Ministry of Fisheries
Te Tautiaki i nga tini a Tangaroa

National Fisheries Plan for Deepwater and Middle-depth Fisheries

Part 1B

New Zealand Government

Hoki
FISHERIES PLAN

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Introduction

This chapter of the National Deepwater Plan sets the operational objectives and performance criteria for the hoki fishery and key bycatch fisheries. Specifically it addresses the management of the following quota management species:

- Hoki: eastern and western stocks (target)
- Silver warehou (bycatch and target)
- Frostfish (bycatch)
- Spiny dogfish (bycatch)
- White warehou (bycatch)
- Lookdown dory (bycatch)

This chapter also addresses the management of adverse environmental effects caused by hoki fishing activity.

Hake and ling, both of which can be a significant bycatch of hoki fishing, are not included but separate chapters will be developed for both species which will complement the hoki chapter.

This chapter also indirectly addresses the Conditions of Certification in place in the hoki fishery as part of the current Marine Stewardship Council (MSC) Certification of the fishery. This is achieved through developing the operational objectives around specific conditions of certification.

This chapter consists of the following sections:

1. Summary of five year management actions
2. Overview of the hoki fishery
3. Overview of non-target interactions
4. Operational objectives for the hoki fishery
5. Measuring performance

Summary Five year actions for the hoki fishery	Single/ Multiple year or Annual delivery	Start	Expected delivery date
Actions to contribute to the Use Outcome: Fisheries resources are used in a manner that provides greatest overall economic, social, and cultural benefit			
1. Provide information and support to ensure the hoki fishery successfully completes the Marine Stewardship Council (MSC) annual surveillance audit during 2010 & 2011	Multiple	2010	2011
2. Provide information and support to ensure the hoki fishery is successfully recertified by the MSC in 2012	Single		2012
3. Develop and implement a programme to maximise economic yield from the hoki fishery	Multiple	2010	2011
4. Develop and implement a cost/benefit evaluation process to assess proposed management interventions in the hoki fishery	Multiple	2010	2011
5. Develop and implement a revised Memorandum of Understanding with the DeepWater Group Ltd (DWG)	Single		2010
6. Produce the Annual Operational Plan & Annual Review Report and publish both documents on the MFish website by July and December respectively each year	Annual	2011	2015
7. Only utilise research to inform the management of the hoki fishery that has met or exceeds the requirements of the Research Standard	Annual	2011	2015
8. Complete a research project to assess the management of the hoki fishery against international best practice standards and guidelines	Single		2013
9. Annually assess the performance of the hoki fishery against the regulatory regime through a series of compliance benchmarks	Annual	2011	2015
10. Establish an Environmental Advisory Group, in collaboration with environmental stakeholders, to provide for ENGO engagement in the management of deepwater fisheries including hoki	Single		2010
11. Increase iwi participation in deepwater fisheries management through membership of the DWG (target of 70% of iwi represented directly or indirectly by the DWG by 2013)	Multiple	2010	2014

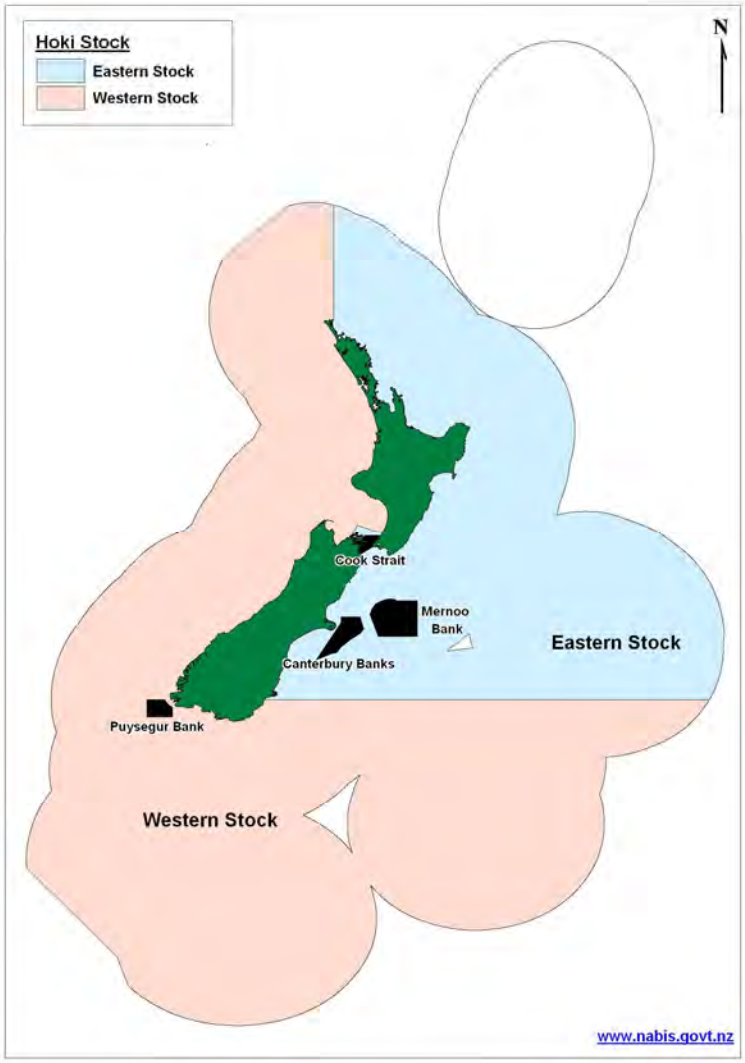
Summary Five year actions for the hoki fishery	Single/ Multiple year or Annual delivery	Start	Expected delivery date
Actions to contribute to the Environment Outcome: The capacity and integrity of the aquatic environment, habitats and species are sustained at levels that provide for current and future use			
12. Information on the performance of the hoki fishery against compliance benchmarks is reported in the Annual Review Report including details of actions taken if breaches have occurred	Annual	2011	2015
13. Complete and implement the hoki harvest strategy	Single		2010
14. Develop and implement a harvest strategy for silver warehou	Single		2011
15. Develop and implement a harvest strategy for white warehou	Single		2012
16. Develop and implement a harvest strategy for lookdown dory	Single		2013
17. Develop and implement a harvest strategy for frostfish	Single		2014
18. Develop and implement a harvest strategy for spiny dogfish	Single		2015
19. Refine and implement a transparent, in-season monitoring regime to audit performance of the hoki fishery against the east/west stock split as well as the hoki management areas, and report on performance in the Annual Review Report	Single		2011
20. Annually review the deemed value rates for hoki and key bycatch stocks and amend as necessary	Annual	2011	2015
21. Complete an Ecological Risk Assessment (ERA) for the hoki fishery which will include key bycatch stocks	Single		2011
22. Develop a policy position on what is meant by "habitats of particular significance for fisheries management purposes" with respect to the hoki fishery	Single		2012
23. Ensure the hoki fishery is managed so that it fully meets the requirements of the Seabird Standard from 2011*	Multiple	2011	2012
24. Implement a monitoring regime to improve the quality of data on shark bycatch in the hoki fishery	Single		2011

25. Use the results from the ERA to implement a management programme (regulatory/non-regulatory) to manage any adverse effects of hoki fishing activity on at-risk shark species	Annual	2013	2015
26. Use the results from the ERA to implement a management programme (regulatory/non-regulatory) to manage any adverse effects of hoki fishing activity on at-risk marine mammal species identified through the ERA process	Multiple	2012	2013
27. Complete a qualitative risk assessment for the non-QMS bycatch species caught in the hoki fishery	Single		2012
28. Report annually on the quantities of non-QMS species caught in the hoki fishery, based on observer data	Annual	2011	2015
29. Produce a map of the extent of the hoki trawl grounds annually	Annual	2011	2015
30. Assess the extent of the hoki trawl grounds against the revised Benthic Optimised Marine Environment Classification	Single		2011
31. Ensure hoki fishery is managed so that it fully meets the requirements of the Benthic Impact Standard from 2013*	Multiple	2013	2015

* Dependent on an approved standard being in place by this date

1. Overview of the hoki fishery

Map 1: Hoki fishery detailing the boundaries between the eastern and western stocks and the hoki management areas



Biological Overview

Hoki is widely distributed throughout New Zealand waters and occurs in depths of 10m to over 900m, with greatest abundance between 200m to 600m. Adult fish are typically found in deeper water while juveniles are found at shallower depths.

Hoki is a reasonably fast growing species. Juveniles reach about 27-35 cm at the end of their first year and males and females grow to lengths of about 115 cm and 130 cm respectively (up to 7 kg in weight). Hoki characteristically spawn for the first time at age 3-5 years and can live for around 20-25 years. Spawning occurs during the winter months at two main spawning grounds; the west coast of the south island (WCSI) and the Cook Strait, although not all hoki spawn every year. Juvenile hoki from both areas mix on the Chatham Rise.

The best available information indicates that there are two hoki stocks and hoki are thought to migrate to either the eastern or to the western stock on maturity. Juveniles from both the stocks are found on the Chatham Rise throughout the year. Fecundity is moderately high, although not all hoki within the adult size range spawn every year.

For more information on the biology of hoki and the biological status of the stock see the current Ministry of Fisheries Plenary Report available at www.fish.govt.nz

Fisheries Management Overview

The hoki trawl fishery is currently managed as two distinct stocks under a single total allowable commercial catch (TACC), HOK1, which covers fisheries management areas 1–9. The two stocks, an eastern and a western stock, consist of the following defined fishing areas:

1. Eastern hoki stock: Cook Strait, Chatham Rise, East Coast South Island (ECSI) and East Coast North Island (ECNI).
2. Western hoki stock: West Coast South Island (WCSI), Sub-Antarctic and Puysegur Bank.

The main hoki spawning fishery operates from mid-July to late-August on the WCSI, where hoki aggregate to spawn. A second major spawning fishery occurs in Cook Strait where the season runs from late-June to mid-September, peaking in July and August. Small catches of spawning hoki are taken from other spawning grounds off ECSI and, late in the season, at Puysegur Bank.

Outside the spawning season there is a substantial fishery on the Chatham Rise and a smaller fishery in the Sub-Antarctic. The Chatham Rise fishery generally has constant catch levels across all months except July to September when catches are lower because fishing vessels move to the spawning grounds. In the Sub-Antarctic, catches typically peak in April to June. There is also a small ECNI hoki fishery.

In 2001 quota owners implemented agreed catch limits within the TACC to manage catches from both the eastern and western stocks. Proportions of the TACC taken from each stock are set based on the annual stock assessments, and between 2004–2007 the limits were set to provide for 60% of the TACC to be taken from the eastern stock and 40% from the western stock. These proportions were adjusted in 2007, in conjunction with the TACC reduction to 90,000 tonnes, to 72% from the eastern stock and 28% from the western stock to provide for the rebuild of the western stock. The limits are currently set so that, as of October 2010, within a TACC of 120,000 tonnes 60,000 tonnes is allocated to the western stock and 60,000 to the eastern stock. The catch split arrangement is reviewed regularly.

Quota owners have also implemented a range of non-regulatory management measures to reduce catches of juvenile hoki in order to improve stock recruitment. These measures include closing four areas, shown to contain significant proportions of juvenile hoki, to target hoki fishing. These areas, known as the hoki management areas, are still accessible to trawlers targeting other species such as scampi, ling, silver warehou and squid. The Ministry of Fisheries monitors and audits vessel performance against these management measures.

The 2010 stock assessment estimates both eastern and western stocks to be above B_{MSY} (which is estimated to be around 24% B_o):

- The eastern stock is estimated to be between 51-57% B_0
- The western is estimated to be between 40-52% B_0

The core elements of the harvest strategy in place for hoki are as follows:

Table 1: Hoki harvest strategy

Harvest strategy components	Management response
Management target range of 35 - 50% B_0	Stock permitted to fluctuate within this management target to an acceptable level.
Soft limit of 20% B_0	A formal time constrained rebuilding plan should be implemented if this limit is reached.
Hard limit of 10% B_0	The limit below which fisheries should be considered for closure
Rebuild strategy	Catch limit set to deliver half the rate of rebuild that would occur in the absence of fishing.
Harvest control rule	Management actions determined by the results of a series of forward projections under a range of catch assumptions, guided by the biological reference points

The majority of hoki quota owners (95%) are represented through the DeepWater Group Ltd (DWG), the commercial stakeholder organisation responsible for the majority of deepwater and middle-depth fisheries. In 2006 the Ministry of Fisheries and DWG signed a Memorandum of Understanding (MOU) which set out how DWG and MFish would work collaboratively to improve the management of deepwater fisheries (including hoki). Benefits to date from this collaborative arrangement include:

- An improved working relationship between both parties, resulting in an open and collaborative dialogue;
- Better information sharing;
- Improved ability to work collaboratively to develop better quality policy advice;
- Industry being more open about involving the Ministry in their management issues;
- Improved engagement on informed and assisted compliance; and
- Improved environmental management and mitigation across some areas, such as seabird interaction mitigation.

