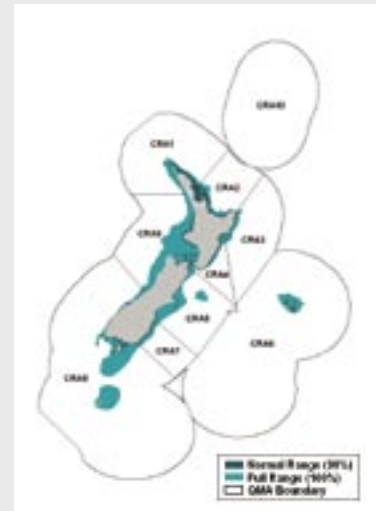
The combined effect means increasing competition for rock lobster resources across a decreasing number of fishing areas.

## Rock lobster catch limits and allowances

The catch limits and allowances for rock lobster have been set at 3,359 tonnes for the 2005/06 fishing year.

Of this, the government has allowed 156 tonnes to cover customary fishing, and 325 tonnes to cover recreational catch. It has also allowed 289 tonnes to cover such things as theft (poaching and illegal sales), illegal fishing (eg mis-reporting), and injury of fish. Commercial fishers have been allocated 2,589 tonnes.

Rock lobster fisheries are managed using a range of catch limits, size limits, gear restrictions and closures. These include size limits and daily catch limits for recreational fishers, and an annual catch allocation for commercial fishers in each management area. Regulations also include escape gaps in all lobster pots to let undersized lobsters get out.



- > Red Rock Lobster distribution and management areas



### Species Focus - Snapper (*Pagrus auratus*)

Snapper is arguably New Zealand's most important finfish species. It is an iconic recreational and customary catch in northern New Zealand. It is also an important commercial catch in this same area.

Commercial fishers target snapper using a range of methods: longline, trawl, Danish seine, beach seine and set nets. Snapper are also often taken as by-catch in northern fisheries.

Non-commercial fishers catch snapper using fishing rods and lines from boats and the shore, and on a small scale, set nets.

Snapper was overfished in many places around New Zealand in the 1960s and 70s. Commercial landings peaked in 1978, at 18,000 tonnes. Rebuild of these snapper stocks has been slow, with several still below the government's target level.



### Status of the stocks

There are four major snapper management areas in New Zealand - East Northland/Hauraki Gulf/Bay of Plenty (SNA1), West Coast North Island (SNA8), East Coast North Island (SNA2), and Marlborough/Tasman (SNA7). All are currently managed towards producing the Maximum Sustainable Yield (MSY) of fish, although some stocks are still below this level.

The SNA1 and SNA8 areas have the largest fish stocks. These are monitored using tagging programmes, information on size and age of fish caught, and commercial catch/effort data. Fish in SNA2 and SNA7 are monitored using information on size and age of the catch.

A recent tagging survey of snapper in SNA8 showed stocks there were not rebuilding as fast as the government had hoped. So catch limits were cut recently, to speed up the rebuild.

Stock assessments indicate that fish stocks in East Northland are at or above the government's target level.

Assessments indicate that fish stocks in the Hauraki Gulf/Bay of Plenty are still below the government's target level. So catch limits there have been set to allow rebuilding.

The fish stocks in SNA2 were recently found to have rebuilt to a level where the catch could be increased.

## Current management issues

A tagging survey is planned for the SNA1 fishery management area.

Surveys of recreational fishers in the SNA1 area were done during the 2003/04 and 04/05 summers. These will tell us more about the recreational catch in this area. The results from the SNA1 recreational harvest survey should be available in late 2006.

A survey of recreational catch in SNA8 is planned for 2006/07. Results from this should be available in early-2008.

Recreational fishers would like snapper catches reduced to below the MSY level. This would leave more fish in the sea, and let fishers catch larger fish more easily. The government is currently looking into this issue.

## Snapper catch limits and allowances

The catch limits and allowances for snapper have been set at 10,133 tonnes for the 2005/06 fishing year.

Of this, the government has allowed 3165 tonnes to cover the combined recreational and customary catch. It has also allowed 611 tonnes to cover things like theft (poaching and illegal sales), illegal fishing (eg mis-reporting), and wastage or injury of fish. Commercial fishers have been allocated 6357 tonnes.

A variety of catch limits, size limits, gear restrictions, and closures are used to manage our snapper fisheries. These include minimum size limits and daily catch limits for recreational fishers.