Environmental Overview

The hoki trawl fishery interacts with a range of protected species, most notably seabirds and fur seals, and the benthic habitat in the bottom trawl fishery on the Chatham Rise.

Where these interactions are determined to be adverse, management intervention is required to minimise the severity of the impact. A key focus of this National Deepwater Plan is to ensure that adverse effects are avoided and minimised and that all interactions are managed and assessed against agreed environmental performance standards.

As yet no formal standards exist and, in their absence, the management focus is on ensuring that once environmental standards are in place, New Zealand's deepwater fisheries, including hoki, are operating at a level above that which is required by the standard. Although it is not possible to assess if the hoki fishery has yet met this aspirational state efforts are in place to achieve this. These include both mandatory measures (such as seabird mitigation measures and catch limits for certain bycatch fishstocks) and a range of non-regulatory measures implemented by industry and monitored and audited by the Ministry of Fisheries.

Section 2 provides more information on the extent of environmental interactions in the hoki target trawl fishery.

Economic overview

Sixty five per cent of hoki quota is held by three companies. These companies are also active participants in the fishery and typically account for approximately 60% of the annual hoki catch. The hoki fleet predominantly consists of large domestic and foreign chartered factory vessels, although there is an important inshore fishing fleet operating seasonally on the WCSI and in the Cook Strait.

The hoki fishery, largely because of its size, is one of the most commercially valuable fisheries in New Zealand. In 2009 the total market value of hoki quota was estimated to be $815M.

Hoki is also one of the most important export earners for the fisheries sector. In 2009, 34,858 tonnes (product weight) of hoki was exported, realising a value of $152.5M. The destination for much of these exports is China, where the product is further processed for re-export into Europe and the USA. Australia is also becoming a major export market for hoki. Almost all hoki is exported as frozen product. There is a limited domestic market for hoki where it is sold primarily as a frozen product through supermarkets.

The hoki fishery received Marine Stewardship Council Certification in 2001 and was recertified as a sustainably managed fishery for a further five years in 2007. Some eNGOs do not support the certification of the hoki fishery because of ongoing concerns around the sustainability of the Western stock and the environmental impact of the hoki fishery. For these reasons hoki continues to be ranked by eNGOs near the bottom of their consumer "Best Fish" guides. The Ministry of Fisheries does not support this view.

Compliance overview

The hoki fishery is subject to an extensive range of regulatory measures aimed at improving the management of the entire fishery – including its effect on bycatch species. The following compliance risks have been identified as being of particular relevance to the hoki fishery and these are described in more detail below:

1. Discarding
2. Misreporting catch
3. Failure to deploy environmental mitigation devices.

These risk areas have been identified based on the results of previous investigations and successful prosecutions.

Discarding
Discarding is of particular concern in the hoki fishery and is prohibited under s 72 of the Fisheries Act 1996. Discarding allows fishers to increase their income by avoiding QMS-related expenses such as acquiring annual catch entitlement (ACE) or paying deemed values. Bycatch species of the hoki fishery are especially vulnerable to this type of offending.

Another factor which can contribute to discarding is when fishers choose to deliberately discard smaller, damaged or the less valuable fish of a particular species to maximise economic return.

Misreported Catch
Misreporting occurs when incorrect weights, quantities, species, or landed states are reported. The primary motive behind this type of offence is to minimise the use of ACE and related deemed value charges.

Deployment of seabird mitigation devices
Regulation requires that all deepwater trawl vessels operating in the hoki fishery deploy bird mitigation devices to ensure that fishing activity does not pose an unnecessary risk to seabirds.

MFish strives to minimise the opportunity for these and other types of offending to occur through careful risk analysis of the hoki fishery with cooperative input from industry. Information sharing between MFish and industry allows the Ministry to adapt compliance efforts to current risks. It also helps the development of and monitoring against the compliance standards and benchmarks necessary to achieve many of the objectives within this National Deepwater Plan.

Social overview

The Fisheries Act (1996) (the Act) requires that, prior to setting management measures for hoki, the Minister of Fisheries shall consult with persons having an interest in the stock or the effects of fishing on the aquatic environment in the area in which the fishery takes place, including Maori, environmental, commercial and recreational interests. In addition the Act requires that in setting a TAC under section 13, the Minister shall have regard to such social, cultural and economic factors (s)he considers relevant.

Social and cultural factors include those related to the harvesting of hoki by all parties; commercial, recreational and customary. However, there is little recreational or customary hoki fishing. There is an allocation of 20 tonnes apiece available to both sectors but there is no information available on the amount of this allocation that is harvested annually.

Social and cultural factors also include the non-extractive value of healthy hoki and key bycatch stocks and the values associated with an aquatic environment that is not adversely impacted on by hoki fishing activity. These intrinsic values must also be considered when determining the appropriate management measures for a fishery.

The generic management objectives described in the National Deepwater Plan and the fishery specific objectives described in this chapter ensure that these social and cultural requirements also guide the management of the hoki fishery.

2. Overview of Non-target Interactions

This section describes in more detail the relevant non-target bycatch (see Table 1) and incidental interactions and captures that occur in the hoki fishery. The bycatch and incidental captures are categorised as follows:

1. **Key bycatch species:** These are species which, while not specifically targeted by this fishery, are of economic value. They are predominantly QMS species and therefore will be included in a fishery specific chapter of the National Deepwater Plan; in some cases it will be the hoki chapter, as is the case for silver warehou, and in other cases it will be included in another chapter of this plan. However, some of these key bycatch species are predominantly inshore species and therefore will be managed as part of the inshore fisheries planning process.

   There are 26 key bycatch species typically harvested in a hoki trawl.

   As a rule, species that account for at least 1% of the total catch weight in the hoki fishery will be included in the hoki chapter as a key bycatch species. An exception will be made if the 1% criteria is not met where the species is part of the deepwater fisheries complex and the majority of the bycatch is coming from the hoki fishery, as is the case with frostfish.

   Five key bycatch species are included in this hoki chapter:

   a. Silver warehou
   b. Spiny dogfish
   c. Frostfish
   d. White warehou
   e. Lookdown dory

2. **Incidental bycatch species:** These are non-QMS species which are usually discarded or rendered to fish meal and are considered to be of little commercial value.

   Over 94% of the catch typically harvested in a hoki target trawl is made up of QMS species. Incidental bycatch species account for less than 6% of the total catch with javelinfish and rattails accounting for over half of the incidental bycatch species harvested.

   Catch levels for these incidental bycatch species will be monitored continually and assessed annually. If harvest levels increase and there are concerns that this may be affecting the sustainability of these incidental bycatch species, then these matters will be addressed through the policy for the introduction of new species into the QMS or through section 11 sustainability measures, such as catch limits, gear restrictions or closed areas.

3. **Incidental interactions of endangered, threatened and protected (ETP) species:** This category relates to the accidental capture, interaction and mortality of

protected species such as seabirds, marine mammals, protected corals and protected shark species.

4. **Benthic interactions:** This category includes benthic invertebrate species that are captured by, or that are known to interact with, hoki trawl gear. This information is based on MFish observer reports.

Fish and invertebrate species taken as bycatch or incidental catch in the hoki fishery for the last three complete fishing years are shown in Table 1 below. This information is based on data collected by MFish observers.

The table is colour coded as follows:

- Those species highlighted in blue are **key** bycatch species managed through the hoki chapter
- Those species highlighted in orange are **key** bycatch species managed through another chapter in the National Deepwater Plan.
- Those species highlighted in green are **key** bycatch species managed through the highly migratory species fisheries plan.
- Those species highlighted in yellow are **key** bycatch species managed through an inshore fisheries plan
- Remaining species are **incidental** bycatch species which will be monitored annually as part of this hoki fisheries chapter.

Table 2: Catch weight by species name for the top 50 species caught in hoki trawls – from observer records for the period 1 October 2006 to 30 September 2009

	2006/07		2007/08		2008/09	
Common name	**Sum of observed catch (t)**	**% of catch**	**Sum of observed catch (t)**	**% of catch**	**Sum of observed catch (t)**	**% of catch**
Hoki	18,864.5	85.96	20,139.5	83.13	19,521.6	87.17
Ling	475.2	2.17	1,210.9	5.00	548.0	2.45
Javelinfish	573.2	2.61	601.3	2.48	494.0	2.21
Rattails	200.4	0.91	372.5	1.54	334.2	1.49
Silver warehou	358.3	1.63	221.7	0.92	190.8	0.85
Hake	208.7	0.95	227.5	0.94	227.1	1.01
Spiny dogfish	238.4	1.09	214.6	0.89	187.3	0.84
Frostfish	176.4	0.80	159.5	0.66	132.7	0.59
White warehou	166.7	0.76	116.7	0.48	58.0	0.26
Pale ghost shark	84.5	0.39	131.4	0.54	81.4	0.36
Black oreo	50.4	0.23	81.2	0.34	13.6	0.06
Shovelnose dogfish	25.9	0.12	73.3	0.30	34.7	0.16
Ribaldo	41.5	0.19	49.1	0.20	27.2	0.12
Southern blue whiting	1.1	0.00	60.9	0.25	37.3	0.17
Lookdown dory	48.1	0.22	24.4	0.10	24.4	0.11
Baxter's lantern dogfish	6.9	0.03	62.4	0.26	22.2	0.10
Alfonsino	59.4	0.27	20.3	0.08	8.6	0.04
Sea perch	38.6	0.18	33.0	0.14	15.9	0.07
Blue warehou	0.2	0.00	0.5	0.00	80.2	0.36
Squid	27.2	0.12	24.1	0.10	16.3	0.07

	2006/07		2007/08		2008/09	
Common name	**Sum of observed catch (t)**	**% of catch**	**Sum of observed catch (t)**	**% of catch**	**Sum of observed catch (t)**	**% of catch**
Other sharks and dogfish	21.7	0.10	29.7	0.12	14.2	0.06
Redbait	7.9	0.04	12.1	0.05	41.9	0.19
Stargazer	23.5	0.11	22.4	0.09	14.2	0.06
Jack mackerel	0.6	0.00	1.5	0.01	47.8	0.21
Rays bream	7.1	0.03	17.4	0.07	23.3	0.10
Silverside	13.4	0.06	26.9	0.11	7.1	0.03
Smooth skate	14.2	0.06	21.5	0.09	10.5	0.05
Barracouta	28.7	0.13	7.2	0.03	6.3	0.03
Orange roughy	9.7	0.04	10.8	0.04	20.3	0.09
Spiky oreo	13.8	0.06	22.8	0.09	3.0	0.01
Warty squid	5.2	0.02	18.8	0.08	11.7	0.05
Long-nosed chimaera	10.4	0.05	15.4	0.06	6.6	0.03
Ghost shark	9.9	0.04	9.5	0.04	12.4	0.06
Seal shark	8.3	0.04	13.3	0.06	5.5	0.02
Smooth oreo	14.5	0.07	6.6	0.03	0.5	0.00
Red cod	12.2	0.06	4.9	0.02	3.1	0.01
Bluenose	5.5	0.03	3.0	0.01	7.1	0.03
Porbeagle shark	2.3	0.01	4.3	0.02	8.6	0.04
Gemfish	2.9	0.01	1.5	0.01	9.1	0.04
Longnose velvet dogfish	1.3	0.01	10.6	0.04	1.4	0.01
Rocks / stones	0.2	0.00	12.5	0.05	-	-
Scabbardfish	3.2	0.01	2.7	0.01	6.7	0.03
Leafscale gulper shark	1.0	0.00	9.2	0.04	2.3	0.01
Deepsea flathead	5.4	0.02	4.5	0.02	2.5	0.01
Oliver's rattail	-	-	5.9	0.02	5.9	0.03
Rudderfish	3.5	0.02	4.2	0.02	4.0	0.02
Banded bellowsfish	7.3	0.03	1.6	0.01	2.0	0.01
Silver dory	3.1	0.01	2.6	0.01	4.1	0.02
Deepwater dogfish (unspecified)	3.5	0.02	0.9	0.00	4.3	0.02
Lucifer dogfish	2.1	0.01	2.6	0.01	2.9	0.01
Others	60.2	0.26	96.8	0.39	51.7	0.22
Total	**21,946.6**		**24,226.0**		**22,393.8**	

Category 1: Key bycatch species[1]

The following QMS stocks are included in the hoki fisheries chapter:

- Silver warehou: SWA1, SWA3 and SWA4
- Frostfish: FRO3, FRO4, FRO5, FRO6, FRO7, FRO8, FRO9.
- Spiny dogfish: SPD3, SPD4, SPD5, SPD7 and SPD8
- White warehou: WWA3, WWA4, WWA5B, WWA7, WWA8 and WWA9
- Lookdown dory: LDO1 and LDO3

Management of these stocks will occur as part of the hoki fishery complex. A summary of the current status of each of these species is provided below. For more information on the biology of these species and their stock status please see the Ministry of Fisheries Plenary Report available at www.fish.govt.nz

Spiny dogfish, frostfish, white warehou and lookdown dory do not meet the >1% threshold but since the majority of the catch allocation for these species is taken as a bycatch in the hoki fishery it is appropriate to include these species in the hoki plan.

SILVER WAREHOU (SWA)

Biological Overview

Silver warehou are common around the South Island and on the Chatham Rise in depths of 200–800m. They grow rapidly and available information suggests they reach maturity at four years. Maximum age is estimated to be 23 years for females and 19 years for males.

Silver warehou is a schooling species, aggregating to both feed and spawn. During spring-summer, both adult and juvenile silver warehou migrate to feed along the continental slope off the east and southeast coast of the South Island. Juvenile silver warehou inhabit shallow water at depths of 150–200 m and remain apart from sexually mature fish. Few immature fish are consequently taken by trawlers targeting silver warehou. Once sexually mature, fish move out to deeper water along the shelf edge.

Fisheries Management Overview

The majority of the commercial catch is taken from the Chatham Rise, Canterbury Bight, southeast of Stewart Island and the west coast of the South Island. All three SWA stocks are caught as a bycatch in the hoki fishery; SWA1, SWA3 and SWA4.

SWA1

SWA1 is currently managed through an adaptive management programme (AMP).

Under current catch levels the stock is thought to be sustainable. While the TACC is double the current harvest level this likely reflects the decline in hoki effort following hoki TACC

[1] Note that some of the QMS bycatch stocks do not overlap with deepwater fishing activity and therefore are not included in this plan. These stocks will be managed through the appropriate inshore fisheries plan e.g. SPD1 and FRO1 & 2.

reductions, since SWA1 is an important bycatch in the WCSI hoki fishery. Catches did increase during the 2006–07 fishing year even though both the hoki TACC and subsequent fishing effort had reduced. It is possible that some operators targeted SWA1 because of the constraints on hoki fishing.

The current stock size is likely to be above the biomass that would support the maximum sustainable yield (B_{MSY}), as the average fishing mortality (F) over the last 10 years has been below natural mortality.

SWA3 & 4
There is little information available on the status of the SWA3 and SWA4 stocks. A characterisation study of both SWA stocks is currently in progress, but the results of this study are not yet finalised. The study will produce a descriptive analysis of the fishery which may enable an assessment of the current status of the stock to be made. If it is not possible to make this assessment then further research will be undertaken.

The management focus will be to ensure that over the five year time frame of the National Deepwater Plan there is sufficient information available to assess the performance of the stock against agreed management targets.

Economic overview

- 78% of silver warehou quota is held by four companies.
- In 2009 silver warehou earned over $22M in export revenues. The export figures do not distinguish between silver and white warehou and it is possible that some of this value could include white warehou exports.
- Silver warehou quota value was estimated to be $83M in 2009.

FROSTFISH (FRO)

Biological Overview

Frostfish are widely distributed throughout the continental shelf and upper slopes of all oceans, except the North Pacific. In New Zealand, frostfish are found from about 34° S to 49° S, but are most common between 36° S and 44° S. They occur mainly in depths of 50–600 m with the largest catches made at around 200m bottom depth. Preferred bottom temperatures range between 10–16° C. Frostfish reach a maximum length of 165 cm in New Zealand waters.

There is little information available on maturity and maximum age of frostfish in New Zealand. However studies of frostfish in the Mediterranean estimate that males reach sexual maturity at 97 cm and a maximum length of 176 cm, whilst females reach sexual maturity at 111 cm and a maximum length of 196 cm. Mediterranean frostfish also exhibit fast growth and attain a maximum age of 8 years.

Fisheries Management Overview

Frostfish is a low knowledge stock which was introduced into the QMS in 1998. Frostfish are predominantly taken as bycatch from target trawl fisheries on hoki and jack mackerel and to a lesser extent, arrow squid, barracouta and gemfish. Target fishing for frostfish is reported

from the west coast of both the South Island and North Island and at Puysegur Bank, with the best catches taken from the west coast of the South Island.

There is no information on the status of any of the frostfish stocks and it is not clear if catches are sustainable or if they are at a level that will move the stocks towards a size that will support the maximum sustainable yield.

A focus of this fisheries plan will be to ensure that over the five year time frame of the plan there is sufficient information available to assess the performance of the stock against agreed management targets.

There is also an issue that the current quota management area split does not reflect the true biological stock structure for frostfish. A priority focus for future management over the next five years will be to address this.

Economic overview

- 62% of frostfish quota is held by five companies.
- Frostfish does not feature on the export statistics but it is likely that the majority of frostfish is transhipped directly to Korea.
- Frostfish quota value was estimated to be $2.8M in 2009.

SPINY DOGFISH (SPD)

Biological overview

Spiny dogfish are widely distributed around the South Island and extend as far north as Manakau Harbour and East Cape on the west and east coasts of the North Island respectively. They are most abundant on the east coast of the South Island and the Stewart/Snares Shelf. They are found on the continental shelf and upper slopes down to a depth of at least 500 m, but are most common in depths of 50–150 m. Schools are strongly segregated by size and sex. The size of fish in the commercial fishery is not known but depends on the method of capture and area fished.

Spiny dogfish are born at a size of 18–30 cm in length. Males mature at 58 cm at age 6, and females mature at 73 cm at age 10. The maximum ages and lengths in a study of east coast South Island dogfish were 21 years and 90 cm for males, and 26 years and 111 cm TL for females.

Female spiny dogfish give birth to young over an extended period between April and September, mainly on the shelf edge in depths of 200–300 m. Mating also occurs in deeper water after which females move into shallower waters (of 100 m or less) where they remain for 12 months until the embryos are 15 cm long. They then return to deeper water. Parturition occurs after a gestation period approaching 24 months, and is closely followed by mating and ovulation and the biennial cycle is repeated.

The young spiny dogfish move inshore into shallower waters shortly after birth. Over the next few years they move steadily into deeper water but remain in size segregated schools

comprising up to 2 or 3 age classes. Once maturity is reached both males and females undergo inshore/offshore migrations associated with reproductive activity.

Spiny dogfish are found both on the bottom and in mid-water and feed on a very wide range of species, including krill, fish, squid, and crabs.

Fisheries Management Overview

Spiny dogfish was introduced to the QMS in 2004. It is currently listed in Schedule 6 and Schedule 6A of the Act which permits fishers to return spiny dogfish catch to sea (either alive or dead) provided that all catch is correctly reported and balanced with ACE or deemed values paid.

SPD is caught by both the inshore and deepwater fleet although the bulk of the catch is from deepwater trawlers. It is unusual for SPD to be targeted by the deepwater trawlers and most of the reported catch comes as incidental bycatch from the hoki, jack mackerel and squid fisheries. However, there is a commercially valuable inshore SPD fishery in the South Island and much of this inshore catch is exported.

It is unknown whether current catch limits are sustainable, but catches are routinely below the permitted TACC.

A focus of this fisheries plan will be to ensure that over the five-year period there is better information available to assess the current status of spiny dog fish against agreed management targets.

Other areas of research may include:

- Improving gear selectivity to reduce unwanted catches of SPD
- Assessing the appropriateness of retaining SPD within Schedule 6 and Schedule 6A of the Act.

Economic overview

- 60% of spiny dogfish quota is held by five companies.
- Spiny dogfish earned $2.5M in export revenues in 2009.
- The bulk of spiny dogfish that is caught by deepwater trawlers is mealed or discarded under the Schedule 6 and 6A of the Fisheries Act 1996.
- Spiny dogfish quota value was estimated to be $6.1M in 2009.

WHITE WAREHOU (WWA)

Biological Overview

Adult white warehou range between 40–60 cm in length and reach a maximum length and weight of 67 cm and 5.7 kg respectively. Sexual maturity is reached at an age of about 3 or 4 years at a length of approximately 38–47 cm. The maximum age of white warehou is uncertain but is believed to be greater than 12 years.

Fisheries Management Overview

WWA is predominantly taken as a bycatch in the hoki trawl fishery particularly on the Chatham Rise (WWA3, 4 & 5B). There is little information currently available on the status of any of the white warehou stocks and it is not known if catches are sustainable or if they are at levels that will allow the stock to move towards a size that will support the maximum sustainable yield.

The management focus will be to ensure that over the five-year period there is sufficient information available to assess the performance of the stock against agreed management targets.

Economic overview

- 65% of white warehou quota is held by six companies.
- White warehou does not feature on the export statistics but it is possible that exports are included under silver warehou
- White warehou quota value was estimated to be $16.8M in 2009.

LOOKDOWN DORY (LDO)

Biological Overview

Lookdown dory are widely distributed throughout New Zealand waters but are particularly prevalent on the Chatham Rise. Adult lookdown dory are more commonly found in depths between 400-600m but have a wide depth range from 50 – 1200m.

Trawl survey catch data estimates female LDO grow to 55cm in length while males are estimated to grow to 40cm. Maturity is estimated to occur at 35cm. Although there are no published studies of age and growth of lookdown dory, preliminary studies from Australia suggest the species may live up to 30 years.

It is likely to be a prey of larger fish and it has occasionally been recorded in the stomachs of large ling.

Fisheries Management Overview

Lookdown dory was introduced to the QMS in 2004 with two main QMAs; LDO1 and LDO3. The largest fishery is LDO3 which accounts for 80% of the catch limit.

LDO is predominantly (83%) taken as a bycatch in the hoki trawl fishery particularly on the Chatham Rise (LDO3). It is normally fished at depths of 200-800m. LDO3 catches have declined since the species was introduced to the QMS and on average only half of the combined TACC has been harvested since 2004. However, the LDO1 fishery which has a TACC of 180 tonnes has been overfished on two occasions since 2004.

There are no known sustainability concerns in the LDO fishery, although it is not known if catches are sustainable or if they are at levels that will allow the stock to move towards a size that will support the maximum sustainable yield.

The management focus will be to ensure that over the five-year period there is sufficient information available to assess the performance of the stock against agreed management targets.

Economic overview

- Over 60% of the LDO quota is held by four companies.
- Lookdown dory is primarily sold on the domestic market and does not feature in the export statistics.
- Lookdown dory quota value was estimated to be $0.9M in 2009.

Category 2: Incidental bycatch species

These are typically species with little or no commercial value, which are not the focus of fishing effort and are frequently discarded, although all catch must be recorded on landing returns. Catch levels will continue to be monitored annually by observers. If there are concerns that harvest levels are thought to be impacting on the sustainability of the species or if there are utilisation concerns then some form of management intervention may be necessary. This could include section 11 measures or the species being assessed for possible QMS introduction.

The QMS Introduction Standard requires MFish to carry out an annual process to determine what stocks or species may be considered by the Minister of Fisheries for introduction into the QMS. The first step of the process is to identify candidate species or stocks. Stocks or species are considered are considered to be a candidate if they meet one of six criteria. Key criteria include variation in catch of a stock or where there is information to suggest a sustainability or utilisation concern exists.

Further, through the 10 Year Research Programme a Level 1 Risk Assessment for these incidental bycatch species is scheduled for completion during 2011 – 2012.