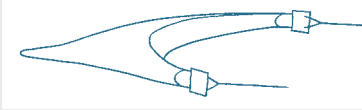
Management measures also include trawling and Danish seining bans in all the harbours of SNA1 and SNA8, and many of the large sheltered bays in SNA1. This protects young snapper, and reduces conflict between commercial and non-commercial fishers.



- > Snapper distribution and management areas

## Common New Zealand Fishing Methods

### Trawling

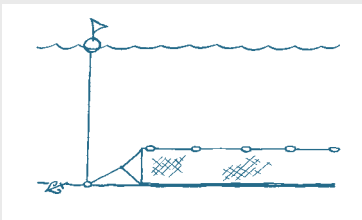


Trawling involves towing a specialised net. Steel paravanes (trawl doors) are adjusted to 'fly' through the water in opposing directions and hold the mouth of the net open. The trawl doors are attached to winches on the boat by heavy steel cables (trawl warps).

A trawl net towed across the fishing grounds catches marine life that cannot out-swim it. The net is set up to herd marine life into its mouth. Eventually, fish become worn out from swimming and end up in the narrow tail of the net (cod end). The size of net mesh controls what size fish can escape from the trawl.

In New Zealand, most trawling is carried out near the bottom, and in water depths ranging from around ten metres to more than a kilometre.

### Set netting



Set netting involves setting a net, either in mid-water, or on or near the bottom. Set nets are made from fine nylon, so fish can't see them. They may be up to 10 metres high and several hundred metres long.

These nets catch marine life that swims into them and gets tangled. Fish bigger than the net's mesh size get tangled in the net by their gills or fins; smaller fish swim through the net.

Set netting usually occurs in shallow waters, within a few miles of the coast.

## Longlining

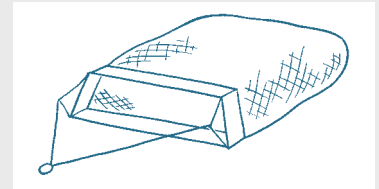
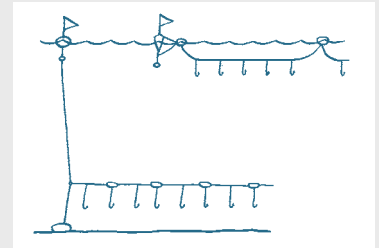
Longlining involves setting a single line with many baited hooks on it. Commercial longlines vary in length from tens of metres to several kilometres in length and can have tens to thousands of hooks on a single line. These lines catch marine predators with a mouth large enough to take in the bait and hook.

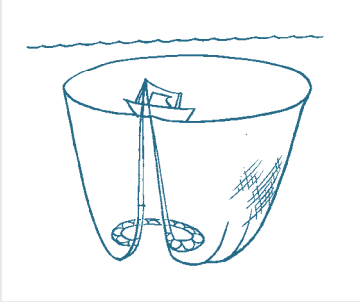
Surface longlines are usually set in the open ocean, at depths of 50-200 metres or more below the surface. Conventional bottom longlines are set along the sea floor, in water depths ranging from around 10 metres down to around two kilometres. Bottom 'droplines' are set vertically, and have only a few hooks on each line.

## Dredging

Dredging involves towing a steel net (dredge) across the bottom. Most dredges in New Zealand are around 2-4 metres across the mouth. They catch anything that lives on the bottom and can't swim away.

Dredging usually occurs in shallow waters, between 10 and 100 metres deep.



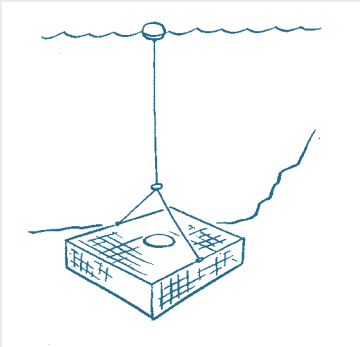


## Seining

Seining involves setting a net to surround and trap a school of fish. The net is then hauled in, and the fish captured.

Purse seining is used to catch surface-schooling fish. A small boat is used to lay a specialised net around the school to surround them. A drawstring running around the bottom of the net is then pulled tight, preventing escape out the bottom. The net is then drawn into a smaller and smaller circle. This eventually traps the fish in a tiny area, and they can be scooped out with smaller nets.