Category 3: Incidental captures of ETP species

As described previously, the hoki fishery interacts with a range of seabird species, marine mammals (particularly fur seals) and with some species of protected shark. The Fisheries Act requires that when an environmental impact results in an adverse effect this effect should be avoided, remedied or mitigated.

Table 3 below describes the extent of the interactions with seabirds and marine mammals from observed vessels over the last five complete fishing years for which information is available (up to 2007-08).

Table 3: Extent of observed interactions with seabirds and marine mammals from the hoki trawl fishery (2002/03 to 2007/08)[2]

Year	No. Observed captures		% tows observed
	Seabirds	Marine Mammals	
2007/08	30	59	21.3
2006/07	23	29	16.5
2005/06	54	62	15.3
2004/05	46	122	14.7
2003/04	33	49	10.4
2002/03	84	45	9.3

Table 4 below provides species specific information on captures for the last two complete fishing years for which information is available (2006-07 and 2007-08).

[2] "Capture of protected species in New Zealand's trawl and longline fisheries 1998–99 to 2007–08" Dragonfly.

Table 4: Summary of observed seabird and marine mammal captures by dominant species for the last two complete fishing years where information is available[3]
WCSI= west coast south island; CR= Chatham rise; SubA= sub-Antarctic; CS= Cook strait.

	2007/08					2006/07				
Seabirds	**WCSI**	**CR**	**SubA**	**CS**	**Total**	**WCSI**	**CR**	**SubA**	**CS**	**Total**
Sooty shearwater (*Puffinus griseus*)		2	1				7	2		9
Salvin's albatross[4] (*Thalassarche salvini*)							5			5
White-capped albatross (*Thalassarche steadi*)		2				2				2
White-chinned petrel (*Procellaria aequinoctialis*)		5	3				1	1		2
Cape pigeon (*Daption spp.*)						1				1
Northern giant petrel (*Macronectes giganteus*)						1				1
Giant petrels (unidentified)						1				1
Buller's albatross (*Thalassarche bulleri*)	10	2	1			1				1
Grey backed storm petrel (*Garrodia nereis*)										
Southern cape pigeon (*Daption capense*)						1				1
Albatross (unidentified)										
Other birds[5]	1	3								
Total	**11**	**14**	**5**		**30**	**7**	**13**	**3**	**0**	**23**
Marine mammals										
Fur seals	23	7	4	24	**58**	0	4	2	23	**29**
New Zealand sea lion			1		**1**					**0**

Seabirds

Seabirds are killed or injured by trawl gear because they are either struck by the trawl warps (notably larger seabirds such as albatross) or caught in the net when it is on the surface during deployment and retrieval (notably smaller seabirds such as shearwaters and petrels). Table 3 provides information on observed captures and estimated total seabird captures from 2002-03 to 2007-08. Regulations were passed in 2005 that require trawl vessels to deploy bird mitigation devices, such as tori lines, to scare birds away from the danger zone around the stern of the vessel. These mitigation measures have been successful in reducing the number of warp interactions and there has been a noticeable decline in the number of

[3] Ibid.

[4] These species are members of the same family as the great albatrosses (*Diomedeidae*), but belong to a distinct genus of Mollymawks (*Thalassarche*).

[5] Unidentified petrel (1), flesh-footed shearwater (1)

fatal interactions of large sea birds since these measures were first introduced.[6] However, there is still the outstanding issue of incidental seabird mortalities through net captures and cryptic mortalities which must be addressed.

In addition to the mandatory mitigation measures, industry and the Ministry work collaboratively to ensure all trawlers over 28 metres in length have, and follow, a Vessel Management Plan (VMP). VMPs specify the measures that must be followed onboard the vessel so as to reduce the risk of incidental seabird captures. These measures include storing offal while shooting and hauling fishing gear, and making sure all fish are removed from the net before it is put back in the water. The Ministry monitors vessel performance against these VMPs. If a vessel is not complying with its VMP then the Chief Executive of the Ministry of Fisheries has the option of putting vessel-specific regulations in place to better control offal management practices.

Work is currently underway to develop an environmental standard for seabirds, which will apply across all fisheries. Once this standard is in place, the performance of vessels operating in the hoki fishery will be assessed annually. If the extent of hoki fishing activity means that the standard is not being met then further management intervention, including increased mitigation, will likely be required

Table 5: Observed and predicted seabird interactions from vessels targeting hoki 2002/03 to 2007/08.

Year	Observed captures	% tows observed	Estimated total captures	Strike rate based on observer data	Model-based estimate
2007/08	28	21.3	128	1.50	Data not yet available
2006/07	23	16.6	138	1.31	Data not yet available
2005/06	54	15.3	369	3.04	412
2004/05	47	14.7	277	2.16	444
2003/04	42	10.4	371	1.41	540
2002/03	84	9.3	820	3.24	Data not produced

Marine mammals

New Zealand fur seals are the most common marine mammal interaction in the hoki trawl fishery. Table 6 provides information on observed captures and estimated total marine mammal captures from 2002-03 to 2007-08. Although the fur seal is a protected species

[6] The seabird warp strike rate has declined from 4.22 seabirds for every 100 tows to 2 seabirds for every 100 tows between the period 1999-2002 to 2005-2008. Mandatory mitigation measures were implemented in 2005. Capture of protected species in New Zealand's trawl and longline fisheries 1998–99 to 2007–08" Dragonfly.

under the Marine Mammal Protection Act 1978, the species status has been classified by the Department of Conservation as not threatened by extinction. In addition the fur seal population has been expanding around the coast of New Zealand in the last twenty to thirty years. The majority of the fur seal interactions in the hoki fishery occur in two key areas, the Cook Strait and the West Coast South Island (see Table 4) above.

However, there are concerns, based on unpublished data from three fur seal rookeries on the WCSI that the fur seal population is in decline in these areas. The absence of published trend information has made it difficult to verify this concern and to assess if and why fur seals may be declining in this part of New Zealand when fur seal populations elsewhere are expanding.

In January 2009 a joint industry, Department of Conservation and Ministry of Fisheries research project was contracted to complete a census of the fur seal population across the entire WCSI. The purpose of this project was to provide a point-in-time estimate of the minimum population size for the fur seal population on the WCSI. The results of the survey will be used to inform future management measures to ensure that hoki fishing activity on the WCSI does not have an adverse effect on the fur seal population.

There is not currently an environmental standard in place for fur seals, nor is there definitive information on the likely impact of incidental fishing related captures on the fur seal population. In the absence of this information the appropriate management response is to continue to:

- encourage vessel operators to alter fishing practices so as to reduce any residual risk to the fur seal population from fishing activity; and
- monitor captures via the observer programme.

The industry-developed marine mammal operating procedure (MMOP) is the tool currently used to encourage changes in fishing practices. The MMOP describes a range of procedures that a vessel (and crew) should follow so as to reduce the risk of marine mammal captures. These measures include managing offal discharge and refraining from shooting and hauling the gear when fur seals are congregating around the vessel. The Ministry monitors and audits vessel performance against this procedure. As part of the operational objectives specified in this National Deepwater Plan, the performance of the fishery against the MMOP will be reported on in the Annual Review Report.

It is also important that fur seal interactions in the hoki fishery are assessed and managed in the context of total fur seal interactions from other fisheries, such as the hake fishery on the WCSI and the southern blue whiting fishery in the Sub-Antarctic.

Sea lion captures have been recorded in the hoki trawl fishery in the past, but since 1999 only two sea lion captures have been reported from observed vessels, of which one was released alive. No common dolphin captures have been recorded from observed trawls in the hoki fishery. Marine mammal interactions other than fur seal captures appear to be a rare event and therefore the effects of hoki fishing activity on these species is unlikely to be determined adverse.

Table 6: Observed and predicted fur seal interactions from vessels targeting hoki 2002/03 to 2008/09.

Year	Observed captures	Estimated total captures	% tows observed	Strike rate based on observer data	Predicted captures (model-based)
2008/09	37	264	20.3	2.23	Data not available
2007/08	58	326	21.3	3.10	Data not available
2006/07	29	246	16.5	1.65	Data not available
2005/06	62	215	15.3	3.49	471
2004/05	120	1,033	14.7	5.63	625
2003/04	49	404	10.4	2.09	411
2002/03	44	453	9.3	1.70	505

Sharks (Elasmobranchs)

The hoki fishery is also known to interact with shark species, particularly basking sharks. However, the information on the nature and extent of these interactions is incomplete. A key objective of the National Deepwater Plan will be to improve monitoring and information collection on the nature and extent of protected shark species interactions across all deepwater fisheries. If the results of this monitoring indicate that further research into particular shark species is needed then this research will be delivered through the 10 Year Research Programme as required.

For the purposes of this plan, protected shark species are those that are either protected under New Zealand law or are shark species for which New Zealand has international obligations to ensure that fishing activity does not have an adverse effect on their population. The following shark species are currently included in this category:

Table 7: Protected shark species

	Protection	
Species	**International Obligations**	**Domestic Law**
Great white shark	✓	✓
Basking shark	✓	X
Whale shark	✓	X
Deepwater nurse shark		✓

Note that basking sharks are currently in the process of becoming protected

Porbeagle shark and school shark are also currently listed on the International Union for Conservation of Nature (IUCN) threatened species list because of sustainability concerns for these species in other jurisdictions. In New Zealand these species are managed through the QMS. In addition, these species have not featured in the list of bycatch species caught in

hoki target trawls in recent years, although there has been some historical evidence that they can be a bycatch.

Available information on the extent of protected shark species captures from observed hoki vessels is presented in Table 8 below.

Table 8: Summary of captures of 'protected' shark species 2003-04 to 2008-09

Species	Fishing year						
	2003 / 2004	2004 / 2005	2005 / 2006	2006 / 2007	2007 / 2008	2008 / 2009	Total
Great white shark	0	0	0	0	0	0	0
Basking shark	12	2	2	1	5	0	22
Whale shark	0	0	0	0	0	0	0
Deepwater nurse shark	0	0	0	0	0	0	0

There are currently no specific management measures in place in the hoki fishery to avoid, remedy or mitigate incidental captures of protected shark species. However, in 2008 the Minister of Fisheries approved the National Plan of Action (NPOA) sharks which establish a range of actions to ensure that fisheries management in New Zealand satisfies the objectives of the IPOA-Sharks[7] to ensure the conservation and management of sharks and their long-term sustainable use. The NPOA focuses on a series of management actions to enable us to meet our international obligations with respect to the management of shark interactions. These actions focus on four broad areas:

- Eliminate live shark finning
- Ensure appropriate management of threatened and endangered species
- Review of shark management
- Improve information on shark captures

Measures that will relate to the hoki fishery include the protection of basking shark under the Wildlife Act 1953 and the Fisheries Act 1996. The basking shark protection is scheduled to come into force in December 2010.

Protected coral species

A recent change to the Wildlife Act 1953 means that most hard coral species are now protected under that Act. During the last three fishing years observers reported less than 400 kg of corals being taken in hoki target trawls (see Table 9).

Approximately 15% of the total was either not protected species or was coral reported under generic reporting codes, which means it was not possible to confirm whether it was a protected species or not. Almost 85% of the reported coral bycatch were species protected under the Wildlife Act.

[7] International Plan of Action for Sharks

Category 4: Benthic interactions

Hoki is caught by both mid-water trawl gear and bottom trawl gear with the bottom trawl fishery being predominantly on the Chatham Rise and Sub-Antarctic fishing grounds. Table 9 below details the benthic bycatch that has been recorded from observed vessels over the past three fishing years. Generally benthic bycatch is small and typically only amounts to a few kilograms. The exception to this is the 17 tonnes of sponges that have been recorded.

MFish acknowledges that bycatch data does not provide information on the nature and extent of benthic interactions from hoki trawl activity.

Table 9: Benthic bycatch from hoki target tows from Observer records for 2006-07 to 2008-09 fishing years

Category	Species code	Common name	Protected species (corals only)	Total amount recorded (kg)
Corals	CBD	Coral rubble - dead	N/a	45
	COF	Flabellum cup corals	Yes	230
	COR	Hydrocorals	Yes	7
	COU	Coral (unidentified)	N/a	5
	EPZ	Epizoanthus sp.	No	2
	LLE	Bamboo coral	Yes	2
	STS	*Stephanocyathus spiniger*	Yes	71
	STP	Solitary bowl coral	Yes	4
	THO	Bottlebrush coral	Yes	6
	TLO	Long polyp soft corals	No	4
			Total	**376**
Sponges	ANZ	Knobbly sandpaper sponge		1
	CRM	Airy finger sponge		15
	HYA	Floppy tubular sponge		7,600
	GLS	Glass sponges		2,461
	ONG	Sponges		6,906
	SUA	Fleshy club sponge		7
			Total	**16,990**

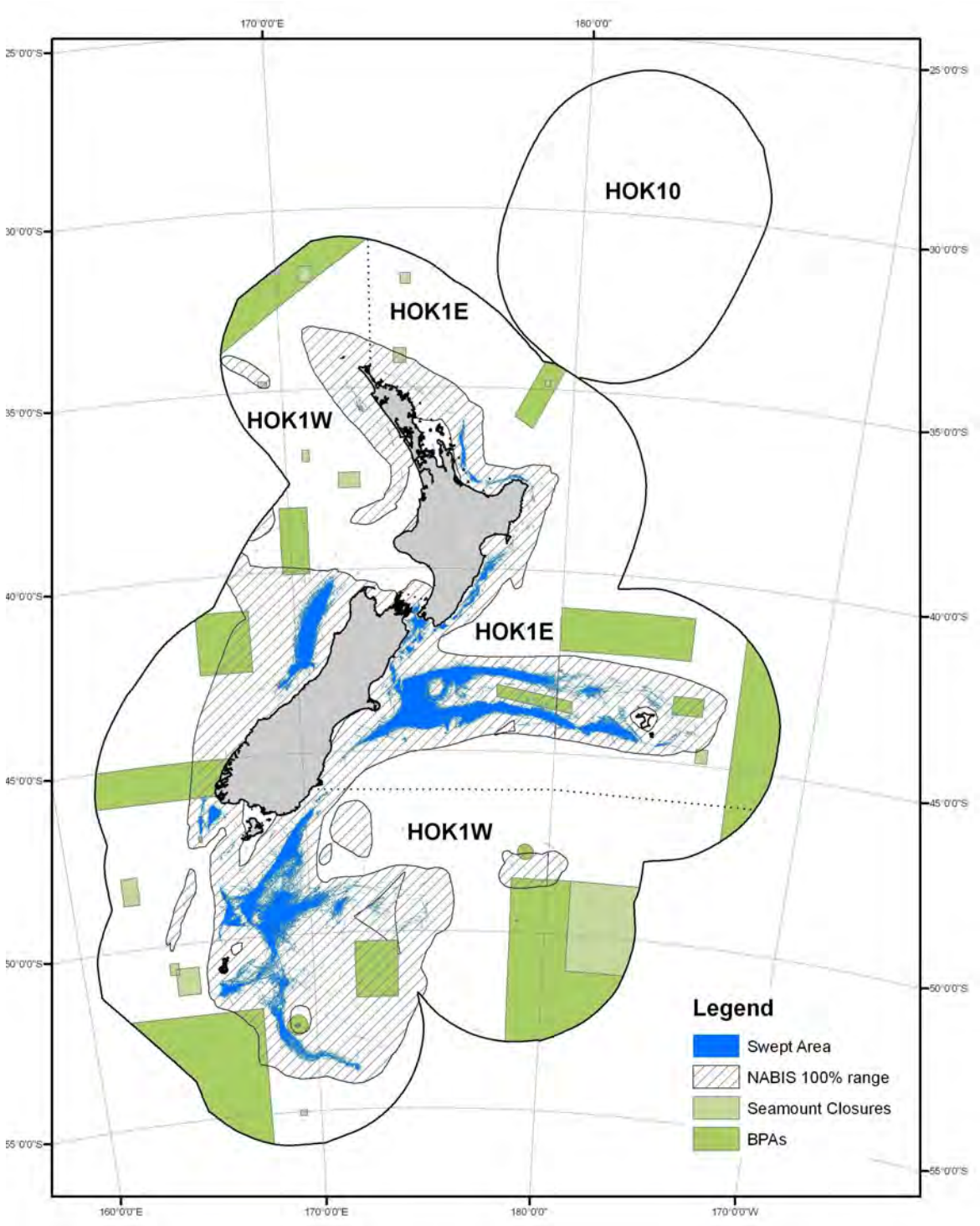
In recent years the management measures to address the effects of deepwater trawl activity have focused on 'avoiding' these effects rather than remedying or mitigating them (as per the requirements under the Fisheries Act to avoid, remedy or mitigate). This has been achieved by closing areas to bottom trawling; first with seamounts and then with Benthic Protection Areas (BPAs). The implementation of BPAs in 2007 effectively closed over 30% of the New Zealand EEZ to bottom trawling. MFish also implemented a monitoring regime to ensure these closures were adhered to. The BPA closures were based on the best available marine classification and over 10% of each environment class was closed.[8]

The current BPAs will be reviewed after 2013 and if research suggests that the existing BPAs are not protecting a representative section of marine habitats then further closures will be

[8] The exception was environment class 55, where only 3% was closed, because a third of this area is included in the Territorial Sea and most bottom trawling in that area is for coastal rather than deepwater species.

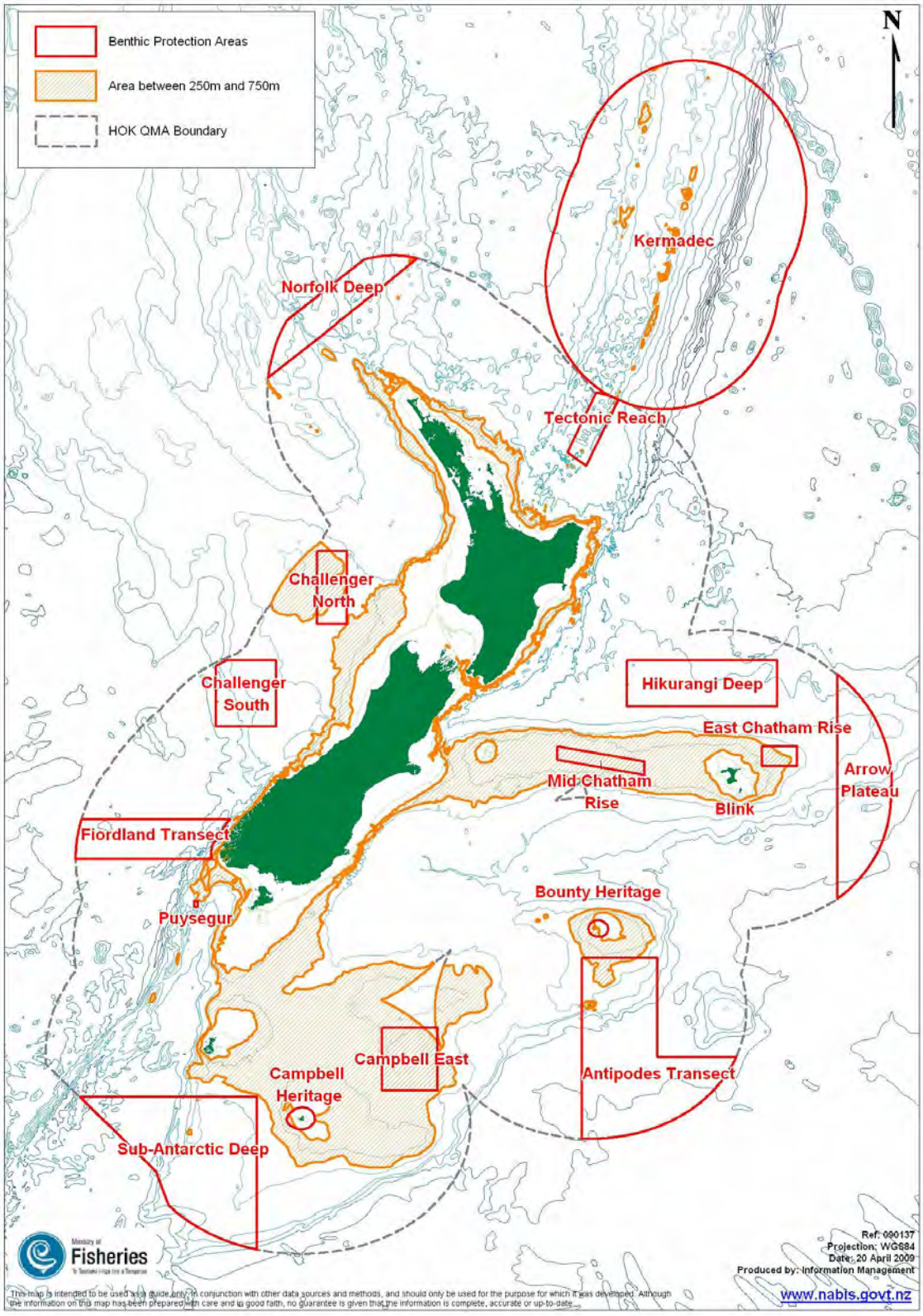
considered.[9] The maps below detail the BPAs and also include details of the hoki habitat depth range.

Map 2: Hoki bottom trawl footprint 1989-1990 to 2007-2008 (note trawl tracks are not to scale)



[9] Some eNGOs do not consider that the Benthic Protected Area adequately address the benthic interactions that arise from hoki and other deepwater trawl interactions.

Map 3: The proportion of hoki habitat currently closed to bottom trawling activity through the BPAs



3. Operational Objectives for the hoki fishery

This part of the plan describes the operational objectives that will drive the management of the hoki fishery for the next five years. The table below details each operational objective and indicates which management objectives it contributes to, recognising that the successful delivery of one operational objective may contribute to the delivery of more than one management objective.

Operational objectives are specific, measurable and time bound. The actions (and services) required to meet these operational objectives will be specified each year in the Annual Operational Plan.

Table 10: Details of the operational objectives (OO) for the hoki fishery and link with management objectives

- ●● Denotes the primary management objective that each operational objective contributes to achieving
- ● Denotes additional management objectives that each operational objective contributes to achieving

Utilisation focused Operational Objectives	MO 1.1	MO 1.2	MO 1.3	MO 1.4	MO 1.5	MO 1.6	MO 1.7	MO 2.1	MO 2.2	MO 2.3	MO 2.4	MO 2.5	MO 2.6	MO 2.7
OO1.1 Support the hoki fishery in maintaining MSC certification and achieving recertification after 2012	●●					●								
OO1.2 Enable quota owners to develop and implement a harvest regime to maximise economic yield from the hoki fishery which is aligned with the harvest strategy by 2011	●●							●	●					
OO 1.3 Ensure management measures and controls are assessed in terms of their contribution to the value of the hoki fishery before implementation from 2011	●●						●							
OO1.4 Establish an open, transparent and inclusive management environment through: (1) ensuring all management information is available and easily accessible by all; and (2) collaboratively engaging with stakeholders on the management of the fishery by 2011		●●		●●		●●	●							
OO1.5 Ensure that all research used to inform the management		●			●●				●	●				

Utilisation focused Operational Objectives	MO 1.1	MO 1.2	MO 1.3	MO 1.4	MO 1.5	MO 1.6	MO 1.7	MO 2.1	MO 2.2	MO 2.3	MO 2.4	MO 2.5	MO 2.6	MO 2.7
of the hoki fishery continues to be peer reviewed and meets the requirements of the research standard														
OO1.6 Ensure sufficient and appropriate data is routinely collected from the hoki fishery and key bycatch stocks to meet the requirements of the operational objectives specified in this plan from 2011		●			●●				●	●				
OO1.7 Create an 'information hub' where all information on the management of the hoki fishery is available and easily accessible by all from 2010		●				●●								
OO1.8 Explore options to assess the management of the hoki fishery against international best practice standards and guidelines by 2011					●●									
OO1.9 Monitor levels of fisher compliance in the hoki fishery annually against a set of agreed compliance standards and benchmarks, from 2010					●●	●●							●	
OO1.10 Ensure appropriate and transparent action is taken when compliance levels in the hoki fishery fall below the agreed benchmarks, from 2011					●●	●●							●	
OO1.11 Facilitate greater commercial iwi involvement in the management of the hoki fishery through the DeepWater Group Ltd from 2010		●					●●							
OO1.12 Utilise the collaborative relationships currently established between the Ministry of Fisheries and iwi groups to ensure iwi have the opportunity to effectively input and participate in the management of the hoki fishery from 2010		●					●●							