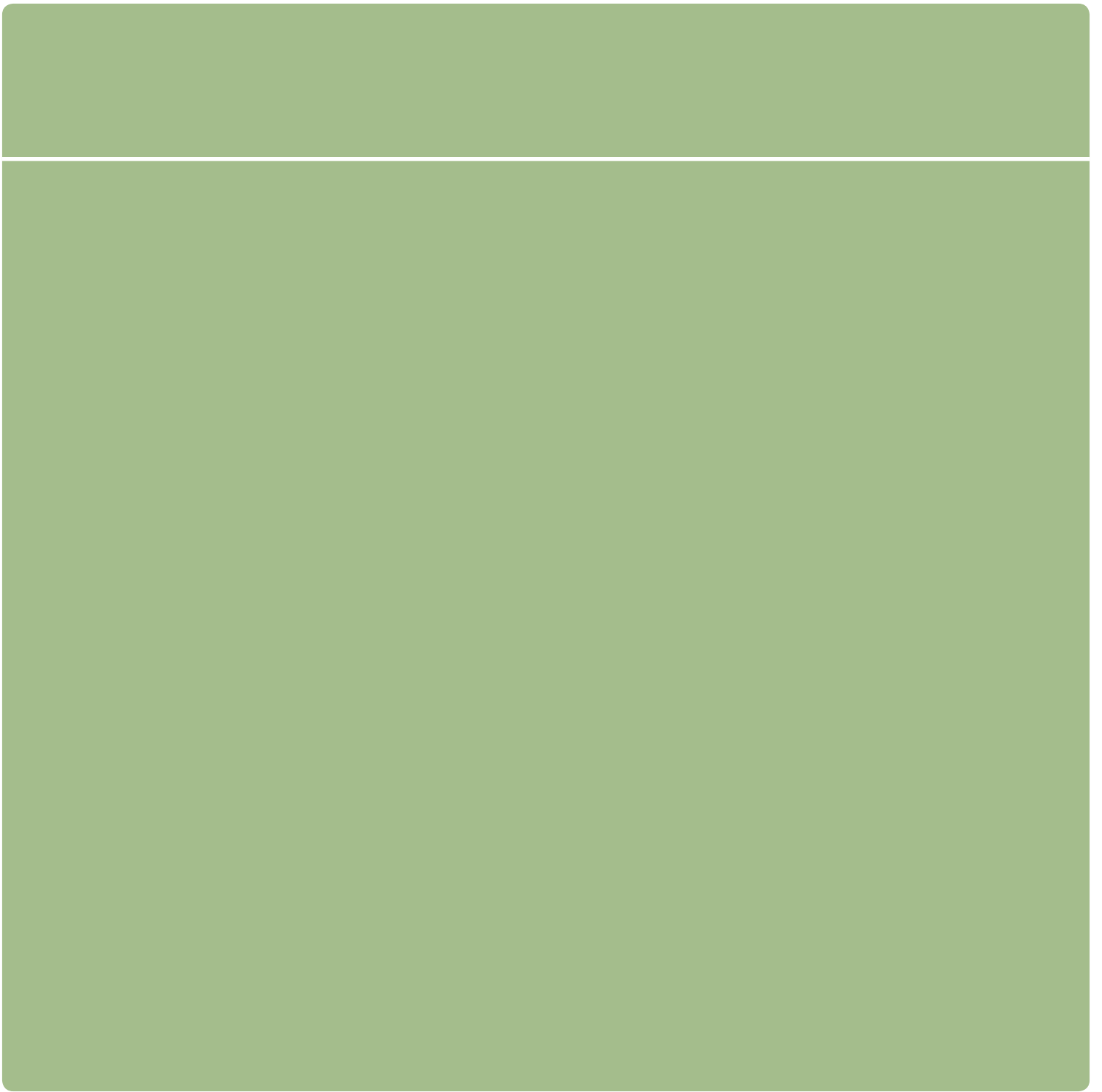
Danish seining is used to catch schools of fish near the bottom, particularly in inshore waters where trawling is not practical (eg places that are surrounded by rocks and reefs). Danish seines are like trawl nets, but with long 'wings' and weighted ropes either side of the net opening. The net and ropes are set to surround the schools of fish. As the weighted ropes are drawn in, they drag across the bottom, scaring the fish towards the net. The net is then hauled up and onto the boat.



## Potting

Potting involves setting a baited trap on the sea floor. These traps (pots) have one or more entrances through which animals can enter easily, but find it difficult to get back through. They also have 'escape' holes that let undersized animals get out easily.

Some pots are made of nylon mesh; others are made from steel and wire.







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ISBN 0-478-11902-X  
May 2006