Environmental focused Operational Objectives	MO 1.1	MO 1.2	MO 1.3	MO 1.4	MO 1.5	MO 1.6	MO 1.7	MO 2.1	MO 2.2	MO 2.3	MO 2.4	MO 2.5	MO 2.6	MO 2.7
OO2.1 Develop an agreed harvest strategy for the hoki fishery that includes a rebuild strategy and is consistent with the Harvest Strategy Standard by end of 2010		●				●		●●	●					
OO2.2 Ensure that the total harvest of hoki and key bycatch species is balanced against ACE and that overcatch of the TACC is minimised		●				●		●	●●				●	
OO2.3 Annually assess status of the hoki stocks and manage harvest levels in line with the harvest strategy from 2011		●				●		●●						
OO2.4 Develop and implement an agreed harvest strategy (consistent with the Harvest Strategy Standard) for key QMS bycatch stocks managed through this plan from 2011		●				●		●●	●					
OO2.5 Implement an effective annual in-season management regime to support the delivery of the harvest strategies for hoki (from 2010) and key bycatch stocks (post 2011)						●		●●	●					
OO2.6 Complete an Ecological Risk Assessment (ERA) to assess the level of risk from hoki fishing activity to non-fish species, including ETP species, by 2010	●			●						●●	●●	●●	●●	●●
OO2.7 Determine additional management measures required to mitigate adverse effects on non-fish species, including ETP species, identified through the ERA by 2011										●●	●●	●●	●●	●●
OO2.8 Define what is meant by 'habitats of particular significance for fisheries management purposes' for the hoki fishery by 2010; identify the range of habitats that are significant, and review current levels of protection by 2013									●●					
OO2.9 Identify what further levels of habitat protection are required to be implemented by 2013									●●	●	●	●	●	●
OO2.10 Ensure that incidental seabird mortalities in the hoki fishery are avoided and minimised to acceptable levels (which												●●		

Environmental focused Operational Objectives	MO 1.1	MO 1.2	MO 1.3	MO 1.4	MO 1.5	MO 1.6	MO 1.7	MO 2.1	MO 2.2	MO 2.3	MO 2.4	MO 2.5	MO 2.6	MO 2.7
may include standards) by 2011														
OO2.11 Ensure that incidental marine mammal captures in the hoki fishery are avoided and minimised to acceptable levels (which may include standards) by 2012												●●		
OO2.12 Ensure that the incidental capture of endangered and protected shark captures in the hoki fishery are avoided and minimised to acceptable levels (which may include agreed standards) by 2013												●●		
OO2.13 Implement measures to monitor and improve vessel at-sea performance in terms of environmental interactions from 2010		●●				●					●	●	●	●
OO2.14 Monitor trends in captures of incidental bycatch species in the hoki fishery from 2010											●●			
OO2.15 Implement appropriate spatial management measures to address the impact that hoki bottom trawl fishing activity has on the benthic habitat, post 2013														

4. Measuring performance

Why measure performance? Monitoring and measuring performance is critical to ensure operational objectives are achieving the management objectives, the Fisheries 2030 supporting outcomes and in turn the overall strategic vision for the fisheries sector.

This section describes:

- The review criteria that will be used to assess performance against the management objectives for the hoki fishery specifically. These review criteria provide a gap analysis for the management of the hoki fishery as they specify the current status of the fishery and the expected target status after five years of the National Deepwater Plan driving management.

- The performance indicators that will be used to determine if the operational objectives have been met.

Management Objectives: Review criteria

Review criteria enable the measurement of where we are now compared with where we will be in 5 years time, i.e. how the management of the hoki fishery has improved over the five years of the National Deepwater Plan. Review criteria allow us to demonstrate that, through the implementation of the operational objectives specified in this hoki chapter, clear and definite progress has been made towards meeting a management objective.

The nature of some of these management objectives means it may not be feasible to fully meet the targeted outcome within the five-year life span of this plan.

Each of the management objectives is assessed below in terms of its current status in the hoki fishery and the target status after the fisheries plan has been in place for five years.

Management Objectives - Utilisation

MO1.1	**Enable an economically viable hoki fishery in New Zealand over the long term**
Status at start of plan	○ Current hoki quota value is $730M (2008) ○ Current hoki cost recovery levies are approximately $7M ○ Current hoki export earnings are $151M (2008)
Target status at 5 year review	○ The real value of hoki quota is increased ○ Management decisions are formally assessed in terms of their value contribution prior to being implemented ○ Information necessary to manage fisheries is transparently obtained on a cost-effective basis
Supporting operational objectives	
OO1.1	Support the hoki fishery in maintaining MSC certification and achieving recertification after 2012
OO1.2	Enable quota owners to develop and implement a harvest regime to maximise economic yield from the hoki fishery which is aligned with the harvest strategy, by 2011
OO1.3	Ensure management measures and controls are assessed in terms of their contribution to the value of the hoki fishery before implementation from

	2011
OO2.6	Complete an Ecological Risk Assessment (ERA) to assess the level of risk from hoki fishing activity to non-fish species, including ETP species, by 2010

MO1.2	**Ensure there is consistency and certainty of management measures and processes in the hoki fishery**
Status at start of plan	○ The hoki fishery is managed by the Ministry of Fisheries in collaboration with the Deepwater Group Ltd (DWG), which represents 95% of the hoki quota owners ○ There is currently no fisheries plan in place that sets out the management objectives to guide the management of the fishery ○ Key management decisions are consulted on widely across all stakeholder groups with an interest in the fishery ○ Few management decisions are assessed in terms of the value they contribute to quota owners and New Zealand ○ Catch is monitored annually against the TACC and against the catch split arrangement ○ There is limited information available on the extent of fisher compliance in the hoki fishery ○ There has been improved environmental performance in recent years but there are still areas to work on particularly around protected shark bycatch ○ There is currently no single information source that can be accessed by people with an interest in the management of the hoki fishery
Target status at 5 year review	○ Wide support and compliance with both regulatory and non-regulatory management measures in place in the fishery ○ Collaborative management relationship continues with greater benefits realised ○ Regular internal and external consultation and review processes continued ○ Evidence of good levels of compliance in the hoki fishery, as illustrated by performance against compliance standards. ○ Management measures and decisions are documented and are publicly available on the MFish website. ○ Management decisions are formally assessed in terms of their value contribution prior to being implemented.
Supporting operational objectives	
OO1.4	Establish an open, transparent and inclusive management environment through: (1) ensuring all management information is available and easily accessible by all; and (2) collaboratively engaging with stakeholders on the management of the fishery by 2011
OO1.5	Ensure that all research used to inform the management of the hoki fishery continues to be peer reviewed and meets the requirements of the research standard
OO1.6	Ensure sufficient and appropriate data is routinely collected from the hoki fishery and key bycatch stocks to meet the requirements of the operational objectives specified in this plan from 2011
OO1.7	Create an 'information hub' where all information on the management of the hoki fishery is available and easily accessible by all from 2010

OO1.11	Facilitate greater commercial iwi involvement in the management of the hoki fishery through the DeepWater Group Ltd from 2010
OO1.12	Utilise the collaborative relationships currently established between the Ministry of Fisheries and iwi groups to ensure iwi have the opportunity to effectively input and participate in the management of the hoki fishery from 2010
OO2.1	Develop an agreed harvest strategy for the hoki fishery that includes a rebuild strategy and is consistent with the Harvest Strategy Standard by end of 2010
OO2.2	Ensure that the total harvest of hoki and key bycatch species is balanced against ACE and that overcatch of the TACC is minimised
OO2.3	Annually assess status of the hoki stocks and manage harvest levels in line with the harvest strategy from 2011
OO2.4	Develop and implement an agreed harvest strategy (consistent with the Harvest Strategy Standard) for key QMS bycatch stocks managed through this plan from 2011
OO2.13	Implement measures to monitor and improve vessel at-sea performance in terms of environmental interactions from 2010

MO1.3	**Ensure the hoki fishery resource is managed so as to provide for the reasonably foreseeable needs of future generations**
Status at start of plan	○ The foreseeable needs of future generations, including intrinsic and bequest values, have not specifically been identified in relation to hoki ○ Current management is focussed on meeting agreed catch limits and avoiding, remedying or mitigating the adverse effects of fishing on the aquatic environment
Target status at 5 year review	○ Through the delivery of the National Deepwater Plan there is a greater public awareness and understanding of how the hoki fishery is managed ○ There is wider public acknowledgement that the hoki fishery is well managed ○ Hoki fisheries are managed so that they are capable of achieving third party certification, if required
Supporting operational objectives	
	Note that all operational and management objectives contribute to the delivery of MO1.3

MO1.4	**Ensure effective management of the hoki fishery is achieved through the availability of appropriate, accurate and robust information**
Status at start of plan	Current management of the hoki fishery is supported by a robust and comprehensive stock assessment programme. However there is insufficient data and information available to assess the status of bycatch stocks or to fully assess the nature and extent of adverse environmental effects
Target status at 5 year review	○ The 10 Year Research Programme is implemented and the data necessary to support the objectives in the National Deepwater Plan is routinely collected in a cost-effective manner ○ The delivery of management and operational objectives detailed in

	this fisheries plan is supported by the appropriate research ○ All research used to inform management decisions continue to meet MFish standards and peer review requirements
Supporting operational objectives	
OO1.4	Establish an open, transparent and inclusive management environment through: (1) ensuring all management information is available and easily accessible by all; and (2) collaboratively engaging with stakeholders on the management of the fishery by 2011
OO2.6	Complete an Ecological Risk Assessment (ERA) to assess the level of risk from hoki fishing activity to non-fish species, including ETP species, by 2010

MO1.5	**Ensure that the management of New Zealand's hoki fishery is recognised as being consistent with or exceeding domestic and international best practice**
Status at start of plan	○ Hoki fishery is currently certified by the Marine Stewardship Council as being sustainably managed ○ Poor public perception of the status of the fishery
Target status at 5 year review	○ Independent third party certification of the hoki fishery is retained. ○ MSC- identified Conditions of Certification are met ○ Levels of compliance in the hoki fishery are monitored annually against a set of agreed compliance benchmarks and performance of the fishery exceeds these benchmarks ○ Public acknowledgement that the hoki fishery is well managed and is consistent with or exceeds best practice
Supporting operational objectives	
OO1.5	Ensure that all research used to inform the management of the hoki fishery continues to be peer reviewed and meets the requirement of the research standard
OO1.6	Ensure sufficient and appropriate data is routinely collected from the hoki fishery and key bycatch stocks to meet the requirements of the operational objectives specified in this plan from 2011
OO1.8	Explore options to assess the management of the hoki fishery against international best practice standards and guidelines by 2011
OO1.9	Monitor levels of fisher compliance in the hoki fishery annually against a set of agreed compliance standards and benchmarks, from 2010
OO1.10	Ensure appropriate and transparent action is taken when compliance levels in the hoki fishery fall below the agreed benchmarks, from 2011

MO1.6	**Ensure New Zealand's hoki fishery is transparently managed**
Status at start of plan	○ Information currently available on the management of the hoki fishery consists predominantly of scientific and technical reports which are only accessible to a limited audience ○ There is currently no primary information source that can be accessed by all people with an interest in the management of the hoki fishery
Target status at 5 year review	○ The Ministry of Fisheries website is acknowledged as the most comprehensive source of information (both technical and "plain English") on the management and performance of the hoki fishery ○ Annual Operational Plan for the hoki fishery describes management

	procedures for the upcoming fishing year ○ Annual Review Report describing the performance of the fishery in the previous year is produced and made publicly available ○ There is greater public/media awareness and understanding of how the hoki fishery is managed
Supporting operational objectives	
OO1.1	Support the hoki fishery in maintaining MSC certification and achieving recertification after 2012
OO1.4	Establish an open, transparent and inclusive management environment through: (1) ensuring all management information is available and easily accessible by all; and (2) collaboratively engaging with stakeholders on the management of the fishery by 2011
OO1.7	Create an 'information hub' where all information on the management of the hoki fishery is available and easily accessible by all from 2010
OO1.9	Monitor levels of fisher compliance in the hoki fishery annually against a set of agreed compliance standards and benchmarks, from 2010
OO1.10	Ensure appropriate and transparent action is taken when compliance levels in the hoki fishery fall below the agreed benchmarks, from 2011
OO2.1	Develop an agreed harvest strategy for the hoki fishery that includes a rebuild strategy and is consistent with the Harvest Strategy Standard by end of 2010
OO2.2	Ensure that the total harvest of hoki and key bycatch species is balanced against ACE and that overcatch of the TACC is minimised
OO2.3	Annually assess status of the hoki stocks and manage harvest levels in line with the harvest strategy from 2011
OO2.4	Develop and implement an agreed harvest strategy (consistent with the Harvest Strategy Standard) for key QMS bycatch stocks managed through this plan from 2011
OO2.5	Implement an effective annual in-season management regime to support the delivery of the harvest strategies for hoki (by 2010) and key bycatch stocks (post 2011)
OO2.13	Implement measures to monitor and improve vessel at-sea performance in terms of environmental interactions from 2010

MO1.7	**Ensure the management of New Zealand's hoki fishery fully meets the Crown's obligations to Maori under the fisheries settlement Acts**
Status at start of plan	Iwi quota owners are not actively represented in the management of the hoki fishery and there are concerns that some iwi groups may not be fully aware of the link between the hoki management regime and the long term value of their quota asset
Target status at 5 year review	○ Iwi with an interest in the hoki fishery have the opportunity to be actively engaged in the management of the fishery. ○ Iwi membership of the DWG has increased ○ Clear processes in place to allow TOKM to represent commercial iwi views where necessary ○ Iwi with a commercial interest in the hoki fishery are enjoying the benefits of responsible asset management ○ Mechanism for wider iwi engagement is through the relevant iwi forum

Supporting operational objectives	
OO1.3	Ensure management measures and controls are assessed in terms of their contribution to the value of the hoki fishery before implementation from 2011
OO1.4	Establish an open, transparent and inclusive management environment through: (1) ensuring all management information is available and easily accessible by all; and (2) collaboratively engaging with stakeholders on the management of the fishery by 2011
OO1.11	Facilitate greater commercial iwi involvement in the management of the hoki fishery through the Deepwater Group Ltd from 2010
OO1.12	Utilise the collaborative relationships currently established between the Ministry of Fisheries and iwi groups to ensure iwi have the opportunity to effectively input and participate in the management of the hoki fishery from 2010

Management Objectives - Environment

MO2.1	Ensure hoki and key bycatch fish stocks are managed within an agreed harvest strategy
Status at start of plan	There is a harvest strategy in place for hoki but it has not yet been formally approved. There are no formal harvest strategies in place for key bycatch fisheries
Target status at 5 year review	○ Hoki and key bycatch stocks are managed either at or above agreed target levels or are managed to a level where it is clear that the stock is moving towards an agreed target ○ Harvest strategies, consistent with the Harvest Strategy Standard, are implemented for hoki and relevant bycatch stocks ○ The necessary data and information is available to regularly assess performance against agreed biological reference points ○ All hoki and key bycatch stocks are managed within appropriate and agreed harvest strategies that would achieve rapid recovery if stocks approach or fall below limit reference points
Supporting operational objectives	
OO1.2	Enable quota owners to develop and implement a harvest regime to maximise economic yield from the hoki fishery which is aligned with the harvest strategy by 2011
OO2.1	Develop an agreed harvest strategy for the hoki fishery that includes a rebuild strategy and is consistent with the Harvest Strategy Standard by end of 2010
OO2.2	Ensure that the total harvest of hoki and key bycatch species is balanced against ACE and that overcatch of the TACC is minimised
OO2.3	Annually assess status of the hoki stocks and manage harvest levels in line with the harvest strategy from 2011
OO2.4	Develop and implement an agreed harvest strategy (consistent with the Harvest Strategy Standard) for key QMS bycatch stocks managed through this plan from 2011
OO2.5	Implement an effective annual in-season management regime to support the delivery of the harvest strategies for hoki (by 2010) and key bycatch stocks (post 2011)

MO2.2	Maintain the genetic diversity of hoki and key bycatch fish stocks
Status at start of plan	High-level information is available on the population structure of the hoki fishery but there is currently little reliable information available on the population structure of the key bycatch stocks managed through this plan
Target status at 5 year review	Information is available on sex and age class structure for hoki and key bycatch stocks and management measures ensure the maintenance of sub-stocks in all areas of their distribution
Supporting operational objectives	
OO1.2	Enable quota owners to develop and implement a harvest regime to maximise economic yield from the hoki fishery which is aligned with the harvest strategy by 2011
OO1.5	Ensure that all research used to inform the management of the hoki fishery continues to be peer reviewed and meets the requirement of the research standard
OO1.6	Ensure sufficient and appropriate data is routinely collected from the hoki fishery and key bycatch stocks to meet the requirements of the operational objectives specified in this plan from 2011
OO2.1	Develop an agreed harvest strategy for the hoki fishery that includes a rebuild strategy and is consistent with the Harvest Strategy Standard by end of 2010
OO2.2	Ensure that the total harvest of hoki and key bycatch species is balanced against ACE and that overcatch of the TACC is minimised
OO2.4	Develop and implement an agreed harvest strategy (consistent with the Harvest Strategy Standard) for key QMS bycatch stocks managed through this plan from 2011
OO2.5	Implement an effective annual in-season management regime to support the delivery of the harvest strategies for hoki (by 2010) and key bycatch stocks (post 2011)
OO2.8	Define what is meant by 'habitats of particular significance for fisheries management purposes' for the hoki fishery by 2010; identify the range of habitats that are significant, and review current levels of protection by 2013
OO2.9	Identify what further levels of habitat protection are required to be implemented by 2013

MO2.3	Protect hoki habitats of particular significance for fisheries management
Status at start of plan	There is no comprehensive definition of what is a habitat of particular significance for the management of the hoki fishery. However there are areas in the EEZ which have already been identified as appearing important to juvenile hoki. Non-regulatory measures are in place to limit fishing activity in these areas
Target status at 5 year review	○ Policy definition available which describes what is meant by 'habitats of particular significance for fisheries management' ○ Hoki habitats of particular significance to fisheries management have been identified ○ Where necessary, management measures to further protect these habitats have been developed and implemented

Supporting operational objectives	
OO1.5	Ensure that all research used to inform the management of the hoki fishery continues to be peer reviewed and meets the requirement of the research standard
OO1.6	Ensure sufficient and appropriate data is routinely collected from the hoki fishery and key bycatch stocks to meet the requirements of the operational objectives specified in this plan from 2011
OO2.6	Complete an Ecological Risk Assessment (ERA) to assess the level of risk from hoki fishing activity to non-fish species, including ETP species, by 2010
OO2.7	Determine additional management measures required to mitigate adverse effects on non-fish species, including ETP species, identified through the ERA by 2011
OO2.9	Identify what further levels of habitat protection are required to be implemented by 2013

MO2.4	Identify and avoid or minimise adverse effects of hoki fishing activity on incidental bycatch species
Status at start of plan	Incidental bycatch species information is recorded regularly by observers but is infrequently monitored or assessed. 94% of the catch in hoki target trawls is from QMS species and 6% is incidental bycatch species. It is not known if current bycatch levels adversely affect incidental bycatch species
Target status at 5 year review	○ Incidental bycatch from the hoki fishery is monitored annually. ○ Results of the ERA process ensure the high risk bycatch stocks are identified and harvest trends are assessed annually ○ Action is taken when bycatch levels for a particular species are considered to be adverse – this may include QMS entry
Supporting operational objectives	
OO2.6	Complete an Ecological Risk Assessment (ERA) to assess the level of risk from hoki fishing activity to non-fish species including ETP species by 2010
OO2.7	Determine additional management measures required to mitigate adverse effects on non-fish species, including ETP species, identified through the ERA by 2011
OO2.9	Identify what further levels of habitat protection are required to be implemented by 2013
OO2.13	Implement measures to monitor and improve vessel at-sea performance in terms of environmental interactions from 2010
OO2.14	Monitor trends in captures of incidental bycatch species in the hoki fishery from 2010

MO2.5	Manage the hoki fishery so as to avoid or minimise adverse effects on the long-term viability of endangered, threatened and protected species
Status at start of plan	○ The hoki trawl fishery is known to interact with ETP species such as seabirds, marine mammals and protected shark species. While levels of interaction are well documented on observed vessels the full extent of impacts on ETP species across the whole fishery and the subsequent risk to populations is not fully known ○ Seabird interactions are managed through both regulation and non-

	mandatory measures while marine mammal interactions are managed through non-mandatory measures. ○ There are currently no management measures in place to mitigate interactions with protected shark species
Target status at 5 year review	○ Robust information available on actual incidental interactions with ETP species from all hoki vessels ○ The ecological risk assessment (ERA) will have assessed the nature and extent of the impact of the hoki fishery on ETP species and where this impact is adverse, management measures are in place to avoid or minimise the impact ○ All ETP species interactions in the hoki fishery are managed to agreed standards or in the absence of standards to a level that will allow for continuous improvement
Supporting operational objectives	
OO2.6	Complete an Ecological Risk Assessment (ERA) to assess the level of risk from hoki fishing activity to non-fish species, including ETP species, by 2010
OO2.7	Determine additional management measures required to mitigate adverse effects on non-fish species, including ETP species, identified through the ERA by 2011
OO2.9	Identify what further levels of habitat protection are required to be implemented by 2013
OO2.10	Ensure that incidental seabird mortalities in the hoki fishery are avoided and minimised to acceptable levels (which may include standards) by 2011
OO2.11	Ensure that incidental marine mammal captures in the hoki fishery are avoided and minimised to acceptable levels (which may include standards) by 2012
OO2.12	Ensure that the incidental capture of endangered and protected shark captures in the hoki fishery are avoided and minimised to acceptable levels (which may include agreed standards) by 2013
OO2.13	Implement measures to monitor and improve vessel at-sea performance in terms of environmental interactions from 2010

MO2.6	**Manage hoki and key bycatch fisheries to avoid or minimise adverse effects on biological diversity**
Status at start of plan	Research and information on the full extent of adverse interactions on the biological diversity of the aquatic environment, including trophic relationships, due to hoki trawl activity is limited
Target status at 5 year review	○ Quantitative information is available on the position and importance of hoki and key bycatch species within the food web at key life stages ○ The ERA has identified adverse effects on biological diversity ○ Management measures are in either in place, or under development, to avoid or minimise adverse effects on biological diversity of the aquatic environment
Supporting operational objectives	
OO1.9	Monitor levels of fisher compliance in the hoki fishery annually against a set of agreed compliance standards and benchmarks, from 2010
OO1.10	Ensure appropriate and transparent action is taken when compliance

	levels in the hoki fishery fall below the agreed benchmarks, from 2011
OO2.2	Ensure that the total harvest of hoki and key bycatch species is balanced against ACE and that overcatch of the TACC is minimised
OO2.6	Complete an Ecological Risk Assessment (ERA) to assess the level of risk from hoki fishing activity to non-fish species, including ETP species, by 2010
OO2.7	Determine additional management measures required to mitigate adverse effects on non-fish species, including ETP species, identified through the ERA by 2011
OO2.9	Identify what further levels of habitat protection are required to be implemented by 2013
OO2.13	Implement measures to monitor and improve vessel at-sea performance in terms of environmental interactions from 2010

MO2.7	**Manage effects from the impact of hoki fishing activity on the benthic habitat using a spatial management approach.**
Status at start of plan	Benthic Protection Areas and Seamount Closures are in place and protect 11% of the hoki habitat based on depth range
Target status at 5 year review	○ Assessment completed of whether existing protection of benthic habitat is appropriate ○ Variations to existing spatial protection implemented as appropriate on the basis of this assessment
Supporting operational objectives	
OO2.6	Complete an Ecological Risk Assessment (ERA) to assess the level of risk from hoki fishing activity to non-fish species, including ETP species, by 2010
OO2.7	Determine additional management measures required to mitigate adverse effects on non-fish species, including ETP species, identified through the ERA by 2011
OO2.9	Identify what further levels of habitat protection are required to be implemented by 2013
OO2.15	Implement appropriate spatial management measures to address the impact that hoki bottom trawl fishing activity has on the benthic habitat, post 2013

Operational Objectives: Performance indicators

A performance indicator provides information (either qualitative or quantitative) on the extent to which an operational or management objective is achieving its outcomes.

Operational objectives should be SMART (specific, measurable, achievable, realistic and timely). The choice of performance indicator should ensure that evaluating progress towards achievement is possible – the outcome should be measurable and it should be possible to make comparisons with a previous point in time.

Individual tasks to support the operational objectives will be specified in the Annual Operational Plan.

The performance indicators described below are primarily output based which means that progress towards meeting the operational objectives will be assessed through the completion of a suite of tasks or actions supported by the delivery of agreed services.

These performance indicators provide only an **expectation** of what will be delivered through the fisheries plan rather than **confirmation** that the tasks associated with these operational objectives will be delivered in the time frame proposed. Actual tasks, including required resources and timeframes, will be described in the Annual Operational Plan. The performance indicators described below will be reported against in the Annual Review Report.

Operational objectives – Utilisation Performance Indicators

MO1.1	**OO1.1**	**Support the hoki fishery in maintaining MSC certification and achieving recertification after 2012**
	1	Hoki fishery successfully completes the annual surveillance audit during 2010 and 2011
	2	Hoki fishery is successfully recertified by an independent third party after 2012
MO1.1	**OO1.2**	**Enable quota owners to develop and implement a harvest regime to maximise economic yield from the hoki fishery by 2011**
	1	Agreed programme to maximise economic yield which is consistent with the harvest strategy standard is developed by hoki quota owners by 2011
	2	Maximum economic yield programme is an integral component of the hoki harvest strategy from 2011
MO1.1	**OO1.3**	**Ensure management measures and controls are assessed in terms of their contribution to the value of the hoki fishery before implementation from 2011**
	1	Cost benefit evaluation process developed during 2010-11 for all management decisions relevant to hoki
	2	Evaluation process implemented from 2011-12

MO1.2 MO1.4 MO1.6	**OO 1.4**	**Establish an open, transparent and inclusive management environment through: (1) ensuring all management information is available and easily accessible by all; and (2) collaboratively engaging with stakeholders on the management of the fishery by 2011**
	1	Annual Operational Plan published on the MFish website in July each year - starting in 2011
	2	Annual Review Report published on the MFish website in November each year – starting in 2011
	3	Revised MOU in place by end of 2010
	4	Environmental Advisory Group established by end of 2010
	5	Relevant stakeholders are provided with an opportunity to input into and review both the Annual Operational Plan and the Annual Review Report before they are finalised
MO1.5	**OO1.5**	**Ensure that all research used to inform the management of the hoki fishery continues to be peer reviewed and meets the requirement of the research standard**
	1	All research delivered as part of the 10 Year Research Programme meets the agreed MFish research standards and is independently peer reviewed through the MFish working group process
MO1.6	**OO1.6**	**Ensure sufficient and appropriate data is routinely collected from the hoki fishery and key bycatch stocks to meet the requirements of the operational objectives specified in this plan from 2011**
	1	The 10 Year Research Programme drives the data collection needs for the hoki fishery from 2010.
	2	Increased observer coverage across the deepwater fleet scaled up from 2010
MO1.6	**OO1.7**	**Create an 'information hub' where all information on the management of the hoki fishery is available and easily accessible by all, by 2011**
	1	MFish website is the 'go-to' site for the public and media for full information on the management of the hoki fishery and key bycatch stocks from December 2011
	2	Information on the agreed management approach for the hoki fishery and performance against the agreed management approach will be reported annually in the Annual Operational Plan and the Annual Review Report respectively
MO1.5	**OO1.8**	**Explore options to assess the management of the hoki fishery against international best practice standards and guidelines from 2011**
	1	Report prepared on the performance of the hoki fishery, including gap analysis, by 2013.
	2	Hoki fishery is successfully recertified by the MSC after 2012

MO1.5	**OO1.9**	**Monitor levels of fisher compliance in the hoki fishery annually against a set of agreed compliance standards and benchmarks from 2010**
	1	Performance of the hoki fishery is assessed against a comprehensive set of compliance benchmarks from 2010
MO1.5	**OO1.10**	**Ensure appropriate and transparent action is taken when compliance levels in the hoki fishery fall below the agreed benchmarks from 2012**
	1	MFish Field Operations reports annually on actions taken against operators and quota owners engaged in non-compliant activity across all deepwater fisheries, including hoki – this information, and subsequent enforcement actions, is summarised in the Annual Review Report from December 2011
MO1.7	**OO1.11**	**Facilitate greater commercial iwi involvement in the management of the hoki fishery through the Deepwater Group Ltd from 2010**
	1	Improved iwi participation in management issues is apparent from increased iwi representation on the DWG. Target of 70% of iwi groups are represented either directly or indirectly by the DWG from 2013
MO1.7	**OO1.12**	**Utilise the collaborative relationships currently established between the Ministry of Fisheries and iwi groups to ensure iwi have the opportunity to effectively input and participate in the management of the hoki fishery from 2010**
	1	Annual Operational Plans and Annual Review Reports are presented to relevant iwi forums to provide for input into the prioritisation of tasks and services to support the delivery of fishery specific objectives in the first instance and, the delivery of objectives specified in Iwi Fish Plans over time

Operational objectives –Environment Performance indicators

MO2.1	**OO2.1**	**Develop an agreed harvest strategy for the hoki fishery that includes a rebuild strategy and is consistent with the Harvest Strategy Standard by end of 2010**
	1	An agreed rebuild strategy for the hoki fishery is in place by end of 2010
	2	Details of the rebuild strategy are publicly available
	3	The rebuild strategy drives the management response if either the western or eastern hoki stocks breaches the soft target
MO2.1 MO2.2	**OO2.2**	**Ensure that the total harvest of hoki and key bycatch species is balanced against ACE and that overcatch of the TACC is minimised**
	1	Performance of the hoki fishery and key bycatch species against the TACC is assessed annually
	2	Deemed value rates are reviewed annually and where appropriate are amended so as to provide an incentive to cover catch with ACE
MO2.1	**OO2.3**	**Annually assess status of hoki stocks and manage harvest levels in line with the harvest strategy from 2011**
	1	The status of the hoki fishery is assessed annually against the harvest strategy starting with the 2011 assessment and this information is recorded in the stock assessment plenary report
	2	The result of the annual assessment drives the management response around sustainable catch limits
MO2.1	**OO2.4**	**Develop and implement an agreed harvest strategy (consistent with the Harvest Strategy Standard) for key QMS bycatch stocks managed through this plan from 2011**[10]
	1	An approved harvest strategy is available to guide the management of silver warehou from 2011-2012 fishing year
	2	An approved harvest strategy is available to guide the management of white warehou from 2012-2013
	3	Alternative management strategies will be developed for the remaining bycatch stocks as information becomes available through the 10 Year Research Programme with an expectation that all species will have a documented management approach by 2014

[10] Note that the management of hake and ling which are also caught as a bycatch in the hoki fishery is addressed through separate chapters on each of these species.

MO2.5	**OO2.5**	**Implement an effective annual in-season management regime to support the delivery of the harvest strategies for hoki (from 2010) and key bycatch stocks (post 2011)**
	1	A formalised and agreed in-season management regime to support the hoki harvest strategy is implemented during 2010-2011 which includes measures to manage the agreed catch limits within the TACC
	2	The in-season management regime is reviewed annually and amendments are recorded in the Annual Operational Plan and performance of this fishery is recorded in the Annual Review Report
	3	Where necessary, a formalised and agreed in-season management regime to support the management approach for key bycatch stocks is implemented for the 2012-2013 fishing year
	4	In-season management regimes for key bycatch stocks, where appropriate, are reviewed annually and amendments are recorded in the Annual Operational Plan and performance is recorded in the Annual Review Report
MO2.3 MO2.4 MO2.5 MO2.6 MO2.7	**OO2.6**	**Complete an Ecological Risk Assessment (ERA) to assess the level of risk from hoki fishing activity to non-fish species, including ETP species, by 2010**
	1	Final ERA report available by end of 2010
MO2.3 MO2.4 MO2.5 MO2.6 MO2.7	**OO2.7**	**Determine additional management measures required to mitigate adverse effects on non-fish species, including ETP species, identified through the ERA by 2011**
	1	Final report available on additional management measures required by October 2012
	2	Description of proposed implementation approach and timeframe is available for the start of the 2012-2013 fishing year
MO2.3	**OO2.8**	**Define what is meant by 'habitats of particular significance for fisheries management purposes' for the hoki fishery by 2010; identify the range of habitats that are significant, and review current levels of protection by 2013**
	1	Policy definition produced during 2011-12 detailing what is encompassed by habitats of particular significance and a possible mechanism to implement a protection regime
	2	Report produced describing the nature and extent of habitats of particular significance for hoki fisheries management purposes by 2013
	3	Agreed assessment of current level of protection made by 2013
MO2.3	**OO2.9**	**Identify what further levels of habitat protection are required to be implemented by 2013**
	1	Report specifying additional levels of habitat protection required for hoki fisheries management purposes available by 2014 for implementation during 2014-2015

MO2.5	**OO2.10**	**Ensure that incidental seabird mortalities in the hoki fishery are avoided and minimised to acceptable levels (which may include standards) by 2011**
	1	Continue to report annually on incidental seabird captures in the hoki fishery throughout the duration of the fisheries plan
	2	Performance of the hoki fishery assessed against the seabird standard once standard is available for implementation
	3	Additional management measures to ensure the fishery meets the agreed standard are implemented as required
	4	In the absence of standards a transparent and clearly demonstrated approach of continuous improvement to avoid and minimise seabird mortality is implemented from October 2011
MO2.5	**OO2.11**	**Ensure that incidental marine mammal captures in the hoki fishery are avoided and minimised to acceptable levels (which may include standards) by 2012**
	1	Continue to report annually on incidental marine mammal captures in the hoki fishery throughout the duration of the fisheries plan
	2	Impact of hoki fishery on ETP marine mammal species assessed by 2012 – risk will be determined by the ERA
	3	In the absence of standards a transparent and clearly demonstrated approach of continuous improvement is implemented from October 2011
	4	If standards are developed for any marine mammal species then the performance of the hoki fishery will be assessed against such standards. If the hoki fishery fails to meet the standard then additional management measures will be implemented
MO2.5	**OO2.12**	**Ensure that the incidental capture of endangered and protected shark captures in the hoki fishery are avoided and minimised to acceptable levels (which may include agreed standards) by 2013**
	1	Implement a monitoring regime to accurately record endangered and protected shark species interactions in the hoki fishery by October 2010
	2	Assess current status of high-risk shark species populations by October 2013 – risk will be determined by the ERA
	3	In the absence of standards a transparent and clearly demonstrated approach of continuous improvement is implemented from October 2013
	4	If standards are developed for any shark species then the performance of the hoki fishery will be assessed against such standards. If the hoki fishery fails to meet the standard then additional management measures will be implemented
MO1.2	**OO2.13**	**Implement measures to monitor and improve vessel at-sea performance in terms of environmental interactions from 2010**
	1	Review and amend, as appropriate available measures to monitor and improve at-sea vessel performance in terms of compliance with non-regulatory management measures by end of 2010
	2	Report on at-sea vessel performance annually through the Annual Review Report and apply further management interventions where performance issues indicate this is necessary

MO2.4	**OO2.14**	**Monitor trends in captures of incidental bycatch species in the hoki fishery, from 2010**
	1	Report produced annually on extent of captures of incidental bycatch species from observed vessels operating in the hoki fishery from end of 2010 and information summarised in the Annual Review Report
	2	Level 1 Risk Assessment completed for all deepwater and middle-depth incidental bycatch species by end of 2011-2012
MO2.7	**OO2.15**	**Implement appropriate spatial management measures to address the impact that hoki bottom trawl fishing activity has on the benthic habitat, post 2013**
	1	Maps of hoki trawl footprint produced annually from 2010-2011 fishing year
	2	Extent of hoki trawl footprint formally assessed against Benthic Optimised Marine Environment Classification during 2011-2012
	3	Performance of the hoki fishery assessed against the Benthic Impact Standard once standard is available for implementation (estimated 2011).
	4	Additional programme of spatial management measures developed (if the assessment deems necessary) during 2012-2013
	5	Programme of implementation commences from 2013

Note that all operational objectives, and in turn the management objectives, contribute to the delivery of MO1.3 – "Ensure the deepwater and middle-depths fisheries resources are managed so as to provide for the reasonably foreseeable needs of future generations"